Operation Manual

steinberg

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This PDF provides improved access for vision-impaired users. Please note that due to the complexity and number of images in this document, it is not possible to include text descriptions of images.

Table of Contents

Introduction

About the Program Versions

The documentation covers two different operating systems, Windows and Mac OS X. Some features and settings are specific to one of the platforms.

This is clearly stated in the applicable cases. If nothing else is said, all descriptions and procedures in the documentation are valid for both Windows and Mac OS X.

The screenshots are taken from the Windows version of Nuendo with the Nuendo Expansion Kit (NEK).

Typographical Conventions

Many of the default key commands in Nuendo use modifier keys, some of which are different depending on the operating system. For example, the default key command for Undo is [Ctrl]-[Z] on Windows and [Command]-[Z] on Mac OS X.

When key commands with modifier keys are described in this manual, they are shown with the Windows modifier key first, in the following way:

- [Win modifier key]/[Mac modifier key]-[key]

For example, [Ctrl]/[Command]-[Z] means “press [Ctrl] on Windows or [Command] on Mac OS X, then press [Z]”.

Similarly, [Alt]/[Option]-[X] means “press [Alt] on Windows or [Option] on Mac OS X, then press [X]”.

NOTE

This manual often refers to right-clicking, for example, to open context menus. If you are using a Mac with a single-button mouse, hold down [Ctrl] and click.

Part I - Getting into the Details

Setting Up Your System

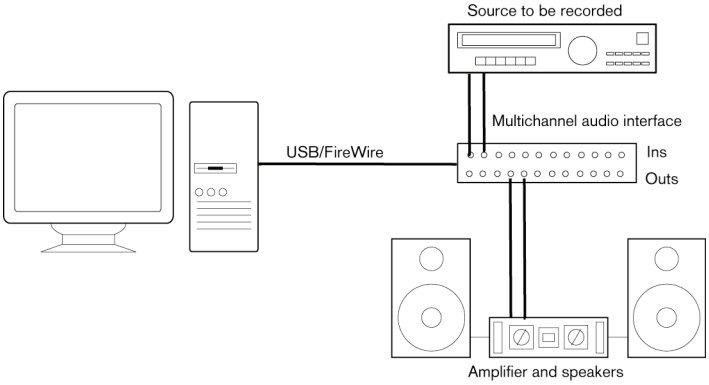
Setting Up Audio

IMPORTANT

Make sure that all equipment is turned off before making any connections.

Simple Stereo Input and Output Setup

If you only use a stereo input and output from Nuendo, you can connect your audio hardware, for example, the inputs of your audio card or your audio interface, directly to the input source and the outputs to a power amplifier and speaker.



Once you have set up the internal input and output busses, you can connect your audio source, for example a microphone, to your audio interface and start recording.

Connecting Audio

Your system setup depends on many different factors, for example, on the kind of project that you want to create, on the external equipment that you want to use, or on the computer hardware that is available to you. Therefore, the following sections can only serve as examples.

How to connect your equipment, that is, whether to use digital or analog connections also depends on your setup.

About Recording Levels and Inputs

When you connect your equipment, make sure that the impedance and levels of the audio sources and inputs are matched. Using the correct type of input is important to avoid distortion or noisy recordings. For microphones, for example, different inputs can be used, such as consumer line level (-10 dBV) or professional line level (+4 dBV).

Sometimes, you can adjust input characteristics on the audio interface or on its control panel. For details, refer to the documentation that came with the audio hardware.

IMPORTANT

Nuendo does not provide any input level adjustments for the signals that are coming into your audio hardware, since these are handled differently for each card. Adjusting input levels is either done in a special application that is included with the hardware or its control panel.

Word Clock Connections

If you are using a digital audio connection, you may also need a word clock connection between the audio hardware and external devices. For details, refer to the documentation that came with the audio hardware.

IMPORTANT

Set up word clock synchronization correctly, or you may experience clicks and crackles in your recordings.

Selecting a Driver

You must select the correct driver in Nuendo to make sure that the program can communicate with the audio hardware.

NOTE

On Windows operating systems, we recommend that you access your hardware via an ASIO driver developed specifically for the hardware. If no ASIO driver is installed, refer to your audio hardware manufacturer about available ASIO driver. You can use the Generic Low Latency ASIO driver if no specific ASIO driver is available.

When you start Nuendo, a dialog opens that prompts you to select a driver. You can also select your audio hardware driver in the following way.

PROCEDURE

1. Launch Nuendo and select **Devices > Devices Setup**.
2. In the devices list, select **VST Audio System**.

3. On the **ASIO Driver** menu, select your audio hardware driver.

   The selected driver is added to the devices list.

4. In the devices list, select the driver to open the driver settings for your audio hardware.

5. Open the control panel for the audio hardware in the following way:

   - On Windows operating systems, click the **Control Panel** button.
   - On Mac OS X operating systems, click the **Open Config App** button.

     This button is available only for some hardware products. If it is not available in your setup, refer to the documentation of your audio hardware for information on where to make hardware settings.

   NOTE

   The control panel is provided by the audio hardware manufacturer and is different for each audio card brand and model. However, control panels for the ASIO DirectX driver and the Generic Low Latency ASIO Driver (Windows only) are provided by Steinberg.

6. Make the settings as recommended by the audio hardware manufacturer.

7. Click **Apply**.

8. Click **OK**.

RELATED LINKS

Using Audio Hardware with a DirectX Driver (Windows only) on page 15

Using Audio Hardware with a DirectX Driver (Windows only)

A DirectX driver is an alternative to a specific ASIO driver and the Generic Low Latency ASIO driver.

Nuendo comes with the ASIO DirectX Full Duplex driver.

- To select the driver, select **Devices > Device Setup > VST Audio System** and open the **ASIO Driver** menu.

When the ASIO DirectX Full Duplex driver is selected, you can open **ASIO DirectX Full Duplex Driver** from the **Devices List**, and click **Control Panel** button. On the **Control Panel** for the driver, the following settings are available:

Direct Sound Output and Input Ports

Lists all available Direct Sound output and input ports. To activate/deactivate a port in the list, click the checkbox in the left column.

Buffer Size

Allows you to edit the buffer size. Audio buffers are used when audio data is transferred between Nuendo and the audio card. Larger buffers ensure that playback occurs without glitches, but larger buffers also increase the latency.

Offset

Allows you to adjust the output or input latency time, if a constant offset is audible during playback of audio and MIDI recordings.

Audio Channels

Lists the available audio channels.

Bits Per Sample

Shows the number of bits per sample.

Sync Reference

Shows if the driver is used as sync reference.

NOTE

To take advantage of DirectX Full Duplex driver, the audio hardware must support Windows Driver Model (WDM).

Using Hardware that is Based on an External Clock Source

For proper audio playback and recording, you must set the sample rate of the project to the sample rate of the incoming clock signals. If you are using an external clock source, Nuendo must be notified that it receives external clock signals and derives its speed from that source.

PROCEDURE

1. Select **Devices > Devices Setup**.
2. In the devices list, select the page of your audio hardware driver.
3. Activate **Externally clocked**.

RESULT

Nuendo accepts the sample rate mismatch, and playback is therefore faster or slower.

When a sample rate mismatch occurs, the **Record Format** field on the status line is highlighted in a different color.

Using Several Audio Applications Simultaneously

If you want to use several audio applications simultaneously, you must allow other applications to play back via your audio hardware even though Nuendo is running.

PROCEDURE

1. Select **Devices > Devices Setup**.
2. In the devices list, select the **VST Audio System** page.
3. Activate **Release Driver when Application is in Background**.

RESULT

The application that is currently active gets access to the audio hardware.

NOTE

Make sure that any other audio application accessing the audio hardware is also set to release the ASIO or Mac OS X driver.

Setting Up Busses

Nuendo uses a system of input and output busses to transfer audio between the program and the audio hardware.

- Input busses let you route audio from the inputs of your audio hardware into Nuendo. This means that audio is always recorded through one or several input busses.
- Output busses let you route audio from Nuendo to the outputs of your audio hardware. This means that audio is always played back through one or several output busses.

Once you understand the bus system and know how to set up the busses properly, you can continue with recording, playing back, mixing, and doing surround work.

RELATED LINKS

VST Connections on page 22

Configuring the Audio Hardware

Most audio cards provide one or more small applications that allow you to customize your hardware.

This includes:

- Selecting which inputs/outputs are active.
- Setting up word clock synchronization (if available).
- Turning on/off monitoring via the hardware.

- Setting levels for each input.
- Setting levels for the outputs so that they match the equipment that you use for monitoring.
- Selecting digital input and output formats.
- Making settings for the audio buffers.

In most cases, the settings for the audio hardware are gathered on a control panel that can be opened from within Nuendo or separately, when Nuendo is not running. For details, refer to the audio hardware documentation.

Plug and Play Support for ASIO Devices

The Steinberg UR824 hardware series supports plug and play in Nuendo. These devices can be plugged in and switched on while the application is running. Nuendo automatically uses the driver of the UR824 series and re-maps the VST connections accordingly.

Steinberg cannot guarantee that this works with other hardware. If you are unsure of whether your device supports plug and play, refer to the documentation of your device.

IMPORTANT

If a device that does not support plug and play is connected or disconnected while the computer is running, it can get damaged.

Setting Up the Input and Output Ports

Once you have selected the driver for your audio hardware and have set it up, you must specify which inputs and outputs to use.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Device Setup** dialog, select your driver from the **Devices** list on the left.
3. Make your settings.
4. Optional: To hide a port, click its **Visible** column.

   IMPORTANT

   Hiding a port disconnects it.

   Ports that are not visible cannot be selected in the **VST Connections** window where you set up your input and output busses.
5. Optional: To rename a port, click its name in the **Show as** column and type in a new name.
6. Click **OK**.

About Monitoring

In Nuendo, monitoring means listening to the input signal while preparing to record or while recording.

The following ways of monitoring are available.

- Externally by listening to the signal before it reaches Nuendo.
- Via Nuendo.
- By using ASIO Direct Monitoring.

  This is a combination of the other methods.

RELATED LINKS

External Monitoring on page 244
Monitoring via Nuendo on page 243
ASIO Direct Monitoring on page 244

Setting Up MIDI

IMPORTANT

Turn off all equipment before making any connections.

PROCEDURE

1. Connect your MIDI equipment (keyboard, MIDI interface, etc.) to your computer.
2. Install the drivers for your MIDI equipment.

RESULT

You can use your MIDI equipment in Nuendo.

About MIDI Ports

To play back and record MIDI data from your MIDI device, for example, a MIDI keyboard, you need to set up the MIDI ports in Nuendo.

Connect the MIDI output port of your MIDI device to the MIDI input port of your computer. This way, the MIDI device sends MIDI data to be played back or recorded inside your computer.

Connect the MIDI input port of your MIDI device to the MIDI output port of your computer. This way, you can send MIDI data from Nuendo to the MIDI device. For example, you can record your own playing, edit the MIDI data in Nuendo, and then play it back on the keyboard and record the audio that is coming out of the keyboard for a better edited performance.

Showing or Hiding MIDI Ports

You can specify if a MIDI port is listed on the MIDI pop-up menus in the program.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Device Setup** dialog, select **MIDI Port Setup** from the **Devices** list on the left.
3. To hide a MIDI port, deactivate its **Visible** column.
4. Click **OK**.

Setting Up All MIDI Inputs

When you record MIDI, you can specify which MIDI input each recording MIDI track should use. However, you can also record any MIDI data from any MIDI input. You can specify which inputs are included when you select **All MIDI Inputs** for a MIDI track.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Device Setup** dialog, select **MIDI Port Setup** from the **Devices** list on the left.
3. Activate **In 'All MIDI Inputs'** for a port.

   NOTE

   If you have a MIDI remote control unit connected, make sure to deactivate the **In 'All MIDI Inputs'** option for that MIDI input. This avoids accidental recording of data from the remote control when **All MIDI Inputs** is selected as input for a MIDI track.

4. Click **OK**.

RESULT

When you select **All MIDI Inputs** on the **Input Routing** menu of a MIDI track in the Inspector, the MIDI track uses all MIDI inputs that you specified in the **Device Setup** dialog.

Connecting a Synchronizer

When using Nuendo with external tape transports, you most likely must add a synchronizer to your system.

IMPORTANT

Make sure that all equipment is turned off before making any connections.

For information on how to connect and set up your synchronizer, refer to the documentation of your synchronizer.

RELATED LINKS

Synchronization on page 1061

Setting Up Video

Nuendo plays back video files in a number of formats, such as AVI, QuickTime, or MPEG. QuickTime is used as the playback engine. Which formats can be played back depends on the video codecs that are installed on your system.

There are several ways to play back video, for example, without any special hardware, using a FireWire port, or using dedicated video cards.

If you plan to use special video hardware, install it and set it up as recommended by the manufacturer.

NOTE

Before you use the video hardware with Nuendo, we recommend that you test the hardware installation with the utility applications that were provided with the hardware and/or the QuickTime Player application.

RELATED LINKS

Video on page 1100
Video Output Devices on page 1102

VST Connections

To play back and record in Nuendo, you must set up input and output busses in the **VST Connections** window. Here, you can also set up group and FX channels, external effects, external instruments, and the **Control Room**.

The bus types that you need depend on your audio hardware, on your general audio setup, for example your surround speaker setup, and on the projects that you use.

VST Connections Window

The **VST Connections** window allows you to set up input and output busses, group and FX channels, external effects, and external instruments. Furthermore, you can use this window to access and configure the **Control Room**.

- To open the **VST Connections** window, select **Devices > VST Connections**.

Inputs/Outputs Tab

The **Input** and **Output** tabs allow you to set up and configure input and output busses.

The following options are available above the bus list:

+- All

Expands/Collapses all busses in the bus list.

Add Bus

Opens the **Add Input Bus** dialog, where you can create a new bus configuration.

Presets

Opens the **Presets** menu, where you can select bus configuration presets. The **Store** button allows you to save a bus configuration as preset. The **Delete** button deletes the selected preset.

The following columns are available for the bus list:

Bus Name

Lists the busses. Click the name of a bus to select or rename it.

Speakers

Indicates the speaker configuration (mono, stereo, surround formats) of each bus.

Audio Device

Shows the currently selected ASIO driver.

Device Port

Shows which physical inputs/outputs on your audio hardware are used by the bus. Expand the bus entry to show all speaker channels. If the bus entry is collapsed, only the first port that is used by this bus is visible.

The **Device Port** pop-up menu displays how many busses are connected to a given port. The busses are shown in square brackets next to the port name.

Up to three bus assignments can be displayed in this way. If more connections have been made, this is indicated by a number at the end of the port name.

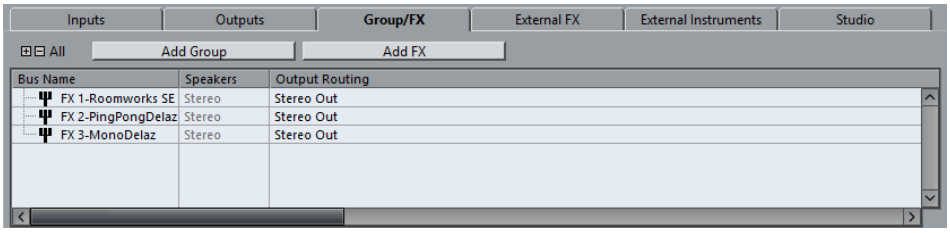
For example, “Adat 1 [Stereo1] [Stereo2] [Stereo3] (+2)” means that the Adat 1 port is already assigned to three stereo busses plus two additional busses.

Click (Outputs tab only)

You can route the metronome click to a specific output bus, regardless of the actual **Control Room** output, or even when the **Control Room** is disabled.

Group/FX Tab

This tab allows you to create group and FX channels/tracks and to make output assignments for these.



The following options are available above the bus list:

+- All

Expands/Collapses all busses in the bus list.

Add Group

Opens the **Add Group Channel Track** dialog, where you can create a new group channel track.

Add FX

Opens the **Add FX Channel Track** dialog, where you can create a new FX channel track.

The following columns are available for the bus list:

Bus Name

Lists the busses. Click the name of a bus to select or rename it.

Speakers

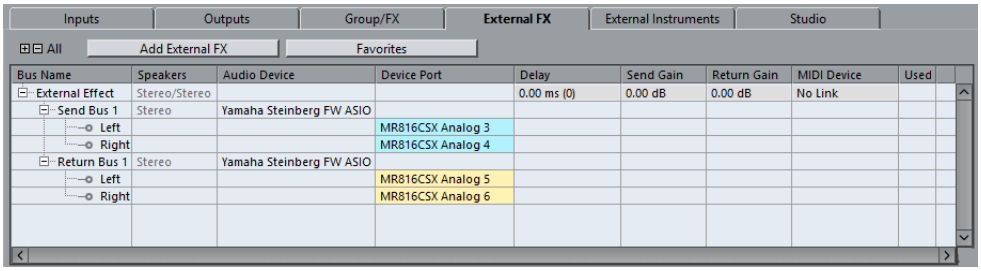
Indicates the speaker configuration (mono, stereo, surround formats) of each bus.

Output Routing

Lets you select the output routing for the corresponding bus.

External FX Tab

This tab allows you to create send effect or return busses. You can use these to connect external effects which can then be selected via the effect pop-up menus from inside the program.



The following options are available above the bus list:

+- All

Expands/Collapses all busses in the bus list.

Add External FX

Opens the **Add External FX** dialog, where you can configure a new external FX.

Favorites

Lets you store external effect configurations as favorites that you can recall.

The following columns are available for the bus list:

Bus Name

Lists the busses. Click the name of a bus to select or rename it.

Speakers

Indicates the speaker configuration (mono, stereo, surround formats) of each bus.

Audio Device

Shows the currently selected ASIO driver.

Device Port

Shows which physical inputs/outputs on your audio hardware are used by the bus. Expand the bus entry to show all speaker channels. If the bus entry is collapsed, only the first port that is used by this bus is visible.

The **Device Port** pop-up menu displays how many busses are connected to a given port. The busses are shown in square brackets next to the port name.

Up to three bus assignments can be displayed in this way. If more connections have been made, this is indicated by a number at the end of the port name.

For example, “Adat 1 [Stereo1] [Stereo2] [Stereo3] (+2)” means that the Adat 1 port is already assigned to three stereo busses plus two additional busses.

Delay

Allows you to enter a value to compensate for an inherent delay (latency) of your hardware effect device during playback. You can right-click the **Delay** column for the effect and select **Check User Delay** to automatically determine the delay value.

NOTE

The latency of the audio hardware is handled automatically by Nuendo.

Send Gain

Allows you to adjust the level of the signal that is sent to the external effect.

Return Gain

Allows you to adjust the level of the signal that the external effect sends.

NOTE

Excessive output levels from an external effect device can cause clipping in the audio hardware. You cannot use the **Return Gain** setting to compensate for this. You must lower the output level on the effect device instead.

MIDI Device

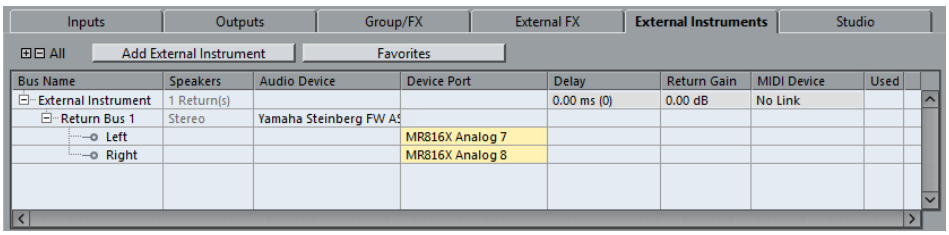
When you click in this column, a pop-up menu opens where you can disconnect the effect from the associated MIDI device, select a MIDI device, create a new device, or open the **MIDI Device Manager** to edit the MIDI device.

Used

Whenever you insert an external effect into an audio track, this column shows a checkmark (**x**) to indicate that the effect is being used.

External Instruments Tab

This tab allows you to create input/output busses that can be used to connect external instruments.



The following options are available above the bus list:

+- All

Expands/Collapses all busses in the bus list.

Add External Instrument

Opens the **Add External Instrument** dialog, where you can configure a new external instrument.

Favorites

Lets you store external instrument configurations as favorites that you can recall.

The following columns are available for the bus list:

Bus Name

Lists the busses. Click the name of a bus to select or rename it.

Speakers

Indicates the speaker configuration (mono, stereo, surround formats) of each bus.

Audio Device

Shows the currently selected ASIO driver.

Device Port

Shows which physical inputs/outputs on your audio hardware are used by the bus. Expand the bus entry to show all speaker channels. If the bus entry is collapsed, only the first port that is used by this bus is visible.

The **Device Port** pop-up menu displays how many busses are connected to a given port. The busses are shown in square brackets next to the port name.

Up to three bus assignments can be displayed in this way. If more connections have been made, this is indicated by a number at the end of the port name.

For example, “Adat 1 [Stereo1] [Stereo2] [Stereo3] (+2)” means that the Adat 1 port is already assigned to three stereo busses plus two additional busses.

Delay

Allows you to enter a value to compensate for an inherent delay (latency) of your hardware effect device during playback. You can right-click the **Delay** column for the instrument and select **Check User Delay** to automatically determine the delay value that is used for delay compensation.

NOTE

The latency of the audio hardware is handled automatically by Nuendo.

Return Gain

Allows you to adjust the level of the signal coming in from the external instrument.

NOTE

Excessive output levels from an external effect device can cause clipping in the audio hardware. The **Return Gain** setting cannot be used to compensate for this. You must lower the output level on the effect device instead.

MIDI Device

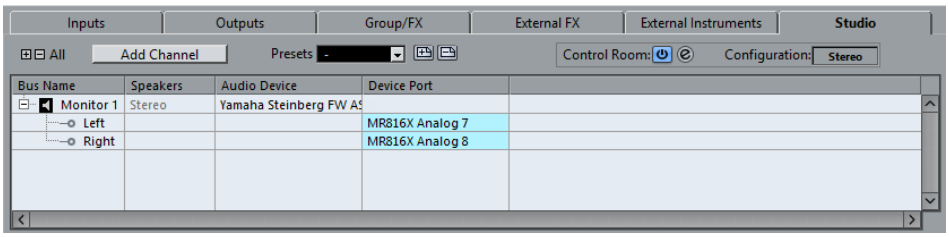
When you click in this column, a pop-up menu opens where you can disconnect the instrument from the associated MIDI device, select a MIDI device, create a new device, or open the **MIDI Device Manager** to edit the MIDI device.

Used

Whenever you insert the external instrument into a VST instrument slot, this column shows a checkmark (**x**) to indicate that the instrument is being used.

Studio Tab

This tab allows you to enable and configure the **Control Room**.



The following options are available above the bus list:

+- All

Expands/Collapses all busses in the bus list.

Add Channel

Opens a menu where you can select the type of channel that you want to add. You can add the following channels:

- External Input

- Talkback
- Cue
- Headphone
- Monitor

Presets

Opens the **Presets** menu, where you can select bus configuration presets. The **Store** button allows you to save a bus configuration as preset. The **Delete** button deletes the selected preset.

Control Room

Activates/Deactivates the **Control Room**.

Control Room Mixer

Opens the **Control Room Mixer** window, where you can set up the **Control Room**.

Configuration

Displays the selected channel configuration.

The following columns are available for the bus list:

Bus Name

Lists the busses. Click the name of a bus to select or rename it.

Speakers

Indicates the speaker configuration (mono, stereo, surround formats) of each bus.

Audio Device

Shows the currently selected ASIO driver.

Device Port

Shows which physical inputs/outputs on your audio hardware are used by the bus. Expand the bus entry to show all speaker channels. If the bus entry is collapsed, only the first port that is used by this bus is visible.

The **Device Port** pop-up menu displays how many busses are connected to a given port. The busses are shown in square brackets next to the port name.

Up to three bus assignments can be displayed in this way. If more connections have been made, this is indicated by a number at the end of the port name.

For example, “Adat 1 [Stereo1] [Stereo2] [Stereo3] (+2)” means that the Adat 1 port is already assigned to three stereo busses plus two additional busses.

RELATED LINKS

Control Room on page 414

Renaming the Hardware Inputs and Outputs

Before you set up busses, you should rename the default inputs and outputs of your audio hardware. This allows transferring projects between different computers and setups.

For example, if you move your project to another studio, the audio hardware may be of a different model. But if you and the other studio owner have agreed on identical names for your inputs and outputs, Nuendo corrects inputs and outputs for your busses.

NOTE

If you open a project that was created on another computer and the port names do not match or the port configuration is not the same, the **Missing Ports** dialog appears. This allows you to manually re-route ports that are used in the project to ports that are available on your computer.

PROCEDURE

1. Select **Devices > Device Setup**.
2. On the **VST Audio System** page, make sure that the correct driver for your audio hardware is selected.

   If this is the case, your audio card is listed in the **Devices** list on the left of the **Device Setup** window.
3. In the devices list, select your audio card.

   The available input and output ports on your audio hardware are listed on the right.
4. In the **Show As** column, click on a port name and enter a new name.
5. Repeat the previous step until you have renamed all required ports.
6. Click **OK**.

RELATED LINKS

Re-Routing Missing Ports on page 80

Hiding Ports

You can hide ports that you are not using. Hidden ports are not displayed in the **VST Connections** window.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the devices list, select your audio card.
3. In the **Visible** column, deactivate the ports that you want to hide.
4. Click **OK**.

Activating and Deactivating Ports (Mac only)

On Mac operating systems, you can specify which input and output ports are active. This allows you to use the microphone input instead of the line input or to deactivate the audio card input or output.

NOTE

This function is only available for built-in audio, standard USB audio devices, and a certain number of other audio cards.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the devices list, select your audio card.
3. Click the **Control Panel** button.
4. Activate/Deactivate ports.
5. Click **OK**.

Adding Input and Output Busses

PROCEDURE

1. In the **VST Connections** dialog, click the **Inputs** or **Outputs** tab.
2. Click **Add Bus**.
   The **Add Input Bus** dialog opens.
3. Configure the bus.
4. Optional: Enter a name for the bus.
   If you do not specify a name, the bus is named according to the channel configuration.
5. Click **Add Bus**.
   The new bus is added to the bus list.
6. For each of the speaker channels in the bus, click in the **Device Port** column and select a port of your audio hardware.

Setting the Default Output Bus (Main Mix)

The **Main Mix** is the default output bus to which each new audio, group, or FX channel is automatically routed. If only one bus is available, this bus is automatically used as the default output bus.

PREREQUISITE

Add an output bus.

PROCEDURE

1. In the **VST Connections** dialog, right-click the output bus that you want to use as default output bus.
2. Select **Set <bus name> as Main Mix**.

RESULT

The selected bus is used as default bus. The **Main Mix** is indicated by a speaker icon next to its name.

Adding Child Busses

Child busses allow you to route tracks to particular channels within a bus.

For example, you can route a stereo track to a stereo channel pair within a surround bus. Or you can record a stereo channel pair in the surround bus to a separate stereo track.

PROCEDURE

1. On the **Inputs** tab, **Outputs** tab, or **Group/FX** tab, right-click a surround bus.
2. Click **Add Child Bus** and select a channel configuration.

RESULT

The child bus is created and can be used for routing.

Presets for Input and Output Busses

For input and output bus configurations, you can use different kinds of presets.

- A number of standard bus configurations.

- Automatically created presets tailored to your specific hardware configuration.

  On startup, Nuendo analyzes the physical inputs and outputs that are provided by your audio hardware and creates a number of hardware-dependent presets.

- Your own presets.

NOTE

You can create default presets for input and output bus configurations. If you create a new empty project, these default presets are applied. To create default presets, save your preferred input and output bus configurations under the name `Default`. If you have not defined default presets, the last used input and output bus configuration is applied when creating a new empty project.

Saving a Bus Configuration Preset

You can save your own input and output bus configuration and the studio configuration as presets.

PROCEDURE

1. Select **Devices > VST Connections**.
2. Set up your bus configuration.
3. Click **Store** .

   The **Type in Preset Name** dialog opens.
4. Enter a name.
5. Click **OK**.

RESULT

The preset is available in the **Presets** menu.

Deleting a Bus Configuration Preset

PROCEDURE

1. Select **Devices > VST Connections**.
2. From the **Presets** menu, select the preset that you want to delete.
3. Click **Delete** .

RESULT

The preset is deleted.

Adding Group and FX Channels

Group channels and FX channels allow you to group bus configurations.

Adding group and FX channels in the **VST Connections** window is identical to creating group channel tracks or FX channel tracks in the **Project** window.

PROCEDURE

1. In the **VST Connections** dialog, click the **Group/FX** tab.
2. Do one of the following:
   - To create a group channel, click **Add Group**.
   - To create an FX channel, click **Add FX**.
3. Configure the channel.
4. Optional: Enter a name for the group channel track.
5. Click **Add Track**.
   The group channel or FX channel is added to the bus list.
6. For each of the speaker channels in the bus, click in the **Output Routing** column and select a port of your audio hardware.

RELATED LINKS

Audio Effects on page 439

About Monitoring

In the **VST Connections** window, you can set up the busses that are used for monitoring, activate/deactivate the **Control Room**, and open the **Control Room Mixer**.

When the **Control Room** is disabled on the **Studio** tab of the **VST Connections** window, the **Main Mix** bus is used for monitoring. In this case, you can adjust the monitoring level in the **MixConsole**.

RELATED LINKS

Control Room on page 414
MixConsole on page 351

External Instruments and Effects

You can integrate external effect devices and external instruments, for example, hardware synthesizers, into the sequencer signal flow.

Requirements

- To use external effects, you need audio hardware with multiple inputs and outputs.

  An external effect requires at least one input and one output or input/output pairs for stereo effects in addition to the input/output ports that you use for recording and monitoring.

- To use external instruments, a MIDI interface must be connected to your computer.
- Audio hardware with low-latency drivers.

  Nuendo compensates for the input/output latency and ensures that the audio that is processed through external effects is not shifted in time.

Connecting an External Instrument/Effect

PREREQUISITE

The hardware device has stereo inputs and outputs.

PROCEDURE

1. Connect an unused output pair on your audio hardware to the input pair on your external hardware device.
2. Connect an unused input pair on your audio hardware to the output pair on your hardware device.

   IMPORTANT

   If you select input/output ports for external instruments/effects that are already used, the existing port assignment breaks without warning.

AFTER COMPLETING THIS TASK

Once the external device is connected to the audio hardware of your computer, you must set up the input/output busses in Nuendo.

Setting Up External Effects

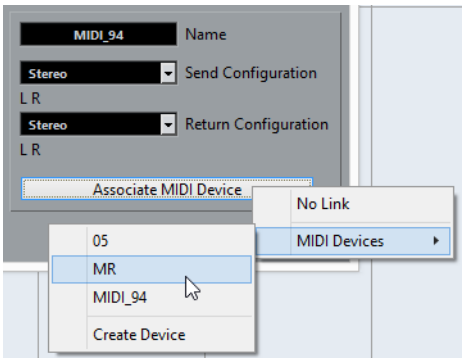
PROCEDURE

1. In the **VST Connections** window, click the **External FX** tab.
2. Click **Add External FX**.

3. In the **Add External FX** dialog, enter a name for the external effect and specify the send and return configurations.

   Depending on the type of effect, you can specify mono, stereo, or surround configurations.

4. Click **Associate MIDI Device** and select a MIDI device.



   You can also select **MIDI Devices > Create Device** and create a new MIDI device association.

   NOTE

   Delay compensation is only applied for the effect when you use MIDI devices.

5. Click **OK**.

   This adds a new external FX bus.

6. Click in the **Device Port** column for the left and right ports of the send bus and select the outputs of your audio hardware that you want to use.

7. Click in the **Device Port** column for the left and right ports of the return bus and select the inputs of your audio hardware that you want to use.

8. Make additional settings for the bus.

   You can also adjust the settings while using the external effect. This allows you to hear the result.

RELATED LINKS

Using MIDI devices on page 751
Delay Compensation on page 701

Adding External Effects

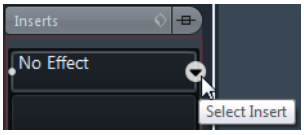
You can use the external FX bus as an insert effect or as a send effect, which is an insert effect on an FX channel track.

PREREQUISITE

Set up your external effects in the **VST Connections** window.

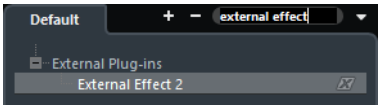
PROCEDURE

1. In the **Inspector**, open the **Inserts** panel.
2. Open the **Select Insert** menu.



3. Select an external effect from the **External Plug-ins** submenu.

   External effects are indicated by an **x** icon in the list next to their names in the **Select Insert** pop-up menu.



RESULT

The external FX bus is loaded into the effect slot.

A parameter window opens, showing the Delay, Send Gain, and Return Gain settings for the external FX bus. You can adjust these settings while playing back.

The audio signal from the channel is sent to the outputs on the audio hardware, through your external effect device, and back to the program via the inputs on the audio hardware.

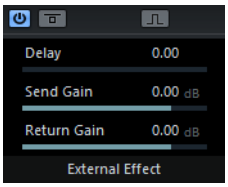
RELATED LINKS

Setting Up External Effects on page 34

External Effect Parameter Window

This window allows you to make delay and gain settings for the selected external effect.

When you select an external effect from the **Select Insert** menu in the **Inspector**, the **External Effect Parameter** window opens.



Activate Effect

Activates/Deactivates the external effect.

Bypass Effect

Allows you to bypass the external effect.

Measure Effect's Loop Delay for Delay Compensation

If this option is activated, Nuendo automatically determines the delay value that is used for delay compensation. This is the same function as the **Check User Delay** option in the **VST Connections** window.

When you have defined a MIDI device for the effect, the corresponding device window opens.

Delay

Allows you to adjust the delay for the external effect.

Send Gain

Allows you to adjust the send gain for the external effect.

Return Gain

Allows you to adjust the return gain for the external effect.

Setting Up External Instruments

PROCEDURE

1. In the **VST Connections** window, click the **External Instruments** tab.
2. Click **Add External Instrument**.
3. In the **Add External Instrument** dialog, enter a name for the external instrument and specify the number of required mono and/or stereo returns.

   Depending on the type of instrument, a specific number of mono and/or stereo return channels is required.
4. Click the **Associate MIDI Device** button and select a MIDI device.
5. Click **OK**.

   This adds a new external instrument bus.
6. Click in the **Device Port** column for the left and right ports of the return bus and select the inputs of your audio hardware to which you connected the external instrument.
7. Make additional settings for the bus.

   You can also adjust the settings while using the external instrument. This allows you to hear the result.

RELATED LINKS

Using MIDI devices on page 751

Adding External Instruments

PREREQUISITE

Set up your external instruments in the **VST Connections** window.

PROCEDURE

1. Select **Devices > VST Instruments**.

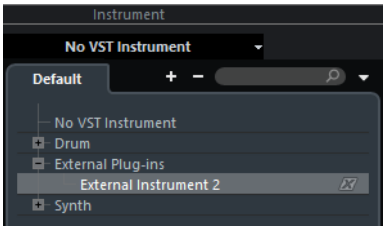
   The **VST Instruments** window opens.

2. Click **Add Track Instrument** .

   The **Add Instrument Track** window opens.

3. Select an external instrument from the **Instrument** pop-up menu.

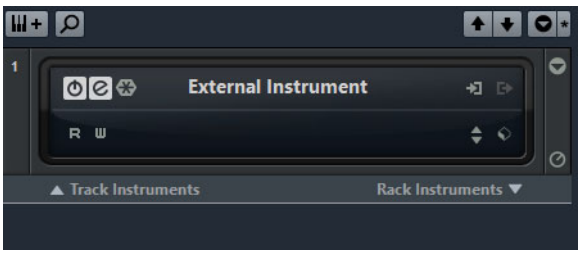
   External instruments are indicated by an **x** icon in the list next to their names in the **Instrument** pop-up menu.



4. Click **Add Track**.

RESULT

The external instrument is added to the VST instruments list.

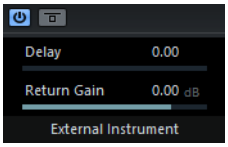


A parameter window for the external instrument opens. This can either be the device window, that allows you to create a generic device panel, an OPT editor window, or a default editor.

External Instruments Parameter Window

This window allows you to make delay and gain settings for the selected external instrument.

When you select an external instrument in the **VST Instruments** window, the **External Instrument Parameter Window** opens.



Activate External Instrument

Activates/Deactivates the external instrument.

Bypass External Instrument

Allows you to bypass the external instrument.

Delay

Allows you to adjust the delay for the external instrument.

Return Gain

Allows you to adjust the return gain for the external instrument.

Sending MIDI Notes to External Instruments

PREREQUISITE

Set up your external instruments in the **VST Connections** window and add a MIDI track.

PROCEDURE

1. In the **Inspector**, open the **Output Routing** pop-up menu for the corresponding MIDI track.
2. Select the MIDI device to which the external instrument is connected.

RESULT

The instrument plays any MIDI notes that it receives from the track and returns them to Nuendo through the return channels that you have set up. Delay compensation is used.

The external instrument behaves like any other VST instrument in Nuendo.

RELATED LINKS

Delay Compensation on page 701

Saving External Instrument and Effect Configurations as Favorites

You can save external instruments and external effects as favorites. Favorites are device configurations that you can recall. They also allow you to save different configurations for the same device, for example, a multi-effect board or an effect that provides both a mono and a stereo mode.

You can save and restore the favorites in the **External Instruments** and **External FX** tabs of the **VST Connections** window.

- To save an external instrument or effect configuration as a favorite, select the **Bus Name**, click **Favorites**, and select **Add Selected Effect <effect name> to Favorites**.

- To recall a favorite, click **Favorites** and select the configuration that you want to recall.

Freezing External Instruments/Effects

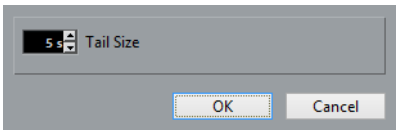
You can freeze external instruments and effects to save processing power.

NOTE

You must perform the freeze function in realtime. Otherwise external effects are not taken into account.

When freezing external instruments or effects, you can adjust the corresponding **Tail Size** value in the **Freeze Channel Options** dialog.

When the **Tail Size** is set to 0 s, freezing only takes into account the data within the part boundaries.



RELATED LINKS

VST Instruments on page 690
Audio Effects on page 439
Freezing Instruments on page 699
Freezing Insert Effects for a Track on page 449

Missing Plug-ins

The “Plug-in could not be found” message appears in the following situations:

- When you remove an external device from the **VST Connections** window although it is used in a saved project.
- When you transfer a project to another computer on which the external device is not defined.
- When you open a project that is created with an earlier version of Nuendo.

In the **VST Connections** window, the broken connection to the external device is indicated by an icon in the **Bus Name** column.

- To reestablish the broken connection to the external device, right-click the entry for the device in the **Bus Name** column and select **Connect External Effect**.

NOTE

Busses that are set up for external instruments or external effects are saved globally, that is, for your particular computer setup.

Editing the Bus Configurations

After you have set up all the required busses for a project you can edit the names and change port assignments. The bus configuration is saved with the project.

Removing Busses

PROCEDURE

- In the **VST Connections** window, right-click a bus in the list and select **Remove Bus**.

  You can also select the bus and press [Backspace].

Changing Port Assignments

You can change the port assignment of busses in the **VST Connection** window.

- To change a port assignment, click in the **Device Port** column of a bus and select a new port.
- To assign different ports to the selected busses, open the **Device Port** pop-up menu for the first selected entry, press [Shift], and select a device port.

  All subsequent busses are automatically connected to the next available port.

  NOTE

  Exclusive ports, for example, ports that are already assigned to **Control Room** channels, are skipped.

- To assign the same port to all selected busses, open the **Device Port** pop-up menu for the first selected entry, press [Shift]-[Alt]/[Option], and select a device port.

Renaming Multiple Busses

You can rename all the selected busses at once using incrementing numbers or letters.

- To use incrementing numbers, select the busses that you want to rename and enter a new name for one of the busses, followed by a number.

  For example, if you have eight inputs that you want to be named “In 1, In 2, …, In 8”, you select all the busses and enter the name `In 1` for the first bus. All other busses are then renamed automatically.

- To use letters from the alphabet, select the busses that you want to rename and enter a new name for one of the busses, followed by a space and a capital letter.

  For example, if you have three FX channels that you want to be named “FX A, FX B, and FX C”, you select all the channels and enter the name `FX A` for the first. All other channels are renamed automatically. The last letter that can be used is Z. If you have more selected entries than there are letters available, the remaining entries are skipped.

NOTE

You can begin renaming from any position in the list. The renaming starts from the bus where you edit the name, goes down the list to the bottom, and then continues from the top until all selected busses have been renamed.

Identifying Exclusive Port Assignments

For certain channel types, the port assignment is exclusive.

Once a port has been assigned to such a bus or channel, it must not be assigned to another bus, otherwise the connection to the first bus will be broken.

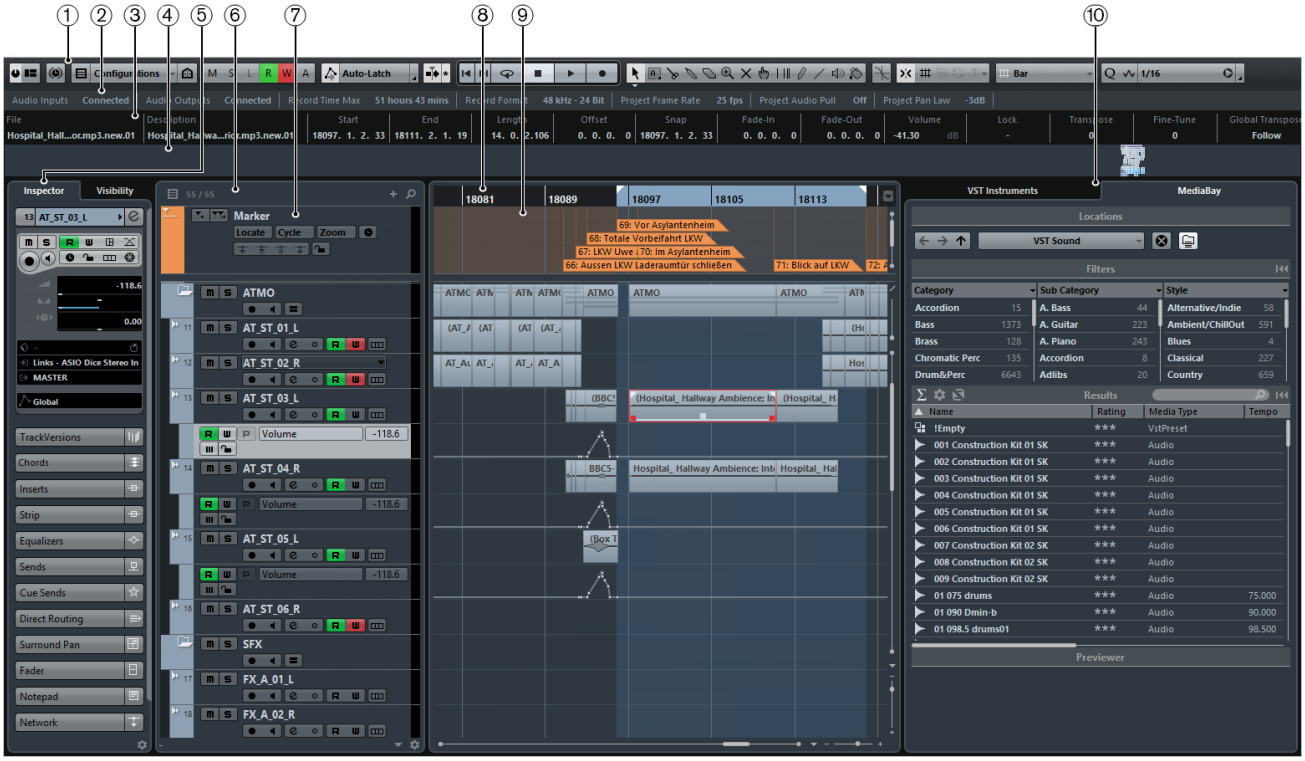
The corresponding ports are marked in red in the **VST Connections** window on the **Device Port** pop-up menu.

Project Window

The **Project** window provides an overview of the project, and allows you to navigate and perform large scale editing.

Each project has one **Project** window. The **Project** window is displayed whenever you open or create a new project.

- To open a project, select **File > Open**.
- To create a new project, select **File > New Project**.



The **Project** window is divided into several sections:

1) **Toolbar**

   Holds tools and shortcuts for opening other windows and various project settings and functions.

2) **Status Line**

   Shows the most important project settings.

3) **Info Line**
Shows information about the currently selected event or part in the Project window.

4) **Overview Line**
Shows events and parts as boxes and allows you to zoom and navigate in the project.

5) **Inspector**
Shows controls and parameters for the first selected track.

6) **Global Track Controls**
Shows the global track controls.

7) **Track List**
Shows the tracks and their controls.

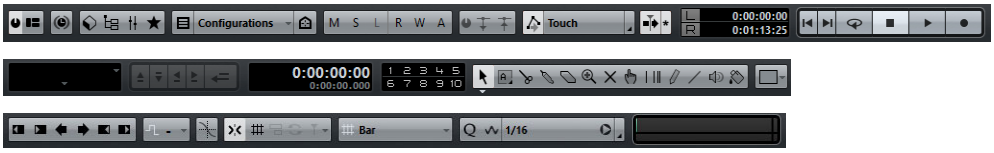
8) **Ruler**
Shows the timeline and the display format of the project.

9) **Event Display**
Shows the parts and events of the project.

10) **Racks**
Shows the **VST Instruments** and the **MediaBay**.

Toolbar

The toolbar holds tools and shortcuts for opening other windows and various project settings and functions.



- To display all toolbar elements, right-click in an empty area of the toolbar and select **Show All**.

The following options are available:

Activate Project

Allows you to activate a project.

Set up Window Layout

Allows you to show or hide the sections Inspector, status line, info line, and overview line.

Constrain Delay Compensation

Allows you to minimize the latency effects of the delay compensation.

Media & MixConsole Windows

These buttons allow you to open or close the MediaBay, the Pool, the MixConsole, and the Control Room Mixer.

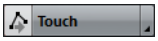
State buttons

These buttons show the mute, solo, listen, and automation states.

Network Controls

These buttons allow you to share or sync your project or to commit changes when using the network functions.

Automation Mode

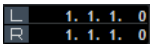


Shows the automation mode and allows you to open the Automation panel. Activate **Automation Follows Events** if you want your automation events to follow automatically when you move an event or part on a track.

Auto-Scroll

Allows you to activate the **Auto-Scroll** and **Suspend Auto-Scroll when Editing** options. These determine if the waveform display is scrolled during playback.

Locators



Shows the left and right locator positions.

Transport Buttons

Shows the transport controls.

Arranger Controls

Shows the controls for the arranger track.

Time Display

Shows the time display.

Markers

Shows the marker buttons.

Tool Buttons

Shows the buttons for editing in the **Project** window.

Color Menu

Allows you to define the **Project** window colors.

Nudge Palette

Allows you to nudge or trim events or parts.

Project Root Key

Allows you to change the root key of the project.

Snap to Zero Crossings

If this option is activated, it finds zero crossings when you split and size audio events.

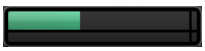
Snap

Allows you to restrict horizontal movement and positioning to certain positions.

Quantize

Allows you to move recorded audio or MIDI to musical relevant positions.

Performance Meter



Shows the meters for ASIO time usage and hard disk transfer load.

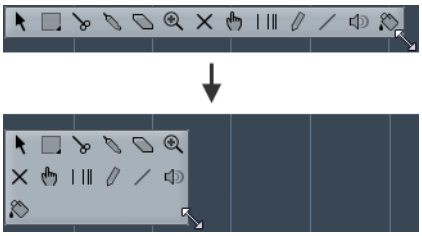
Toolbox

The toolbox makes the editing tools from the toolbar available at the mouse pointer position. It can be opened instead of the standard context menus in the event display and editors.

- To activate the toolbox function, select **File > Preferences > Editing > Tools** and activate **Pop-up Toolbox on Right-Click**.
- To open the toolbox, right-click in the event display or editor.

  If **Pop-up Toolbox on Right-Click** it is deactivated, the context menu opens.
- To open the context menu instead of the toolbox, press any modifier key and right-click in the event display or editor.

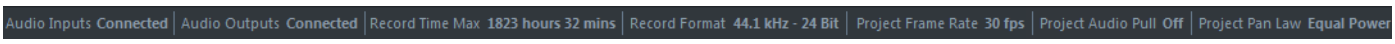
  If **Pop-up Toolbox on Right-Click** is deactivated, press any modifier key to open the toolbox instead of the context menu.
- To change the number of rows in which the tools are arranged on the toolbox, keep the right mouse button pressed on the toolbox until the mouse pointer changes to a double arrow, and drag to the bottom or right.



Status Line

The status line shows the most important project settings.

- To show or hide the status line, click **Set up Window Layout** on the toolbar and activate or deactivate **Status Line**.



The following information is shown in the status line:

Audio Inputs

Displays the connection state of your audio inputs. Click in this field to open the **VST Connections** dialog.

Audio Outputs

Displays the connection state of your audio outputs. Click in this field to open the **VST Connections** dialog.

Record Time Max

Displays the remaining time for recording, depending on your project settings and the available hard disk space. Click in this field to display the remaining record time in a separate window.

Record Format

Displays the sample rate and the bit resolution used for recording. Click in this field to open the **Project Setup** dialog.

Project Frame Rate

Displays the frame rate used in the project. Click in this field to open the **Project Setup** dialog.

Project Audio Pull

Displays the audio pull setting used in the project. Click in this field to open the **Project Setup** dialog.

Project Pan Law

Displays the current pan law setting. Click in this field to open the **Project Setup** dialog.

Info Line

The info line shows information about the currently selected event or part in the **Project** window.

- To show or hide the info line, click the **Set up Window Layout** button on the toolbar and activate or deactivate the **Info Line** option.

Editing in the Info Line

You can edit almost all event or part data on the info line using regular value editing.

If you select several events or parts, the info line is shown in another color and only the information about the first item in the selection is displayed. The following rules apply:

- Value changes are applied to all selected elements, relatively to the current values.

  For example, you have selected two audio events. The first event has a length of 1 bar, the second of 2 bars. If you change the info line value to 3, the first event is resized to 3 bars and the second event to 4 bars.

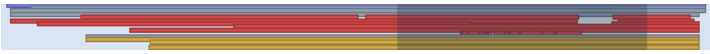
- Value changes are applied absolutely to the current values, if you press [Ctrl]/[Command] while modifying the value on the info line.

  In the example above, both events are resized to 3 bars.

- To change the modifier, select **File > Preferences > Editing > Tool Modifiers** and select a new modifier in the **Info Line** category.

Overview Line

The overview line allows you to zoom and navigate to other sections in the **Project** window.



- To show or hide the overview line, click the **Set up Window Layout** button on the toolbar and activate or deactivate **Overview Line**.

In the overview line, events and parts are displayed as boxes. A rectangle indicates the section of the project that is currently displayed in the event display.

- To zoom the event display in or out horizontally, resize the rectangle by dragging the edges.
- To navigate to another section of the event display, drag the rectangle to the left or right, or click in the upper part of the overview.

Ruler

The ruler shows the timeline and the display format of the project.

Initially, the **Project** window ruler uses the display format that is specified in the **Project Setup** dialog.

- To select an independent display format for the ruler, click the arrow button to the right of the ruler and select an option from the pop-up menu.
- To set the display format globally for all windows, use the primary display format pop-up on the Transport panel, or hold down [Ctrl]/[Command] and select a display format in any ruler.

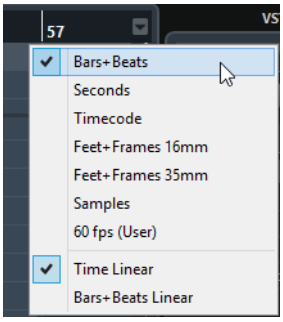
RELATED LINKS

Project Setup Dialog on page 73

Ruler Display Formats

You can select a display format for the ruler.

- To select a new display format for the ruler, click the arrow button to the right of the ruler and select an option from the pop-up menu.



The selection that you make affects the time display formats in the following areas:

- Ruler
- Info line
- Tooltip position values

The following options are available:

Bars+Beats

Bars, beats, sixteenth notes, and ticks. By default, there are 120 ticks per sixteenth note, but you can adjust this with the **MIDI Display Resolution** setting (**File > Preferences > MIDI**).

Seconds

Hours, minutes, seconds, and milliseconds.

Timecode

Hours, minutes, seconds, and frames. The number of frames per second (fps) is set in the **Project Setup** dialog with the **Frame Rate** pop-up menu. You can also display subframes by activating **Show Timecode Subframes** (**File > Preferences > Transport**).

Feet+Frames 16 mm

Feet and frames, with 40 frames per foot. To let the beginning of a project always start at 0'00, regardless of any **Start** offset settings in the **Project Setup** dialog, activate **Feet'n'Frames Count from Project Start** (**File > Preferences > Transport**).

Feet+Frames 35 mm

Feet, frames, and 1/4 frames, with 16 frames per foot. To let the beginning of a project always start at 0'00, regardless of any **Start** offset settings in the **Project Setup** dialog, activate **Feet'n'Frames Count from Project Start** (**File > Preferences > Transport**).

Samples

Samples

fps (User)

Hours, minutes, seconds, and frames, with a user-definable number of frames per second. You can also display subframes by activating **Show Timecode Subframes** (**File > Preferences > Transport**). You can also set the number of fps.

Time Linear

Sets the ruler linear to time.

Bars+Beats Linear

Sets the ruler linear to bars and beats.

Inspector

The **Inspector** shows the controls and parameters for the topmost selected track in the track list.

- To show or hide the **Inspector**, click the **Set up Window Layout** button on the toolbar and activate or deactivate **Inspector**.

Inspector Sections

The **Inspector** is divided into a number of sections that each contain different controls for the track.

Not all **Inspector** sections are shown by default. The available sections depend on the selected track type.

- To hide or show sections, click on their names.

  Clicking the name for a hidden section brings it into view and hides the other sections.

- To hide or show a section without closing the other sections, [Ctrl]/[Command]-click the section name.

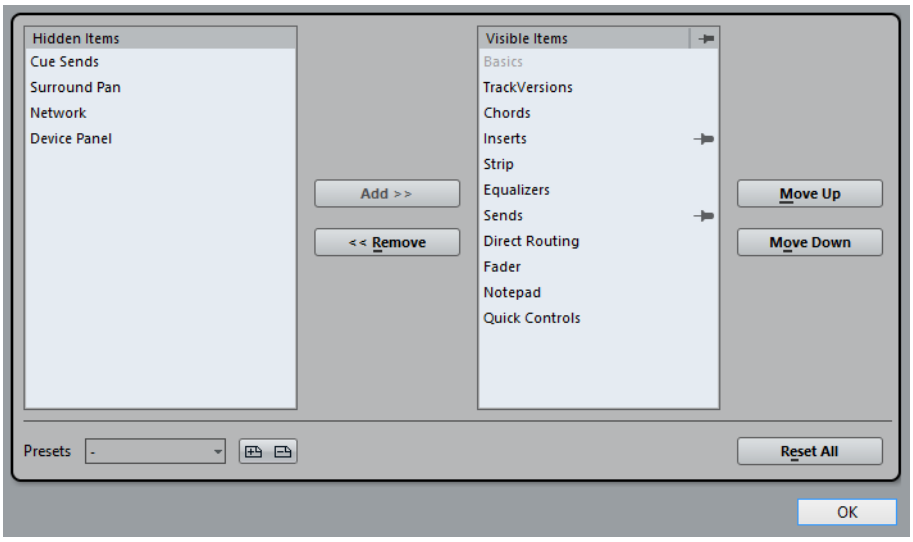
RELATED LINKS

Audio Track Inspector on page 87
Instrument Track Inspector on page 95
MIDI Track Inspector on page 102
Arranger Track Inspector on page 109
Chord Track Inspector on page 111
Marker Track Inspector on page 127
Signature Track Inspector on page 130
Tempo Track Inspector on page 131
Transpose Track Inspector on page 132
VCA Fader Track Inspector on page 134
Video Track Inspector on page 136
Loudness Track Inspector on page 138

Setting Up Inspector Sections

You can set up the visible **Inspector** sections for all tracks of the selected track type.

- To open the **Audio Track Inspector Settings** dialog, click the **Open Inspector Settings Dialog** button at the bottom right of the **Inspector**.



Hidden Items

This section displays sections currently hidden in the Inspector.

Visible Items

This section displays sections currently visible in the Inspector.

Pin

Allows you to pin the open/close status of the selected Inspector section.

Add

Allows you to move an item selected in the hidden sections list to the list of visible sections.

Remove

Allows you to move an item selected in the visible sections list to the list of hidden sections.

Move Up/Move Down

Allows you to change the order of an item in the list of visible sections.

Presets

Allows you to save Inspector section settings as presets.

Reset All

Allows you to restore all default Inspector section settings.

Global Track Controls

The global track controls area above the track list allows you to manage the tracks in the track list.

1) **Filter Track Types**

Allows you to determine which track types are shown in the track list.

2) **Number of Visible Tracks**

Displays how many tracks are hidden. Click this, to show all tracks that are filtered out on the **Visibility** Inspector tab.

NOTE

You cannot undo visibility changes. Tracks that are hidden through the Track Types filter cannot be shown by clicking the number of visible tracks.

3) **Add Track**

Allows you to add tracks to the track list.

4) **Find Tracks**

Allows you to find and select a specific track in the track list.

RELATED LINKS

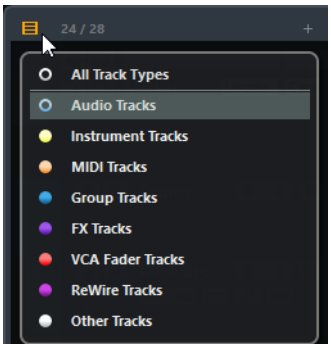
Channel Selector on page 357

Filtering Track Types

PROCEDURE

1. Click **Filter Track Types** above the track list.

   This opens the track types filter.



2. Click a dot to the left of a track type to hide it.

RESULT

Tracks of the filtered type are removed from the track list and the color of the **Filter Track Types** button changes to indicate that a track type is hidden.

Finding Tracks

The **Find Tracks** function allows you to find specific tracks. This is useful if you have a large project with many tracks or if you have hidden tracks using the track visibility features.

PROCEDURE

1. Click **Find Tracks** above the track list, to open a selector that lists all tracks.
2. In the search field, enter the name of the track.

   As you type, the selector updates automatically.
3. In the selector, select the track and press [Return].

RESULT

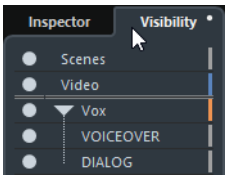
The selector closes and the track is selected in the track list.

NOTE

If the track was outside the view or hidden, it is now shown. Tracks that are hidden using **Filter Track Types** are not shown.

Visibility

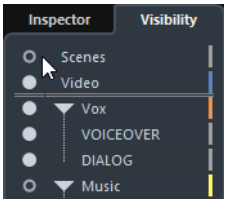
The **Visibility** tab in the **Inspector** allows you to determine which individual tracks are shown in the track list.



- To open the **Visibility** tab, click its tab in the **Inspector**.

Showing/Hiding Individual Tracks

The **Visibility** tab shows a list of all current tracks. Here you can show and hide individual tracks.



- To show or hide a track in the track list, click a dot to the left of a track.
- To activate or deactivate several tracks at the same time, select them and press [Return].
- To show a hidden track exclusively, [Shift]-click the dot.
- To expand or collapse a folder, click the triangle to the left of a folder track.

Synchronizing Track and Channel Visibility

You can synchronize the track visibility in the **Project** window with the channel visibility in the **MixConsole**.

PROCEDURE

1. In the **Inspector**, open the **Visibility** tab and click the dot to open the **Sync Track/Channel Visibility** menu.
2. Select **Sync Project and MixConsole** to synchronize the track visibility with the channel visibility.

RESULT

The dot in the **Visibility** tab changes to indicate that the track and channel visibility are synchronized.

NOTE

- You can only synchronize the track visibility in the **Project** window with the channel visibility of one **MixConsole**. If you enable **Sync Track/Channel Visibility** for a second **MixConsole**, the first link is lost.
- If you divide the track list, the top part of the list is not affected. Likewise, channels in the left or right zones of the **MixConsole** are not synchronized.

RELATED LINKS

Synchronizing Channel and Track Visibility on page 364

Track List

The track list shows the tracks that are used in the project. When a track is added and selected, it contains name fields and settings for this track.

- To decide which controls are visible for each track type, right-click the track list and open the **Track Controls Settings** dialog.

RELATED LINKS

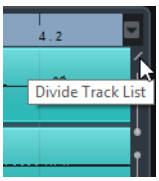
Customizing Track Controls on page 139

Dividing the Track List

You can divide the track list into an upper track list and a lower track list. These track lists can have independent zoom and scroll controls.

Dividing the track list is useful if you are working with a video track and multi-track audio, for example. It allows you to place the video track in the upper track list and to scroll the audio tracks separately in the lower track list, so that they can be arranged with the video.

- To divide the track list, click the **Divide Track List** button in the top right corner of the **Project** window below the ruler.

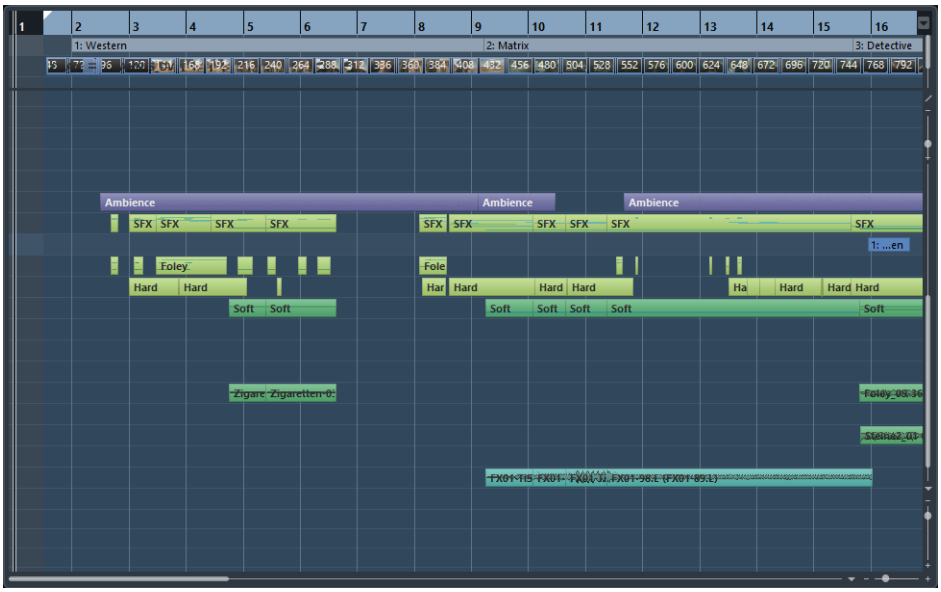


Video, marker, or arranger tracks are automatically moved to the upper track list. All other track types are moved to the lower track list.

- To move any type of track from the lower track list to the upper and vice versa, right-click it in the track list and select **Toggle Track List** from the context menu.
- To resize the upper part of the track list, click and drag the divider between the track list sections.
- To revert to a single track list, click **Divide Track List** again.

Event Display

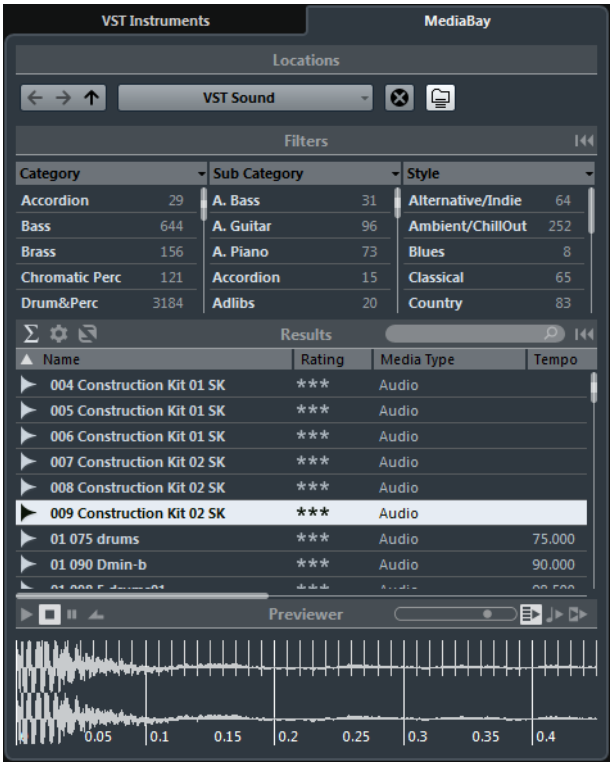
The event display shows the parts and events that are used in the project. They are positioned along the timeline.



Racks

The racks zone of the project window allows you to display the **VST Instruments** and the **MediaBay**.

- To show or hide the rack zone, click the **Set up Window Layout** button on the toolbar and activate or deactivate **Racks**.



- Click the **VST Instruments** tab to add and edit VST instruments from within the rack zone of the project window.
- Click the **MediaBay** tab to drag audio events and MIDI parts into project window or to drag audio events and MIDI parts from the project window into the MediaBay and store them as audio or MIDI loops.

Zooming in the Project Window

You can zoom in the **Project** window according to the standard zoom techniques.

Note the following:

- When you are using the **Zoom** tool (magnifying glass), the zooming result depends on the **Zoom Tool Standard Mode: Horizontal Zooming Only** option (**File > Preferences > Editing > Tools**).

  If this option is activated and you drag a selection rectangle with the **Zoom** tool, the window is only zoomed horizontally, the track height does not change. If the option is deactivated, the window is zoomed both horizontally and vertically.

- When you are using the vertical zoom sliders, the tracks are scaled relatively.

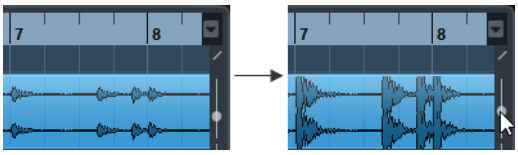
  If you have made any individual track height adjustments, the relative height differences are maintained.

- If the **Zoom while Locating in Time Scale** option (**File > Preferences > Transport**) is activated, you can also zoom by clicking in the ruler and dragging up or down with the left mouse button pressed.

  Drag up to zoom out; drag down to zoom in.

- To zoom in on the contents of parts and events vertically, use the waveform zoom slider in the top right corner of the event display.

  This is useful when viewing quiet audio passages.



IMPORTANT

To get an approximate reading on the level of the audio events by viewing the waveforms, make sure this slider is all the way down. Otherwise, zoomed waveforms may be mistaken for clipped audio.

- If the **Quick Zoom** option (**File > Preferences > Editing**) is activated, the contents of parts and events are not continuously redrawn when you zoom manually. Instead, the contents are redrawn once you have stopped changing the zoom. Activate the **Quick Zoom** option if screen redraws are slow on your system.

Zoom Submenu

The **Zoom** submenu contains options for zooming in the **Project** window.

- To open the **Zoom** submenu, select **Edit > Zoom**.

The following options are available:

Zoom In

Zooms in one step, centering on the project cursor.

Zoom Out

Zooms out one step, centering on the project cursor.

Zoom Full

Zooms out so that the whole project is visible. The whole project means the timeline from the project start to the length set in the **Project Setup** dialog.

Zoom to Selection

Zooms in horizontally and vertically so that the current selection fills the screen.

Zoom to Selection (Horiz.)

Zooms in horizontally so that the current selection fills the screen.

Zoom to Event

This option is available only in the **Sample Editor**.

Zoom In Vertically

Zooms in one step vertically.

Zoom Out Vertically

Zooms out one step vertically.

Zoom In Tracks

Zooms in on the selected tracks one step vertically.

Zoom Out Tracks

Zooms out the selected tracks one step vertically.

Zoom Selected Tracks

This zooms in vertically on the selected tracks and minimizes the height of all other tracks.

Undo/Redo Zoom

These options allow you to undo/redo the last zoom operation.

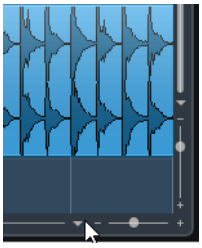
RELATED LINKS

Zooming on page 514

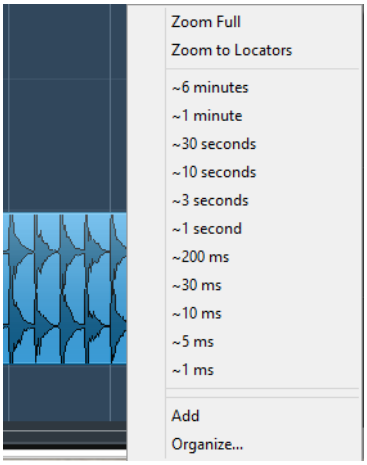
Zoom Presets

You can create zoom presets that allow you to set up different zoom settings. For example, one where the whole project is displayed in the **Project** window and another with a high zoom factor for detailed editing. The **Zoom Presets** pop-up menu allows you to select, create, and organize zoom presets.

- To open the **Zoom Presets** pop-up menu, click the button to the left of the horizontal zoom control.



The upper part of the menu lists the zoom presets.



- To save the current zoom setting as a preset, open the **Zoom Presets** pop-up menu and select **Add**. In the **Type In Preset Name** dialog that opens, type in a name for the preset and click **OK**.
- To select and apply a preset, select it from the **Zoom Presets** pop-up menu.
- To zoom out so that the whole project is visible, open the **Zoom Presets** pop-up menu and select **Zoom Full**.

  This displays the project from the project start to the length that is set in the **Project Setup** dialog.
- To delete a preset, open the **Zoom Presets** pop-up menu and select **Organize**. In the dialog that opens, select the preset in the list and click the **Delete** button.
- To rename a preset, open the **Zoom Presets** pop-up menu and select **Organize**. In the dialog that opens, select a preset in the list and click the **Rename** button. In the dialog that opens, type in a new name for the preset. Click **OK** to close the dialogs.

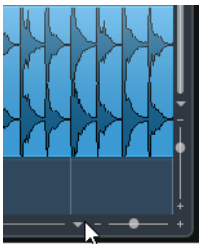
IMPORTANT

Zoom presets are global for all projects. They are available in all projects that you open or create.

Zooming In On Cycle Markers

You can zoom in on the area between cycle markers in the project.

- To zoom in on a cycle marker, click the button to the left of the horizontal zoom control to open a pop-up menu and select a cycle marker.



The middle part of the pop-up menu lists any cycle markers that you have added to the project.

NOTE

Only the cycle markers that you create in the current project are available on the menu.

If you select a cycle marker from this menu, the event display is zoomed in to encompass the marker area.

You cannot edit the cycle markers in this pop-up menu.

RELATED LINKS

Markers Window on page 314

Zoom History

You can undo and redo zoom operations. This way you can zoom in several steps and then easily go back to the zoom stage at which you started.

You can undo and redo zoom operations in the following ways:

- To undo zoom, select **Edit > Zoom > Undo Zoom** or double-click with the zoom tool (magnifying glass).
- To redo zoom, select **Edit > Zoom > Redo Zoom** or press [Alt]/[Option] and double-click with the zoom tool (magnifying glass).

Snap Function

The Snap function helps you to find exact positions when editing in the **Project** window. It does this by restricting horizontal movement and positioning to certain positions. Operations affected by Snap include moving, copying, drawing, sizing, splitting, range selection, etc.

- To activate/deactivate **Snap**, activate/deactivate the **Snap** icon on the toolbar.

Setting the Snap Point

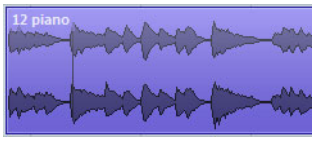
You can set the snap point at any position of the audio event.

PROCEDURE

1. Select an event.
2. Place the project cursor at a position within the selected audio event.
3. Select **Audio > Snap Point To Cursor**.

RESULT

The snap point is set at the cursor position.



The snap point for an event is displayed as a vertical line in the **Project** window.

NOTE

You can also set the snap point in the **Sample Editor**.

RELATED LINKS

Adjusting the snap point on page 517

Snap to Zero Crossing

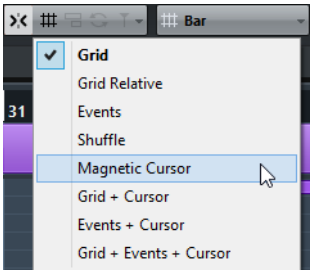
When splitting and sizing audio events, sudden amplitude changes can cause pops and clicks. To avoid this, you can activate **Snap to Zero Crossing** to snap to points where the amplitude is zero.

- To activate **Snap to Zero Crossing**, activate **Snap to Zero Crossing** on the toolbar.

Snap Types

You can select between different snap types to determine the snap point.

- To select a snap type, open the **Snap Type** pop-up menu.

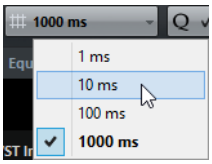


The following snap types are available:

Grid

If this option is activated, the snap points are set with the **Grid Type** pop-up menu. The options depend on the display format that are selected for the ruler.

When you select **Seconds** as ruler format, the **Grid Type** contains time-based grid options.



Grid Relative

If this option is activated, events and parts are not magnetic to the grid. Rather, the grid determines the step size for moving the events. This means that a moved event keeps its original position relative to the grid.

For example, if an event starts at the position 3.04.01, snap is set to **Grid Relative** and the **Grid Type** pop-up menu is set to **Bar**, you can move the event in steps of one bar to the positions 4.04.01, 5.04.01, and so on.

NOTE

This only applies when dragging existing events or parts. When you create new events or parts this snap type works like **Grid**.

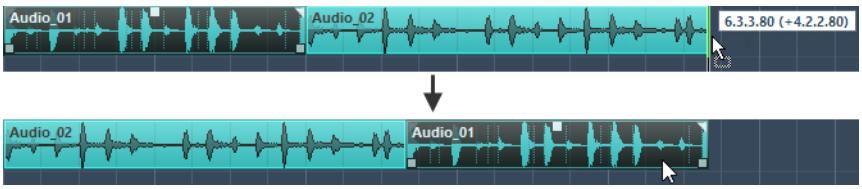
Events

If this option is activated, the start and end positions of other events and parts become magnetic. This means that if you drag an event to a position near the start or end of another event, it is automatically aligned with the start or end of the other event.

For audio events, the position of the snap point is also magnetic. This includes marker events on the marker track.

Shuffle

Shuffle is useful when you want to change the order of adjacent events. If you have two adjacent events and drag the first one to the right, past the second event, the two events will change places.



The same principle works when changing the order of more than two events:

1	2	3	4	5

Dragging event 2 past event 4…

1	3	4	2	5

…changes the order of events 2, 3, and 4.

Magnetic Cursor

This grid type lets the project cursor become magnetic. Dragging an event near the cursor causes the event to be aligned with the cursor position.

Grid + Cursor

This is a combination of **Grid** and **Magnetic Cursor**.

Events + Cursor

This is a combination of **Events** and **Magnetic Cursor**.

Events + Grid + Cursor

This is a combination of **Events**, **Grid**, and **Magnetic Cursor**.

Cross-Hair Cursor

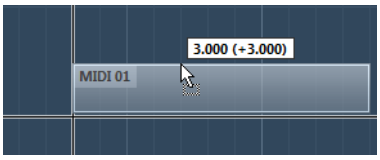
The cross-hair cursor is displayed when working in the **Project** window and in the editors, facilitating navigation and editing, especially when arranging large projects.

- To set up the cross-hair cursor, select **File > Preferences > Editing > Tools**.

  You can set up the colors for the line and the mask of the cross-hair cursor, and define its width.

The cross-hair cursor works as follows:

- When the **Object Selection** tool or one of its subtools is selected, the cross-hair cursor appears when you start moving/copying a part/event, or when using the event trim handles.

  Cross-hair cursor when moving an event.

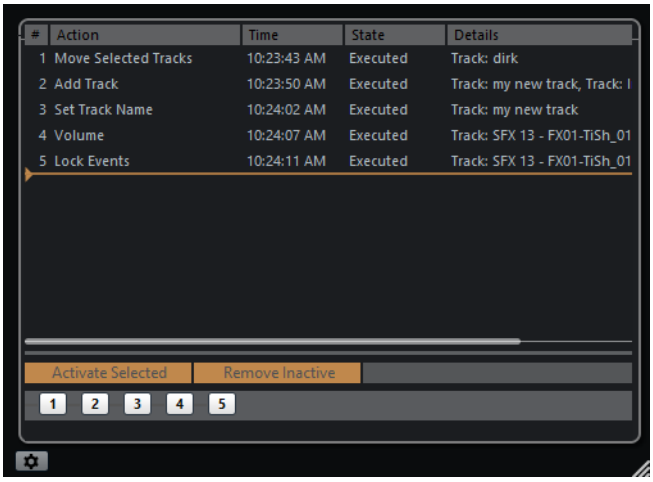
- When the **Object Selection** tool, the **Cut** tool, or any other tool that makes use of this function is selected, the cross-hair cursor appears as soon as you move the mouse over the event display.

- The cross-hair cursor is only available for tools where such a function is of any use. The **Mute** tool, for example, does not use a cross-hair cursor, as you have to click directly on an event to mute it.

Edit History Dialog

In the **Edit History** dialog, you can undo all actions in the **Project** window as well as in the editors. You can also undo audio processes or applied plug-in effects. However, these are better removed and modified using the Offline Process History. The dialog contains a list of all your edits, with the most recent action at the bottom of the list.

- To open the **Edit History** dialog, select **Edit > History**.



The **Action** column displays the name of the action while the **Time** column tells you when this action was performed. In the **Details** column further details are shown. Here you can enter new text by double-clicking in the column.

- To undo your actions, move the horizontal, colored line upwards to the desired position.

  You can only undo your actions in reverse order, for example, the last performed action is the first action to be undone.

- To redo an action that was undone previously, move the line down the list again.

RELATED LINKS

The Offline Process History dialog on page 489

Setting the Number of Maximum Undo Steps

You can limit the number of maximum undo steps. This is useful if you run out of hard disk space, for example.

PROCEDURE

1. Select **File > Preferences > General**.
2. Set the number in the **Maximum Undo Steps** field.

Working with Branches

You can gather actions in branches. This way you do not have to undo every single action that you performed, instead you can undo whole branches.

A branch is created when you have undone at least one action. All following actions you perform are then gathered in a new branch.

- To activate branches, select **File > Preferences > General** and activate **Use Undo Branches**.
- To see and edit the branches, select **Edit > Edit History**.

Undoing Edits of Separate Branches

If you have two or more branches, you can choose to undo edits of the separate branches.

PROCEDURE

1. Select **Edit > Edit History**.
2. In the lower part of the **Edit History** dialog, click on a branch to select it.
   The corresponding actions are listed in the upper part of the dialog.
3. Click the **Activate Selected** button or click a second time on the branch to activate it.

RESULT

All actions from the subsequent branches are undone while all actions of the now active branch are redone.

If you undo some of the actions and then perform new edit operations, a new child branch is created at that position in the tree.

Removing Branches

You can remove inactivate branches that you no longer need.

IMPORTANT

Removing inactive branches cannot be undone.

PROCEDURE

1. Select **Edit > Edit History**.
2. In the lower part of the **Edit History** dialog, click **Remove Inactive**.

Result

All inactive branches are removed, leaving only the active actions on a single, linear branch.

After Completing This Task

You can now undo separate actions of the branch as usual in the upper part of the dialog.

Project Handling

Creating New Projects

You can create empty projects or projects that are based on a template.

PROCEDURE

1. Select **File > New Project**.

   Depending on your settings, either the **Steinberg Hub** or the **New Project** dialog opens.

2. Steinberg Hub only: In the location options section, select where to store the new project.
   - To use the default location, select **Use default location**.
   - To choose another location, select **Prompt for project location**.

3. Do one of the following:
   - To create an empty new project via **Steinberg Hub**, click **Create Empty**.
   - To create an empty new project via the **New Project** dialog, select **Empty** and click **OK**.
   - To create a new project from a template via **Steinberg Hub**, select a template and click **Create**.
   - To create a new project from a template via the **New Project** dialog, select a template and click **OK**.

RESULT

A new, untitled project is created. If you selected a template, the new project is based on this template and includes the corresponding tracks, events, and settings.

NOTE

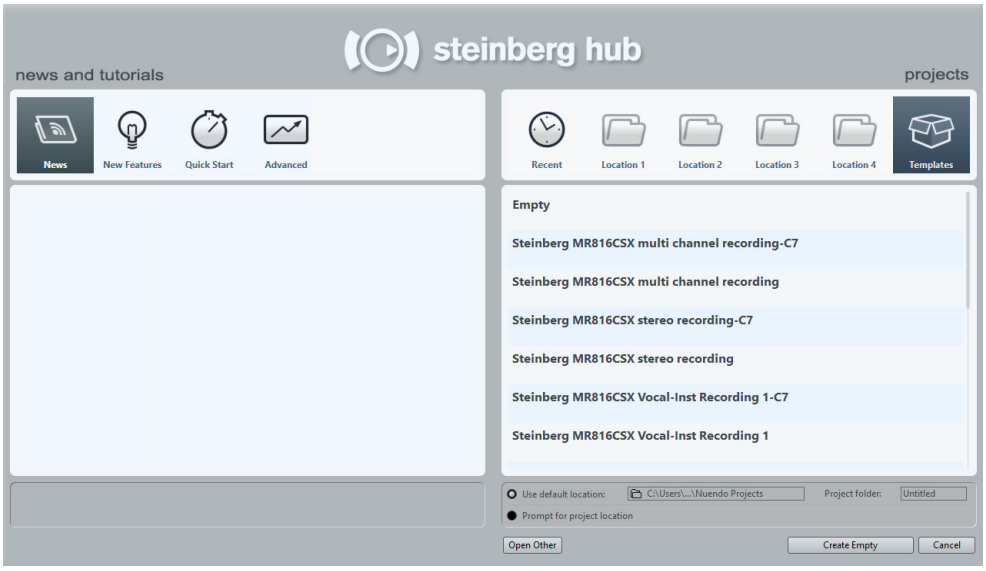
If you create an empty project, your default presets for the input and output bus configurations are applied. If you have not defined default presets, the last used configurations are applied.

RELATED LINKS

Presets for Input and Output Busses on page 31

Steinberg Hub

When you start Nuendo or create new projects using the **File** menu, **Steinberg Hub** opens. **Steinberg Hub** keeps you up to date with the latest information and assists you with organizing your projects. It consists of the **News and Tutorials** section and the **Projects** section.



News and Tutorials section

The **News and Tutorials** section displays Steinberg news, tutorial videos as well as links to the user forum, downloads, and Knowledge Base.

NOTE

Ensure that you have an active internet connection to access this material.

Projects section

The **Projects** section lets you create new projects, which can either be empty or based on a template. It lets you specify where to save the projects. It also allows you to access recently opened projects or projects that are stored in other locations.

Category bar

The **Recent** category contains a list of the recently opened projects.

The **Location** categories are user defined locations that contain projects.

The **Templates** category contains the available factory templates.

Template list

When you click on one of the category items, the list below the category bar shows the available templates for this category. Any new templates that you create are added at the top of the corresponding list.

Location options

This section allows you to specify where the project is stored.

Open other

This button allows you to open any project file on your system. This is identical to using the **Open** command on the **File** menu.

Deactivating Steinberg Hub

To start Nuendo or to create new projects without **Steinberg Hub**, you can deactivate it.

PROCEDURE

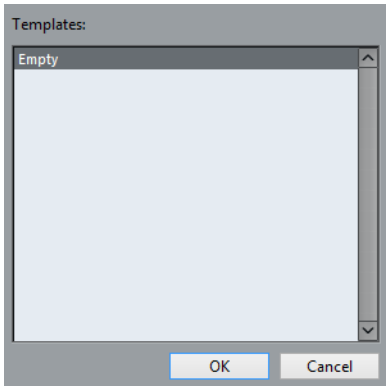
- Select **File > Preferences > General** and deactivate **Use Steinberg Hub**.

RESULT

Nuendo starts without opening a project and opens the **New Project** dialog when you create a new project using the **File** menu. However, you can still open Steinberg Hub through the **Steinberg Hub** menu.

New Project Dialog

When you deactivate **Steinberg Hub** and create new projects, the **New Project** dialog opens. This dialog allows you to create new projects which can either be empty or based on a template.



About Project Files

A project file (extension *.npr) is the central document in Nuendo. A project file contains references to media data that can be saved in the project folder.

NOTE

We recommend to save files only in the project folder, even though you can save them in any other location to which you have access.

The project folder contains the project file and the following folders that Nuendo automatically creates when necessary:

- Audio
- Clip Packages
- Edits
- Images
- Network
- Track Pictures

About Template Files

Templates can be a good starting point for new projects. Templates are projects where you can save all settings that you regularly use, such as bus configurations, sample rates, record formats, basic track layouts, VSTi setups, drum map setups, etc.

Template projects are not saved in project folders and therefore contain no subfolders and no media files.

- To open the location of a specific template, right-click a template in the template list and select **Show in Explorer** (Win) or **Reveal in Finder** (Mac).

Saving a Project Template File

You can save the current project as a template. When you create a new project, you can select this template as a starting point for your new project.

PREREQUISITE

Remove all clips from the Pool before you save the project as a template. This ensures that references to media data from the original project folder are deleted.

PROCEDURE

1. Set up a project.
2. Select **File > Save As Template**.
3. In the **New Preset** section of the **Save As Template** dialog, enter a name for the new project template.

4. In the **Attribute Inspector** section, double-click the **Value** field of the **Content Summary** attribute to enter a description for the template.
5. Click the **Value** field of the **Template Category** attribute and select a template category from the pop-up menu.

   If you do not select a category, the new template will be listed in **Steinberg Hub** in the **Templates** category.
6. Click **OK** to save the template.

Renaming Templates

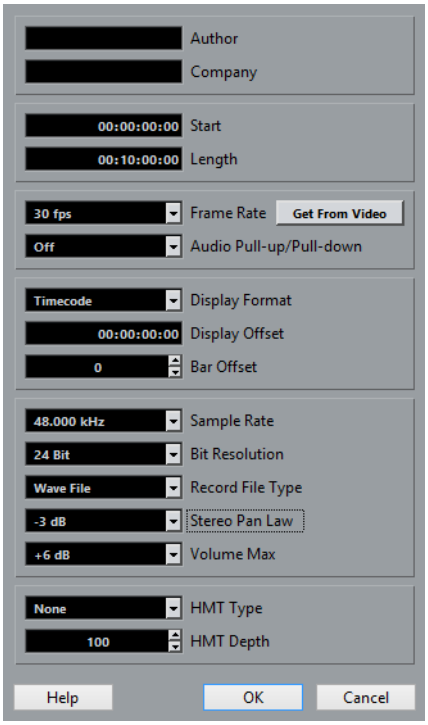
PROCEDURE

1. In Steinberg Hub, right-click a template and select **Rename**.
2. In the **Rename** dialog, enter a new name and click **OK**.

Project Setup Dialog

You can perform general settings for your project in the **Project Setup** dialog.

- To open the **Project Setup** dialog, select **Project > Project Setup**.
- To open the **Project Setup** dialog automatically when you create a new project, activate the **Run Setup on Create New Project** option (**File > Preferences > General**).



IMPORTANT

While most **Project Setup** settings can be changed at any time, you must set the sample rate directly after creating a new project. If you change the sample rate at a later stage, you must convert all audio files in the project to the new sample rate to make them play back properly.

The following options are available:

Author

Allows you to specify a project author that is written into the file, when you export audio files and activate the **Insert iXML chunk** option. You can specify a default author in the **Default Author Name** field (**File > Preferences > General > Personalization**).

Company

Allows you to specify a company name that is written into the file, when you export audio files and activate the **Insert iXML chunk** option. You can specify a default company in the **Default Company Name** field (**File > Preferences > General > Personalization**).

Start

Allows you to specify the start time of the project in timecode format. This also determines the sync start position when synchronizing to external devices.

Length

Allows you to specify the length of the project.

Frame Rate

Allows you to specify the timecode standard and frame rate for the project. When synchronizing to an external device, this setting must correspond to the frame rate of any incoming timecode.

Get From Video

Allows you to set the project frame rate to the frame rate of an imported video file.

Audio Pull-up/Pull-down

Allows you to adjust audio playback speed to match the video. If you select a pull factor that is not supported by your hardware, this is indicated by a different color.

Display Format

Allows you to specify the global display format that is used for all rulers and position displays in the program, except the ruler tracks. However, you can make independent display format selections for the individual rulers and displays.

Display Offset

Allows you to specify an offset for the time positions that are displayed in the rulers and position displays to compensate for the Start position setting.

Bar Offset

This setting is only used, when you select the Bars+Beats display format. Allows you to specify an offset for the time positions that are displayed in the rulers and position displays to compensate for the Start position setting.

Sample Rate

Allows you to specify the sample rate at which records and plays back audio.

- If your audio hardware generates the sample rate internally and you select a non-supported sample rate, this is indicated by a different color. In this case, you must set a different sample rate to make your audio files play back properly.
- If you select a sample rate that your audio hardware supports, but that differs from its current sample rate setting, it is automatically changed to the project sample rate.
- If your audio hardware is externally clocked and receives external clock signals, sample rate mismatches are accepted.

Bit Resolution

Allows you to specify the resolution of the audio files that you record in Nuendo. Select the record format according to the bit resolution that is delivered by your audio hardware. The available options are 16 Bit, 24 Bit, and 32 Bit float.

NOTE

- When you record with effects, consider setting the bit resolution to 32 Bit Float. This prevents from clipping (digital distortion) in the recorded files and keeps the audio quality absolutely pristine. Effect processing and level or EQ changes in the input channel are done in 32 Bit Float format. If you record at 16 or 24 Bit, the audio will be converted to this lower resolution when it is written to a file. As a result, the signal may degrade. This is independent of the actual resolution of your audio hardware. Even if the signal from the audio hardware has a resolution of 16 Bit, the signal will be 32 Bit Float after the effects are added to the input channel.
- The higher the bit resolution, the larger the files and the more strain is put on the disk system. If this is an issue, you can lower the record format setting.

Record File Type

Allows you to specify the file type of the audio files that you record in Nuendo. The following file types are available:

- **Wave files** are a common file format on the PC platform. For recordings larger than 4 GB, the EBU RIFF standard is used. If a FAT 32 disk is used (not recommended), audio files are split automatically.
- **Wave 64** is a proprietary format developed by Sonic Foundry Inc. Audio-wise it is identical to the Wave format, but the internal file structure allows for much larger file sizes as required by long live recordings.
- **Broadcast Wave Files** are, in terms of audio content, identical with regular Wave files, but with embedded text strings for supplying additional information about the file. These can be set up in the Preferences dialog (Record–Audio–Broadcast Wave).
- **AIFF Files**, Audio Interchange File Format, is a defined standard by Apple Inc. and can be used on most computer platforms. AIFF files can contain embedded text strings. These can be set up in the Preferences dialog (Record–Audio–Broadcast Wave).
- **MXF Files**, Material Exchange Format, is a container format for digital video and audio. MXF files are used on most computer platforms. Each audio clip results in a single MXF file. Select this format if you plan to record content with AAF as the target format.

- **FLAC Files**, Free Lossless Audio Codec, is an open source format. Audio files recorded in this format are typically 50% to 60% smaller than regular Wave files.

NOTE

If your recorded Wave file is larger than 4 GB and **Use RF64 Format** is activated on the **When Recording Wave Files larger than 4GB** pop-up menu (**File > Preferences > Record > Audio**), your recording is saved as an RF64 file. This way, you do not have to worry about the file size during recording. However, keep in mind that this format is not supported by all applications.

Stereo Pan Law

If you pan a channel left or right, the sum of the left and right side is higher (louder), than if this channel is panned center. These modes allow you to attenuate signals panned center. **0dB** turns off constant-power panning. **Equal Power** means that the power of the signal remains the same regardless of the pan setting.

Volume Max

Allows you to specify the maximum fader level. By default, this is set to +12dB. If you load projects that were created with Nuendo versions older than 5.5, this value is set to the old default value of +6dB.

HMT Type (MIDI only)

Allows you to specify a mode for Hermode tuning of MIDI notes.

HMT Depth (MIDI only)

Allows you to specify the overall degree of retuning.

Opening Project Files

You can open one or several saved project files at the same time.

IMPORTANT

If you open a project saved with a different program version that contains data for functions that are not available in your version, this data may be lost when you save the project with your version.

NOTE

- If you open an external project, the last used view that was saved on your computer is used by default. You can change this setting in the **Preferences** dialog on the **General** page.

- By default, external projects are connected to the input and output busses automatically by default. If you open a project that was created on a computer with an ASIO port configuration different from the configuration of your computer, this can result in unwanted audio connections. You can deactivate the automatic connection of input and output busses in the **Preferences** dialog on the **VST** page.

PROCEDURE

1. Select **File > Open**.
2. In **Steinberg Hub**, click **Recent** or select a **Location**.
3. Select the project from the projects list, and click **Open**.
4. If there already is an open project, you are asked if you want to activate the new project. Do one of the following:
   - To activate the project, click **Activate**.
   - To open the project without activating it, click **No**.
     This reduces load times for projects.

RELATED LINKS

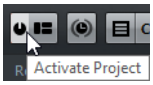
Workspaces for External Projects on page 1224
Do not Connect Input/Output Busses When Loading External Projects on page 1280

Activating Projects

If you have several projects opened at the same time in Nuendo, only one project can be active. The active project is indicated by the lit **Activate Project** button in the upper left corner of the **Project** window. If you want to work on another project, you have to activate the other project.

PROCEDURE

- To activate a project, click its **Activate Project** button.



Opening Project Files from Locations

You can open project files from specific locations. This is especially useful in situations where different users work on different projects on the same computer.

PROCEDURE

1. Select **File > Open**.
2. In **Steinberg Hub**, right-click a **Location** icon on the category bar.
3. In the **Locations** pop-up menu, select **Assign User Location**.

4. In the file dialog, select a location and click **OK**.

   All projects that are saved in this location are listed in the projects list. Depending on the size of the files, this may take a while.

   NOTE

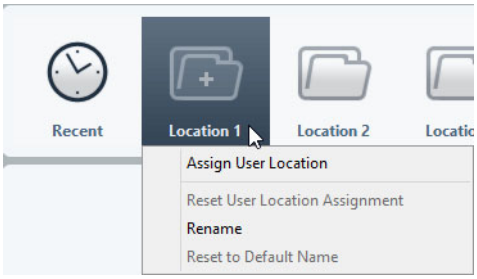
   You can add the location to the MediaBay to speed up the displaying of results.

5. In the projects list, select the project that you want to open.
6. Click **Open**.

Locations Menu

The **Locations** menu allows you to manage the user locations.

- To open the **Locations** menu, open **Steinberg Hub** and right-click a **Location** icon on the category bar.



The following options are available:

Assign User Location

Allows you to select a location on your computer.

Reset User Location Assignment

Deletes the assignment.

Rename

Allows you to rename the name of the location in **Steinberg Hub**. The name of the original location will not be changed.

Reset to Default Name

Resets the name of the location in **Steinberg Hub** to the original location name.

RELATED LINKS

Steinberg Hub on page 70

Opening Recent Projects

To open a recently opened project, do one of the following:

- In the category bar of Steinberg Hub, click **Recent**, select a project from the projects list, and click **Open**.
- Select **File > Recent Projects** and select a recently opened project.

Re-Routing Missing Ports

If you open a Nuendo project that was created on a different system with other audio hardware, Nuendo tries to find matching audio inputs and outputs for the input/output busses. If Nuendo cannot resolve all audio/MIDI inputs and outputs that are used in the project, the **Missing Ports** dialog opens.

This allows you to manually re-route any ports specified in the project to ports that are available in your system.

NOTE

To improve the search for matching audio inputs and outputs for the input/output busses, you should use descriptive, generic names for your input and output ports.

RELATED LINKS

Renaming the Hardware Inputs and Outputs on page 29

Saving Project Files

You can save the active project as a project file. To keep your projects as manageable as possible, make sure that you save project files and all related files in the respective project folders.

- To save the project and specify a file name and location, open the **File** menu and select **Save As**.
- To save the project with its current name and location, open the **File** menu and select **Save**.

About the Auto Save Option

Nuendo can automatically save backup copies of all open project files with unsaved changes.

NOTE

Only the project files are backed up. If you want to include the files from the Pool and save your project in a different location, you must use the **Back up Project** function.

If you activate the **Auto Save** option (**File > Preferences > General**), Nuendo automatically saves backup copies of all open projects with unsaved changes. These backup copies are named "<project name>-xx.bak" where xx is an incremental number. Unsaved projects are backed up in a similar way as "UntitledX-xx.bak", with X being the incremental number for unsaved projects. All backup files are saved in the project folder.

- To specify the time intervals in which a backup copy is created, use the **Auto Save Interval** setting.
- To specify how many backup files are created with the Auto Save function, use the **Maximum Backup Files** option. When the maximum number of backup files is reached, the existing files are overwritten, starting with the oldest file.

Saving Project Files As a New Version

You can create and activate a new version of an active project file. This is useful if you are experimenting with edits and arrangements and want to be able to go back to a previous version at any time.

To save a new version of the active project, do one of the following:

- Select **File > Save New Version**.
- Press [Ctrl]/[Command]-[Alt]/[Option]-[S].

The new file is saved with the same name as the original project and an attached incremental number. For example, if your project is called "My Project," new versions are called "My Project-01", "My Project-02", and so on.

Reverting to the Last Saved Version

You can return to the last saved version and discard all changes that have been introduced.

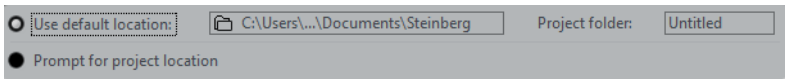
PROCEDURE

1. Select **File > Revert**.
2. In the warning message, click **Revert**.

   If you have recorded or created new audio files since the last version was saved, you are prompted to delete or keep the files.

Choosing a Project Location

In **Steinberg Hub**, you can specify where to save a project.



- To create a project in the default project location, select **Use default location**.

  In the **Project folder** field, you can specify a name for the project folder. If you do not specify a project folder here, the project is saved in a folder named `Untitled`.

- To change the default project location, click in the path field.

  A file dialog opens that allows you to specify a new default location.

- To create the project in a different location, select **Prompt for project location**.

  In the dialog that opens, specify a location and a project folder.

Removing Unused Audio Files

You can use the **Cleanup** function to locate and delete unused audio files in the project folders on your disk.

PREREQUISITE

Make sure that you have not moved or renamed files or folders without updating the project files to use the new paths. Also make sure that the project folder does not contain audio files that belong to projects that are not saved in the project folder.

PROCEDURE

1. Close all projects.
2. Select **File > Cleanup**.
3. Click the **Start** button.

   Nuendo scans the hard disks for project folders and lists all audio and image files that are not used by any project.

   NOTE

   You can also click the **Search Folder** button to select a specific folder for the Cleanup function. This is only recommended if you are sure that the folder contains no audio files that are used in other projects.

4. Select the files that you want to delete and click **Delete**.

Creating Self-Contained Projects

If you want to share your work or transfer it to another computer, your project must be self-contained.

The following functions facilitate this task:

- Select **Media > Prepare Archive** to verify that every clip that is referenced in the project is located in the project folder, and to take actions if that is not the case.
- Select **File > Back up Project** to create a new project folder where you can save the project file and the necessary work data. The original project remains unchanged.

Preparing Archives

The Prepare Archive function allows you to gather all files that are referenced by your project to ensure that these are in the project folder. This is useful if you want to move or archive your project.

PROCEDURE

1. Select **Media > Prepare Archive**.

   If your project references external files, you are prompted if you want to copy them to your working directory. If any processing has been applied, you must decide if you want to freeze edits.

2. Click **Proceed**.

RESULT

Your project is ready to be archived. You can move or copy the project folder to another location.

AFTER COMPLETING THIS TASK

You must copy audio files that reside within the project folder to the Audio folder or save them separately. You must also move your video clips manually, as videos are only referenced and not saved in the project folder.

Backing Up Projects

You can create a backup copy of your project. Backups only contain the necessary work data. All media files except the files from VST Sound archives are included as a copy.

PROCEDURE

1. Select **File > Back up Project**.
2. Select an empty folder or create a new one.
3. Make your settings in the **Back up Project Options** dialog and click **OK**.

RESULT

A copy of the project is saved in the new folder. The original project remains unaffected.

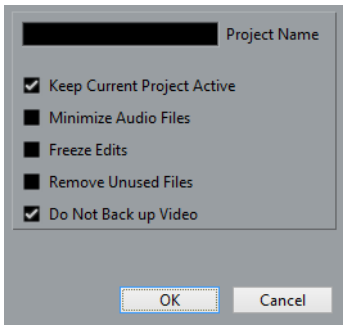
NOTE

VST Sound content provided by Steinberg is copy-protected and will not be included in the backup project. If you want to use a backup copy that uses VST Sound content on a different computer, make sure that the corresponding content is also available on that computer.

Back up Project Options Dialog

This dialog allows you to create a backup copy of your project.

- To open the **Back up Project Options** dialog, select **File > Back up Project**.



Project Name

Allows you to change the name of the backed up project.

Keep Current Project Active

Allows you to keep the current project active after clicking **OK**.

Minimize Audio Files

Allows you to include only the audio file portions that are actually used in the project. This can significantly reduce the size of the project folder if you are using small sections of large files. It also means that you cannot use other parts of the audio files if you continue working with the project in its new folder.

Freeze Edits

Allows you to freeze all edits and make all processing and applied effects permanent to each clip in the Pool.

Remove Unused Files

Allows you to remove unused files and to back up only the files that are actually used.

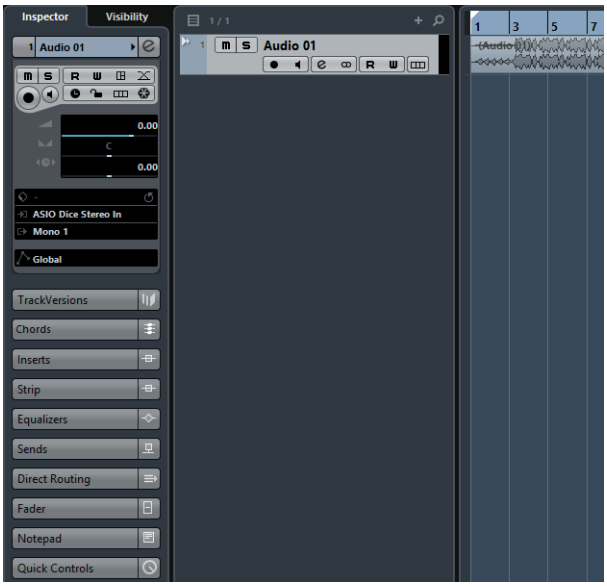
Do Not Back up Video

Allows you to exclude video clips on the video track or in the Pool of the current project.

Tracks

Tracks are the building blocks of your project. They allow you to import, add, record, and edit data (parts and events). Tracks are listed from top to bottom in the Track list and extend horizontally across the **Project** window. Each track is assigned to a particular channel strip in the MixConsole.

If you select a track in the **Project** window, the controls, settings, and parameters displayed in the Inspector and the track list allow you to control the track.



Audio Tracks

You can use audio tracks for recording and playing back audio events and audio parts. Each audio track has a corresponding audio channel in the MixConsole. An audio track can have any number of automation tracks for automating channel parameters, effect settings, etc.

- To add an audio track to your project, select **Project > Add Track > Audio**.

RELATED LINKS

Adding Tracks on page 142

Audio Track Inspector

The **Inspector** for audio tracks contains controls and parameters that allow you to edit your audio track.

The top section of the audio track **Inspector** contains the following basic track settings:

Track name

Audio 01

Click once to show/hide the basic track settings section. Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Open Device Panels

Allows you to create a device panel for the plug-in and device parameters of your track.

Auto Fades Settings

Opens a dialog where you can make separate audio fade settings for the track.

Record enable

Activates the track for recording.

Monitor

Routes incoming signals to the selected output.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Show Lanes

Divides the tracks in lanes.

Freeze Audio Channel

Allows you to freeze the audio channel.

Volume

Allows you to adjust the level for the track.

Pan

Allows you to adjust the panning of the track.

Delay

Allows you to adjust the playback timing of the track.

Load/Save/Reload Track Preset

Loads or saves a track preset or reverts the default presets.

Input Routing

Allows you to specify the input bus for the track.

Output Routing

Allows you to specify the output bus for the track.

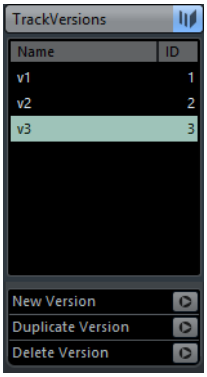
Track Automation Mode

Allows you to set the automation mode of the track.

Audio Track Inspector sections

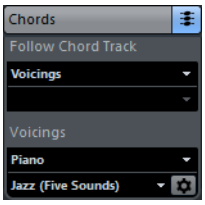
Apart from the basic track settings that are always shown, audio tracks provide other Inspector sections. These are described in the following sections.

TrackVersions



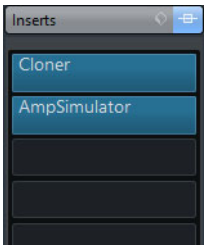
Allows you to create and edit **TrackVersions**.

Chords Section (NEK only)



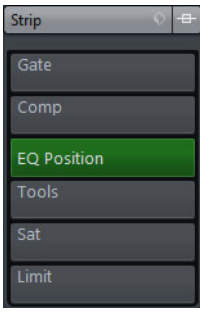
Allows you to specify how the track follows the chord track.

Inserts Section



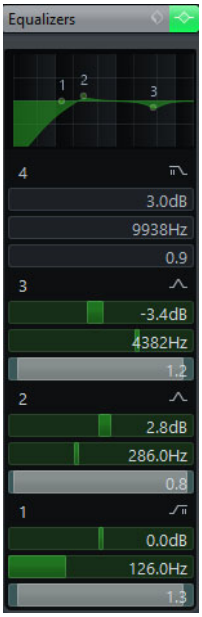
Allows you to add insert effects to the track.

Strip Section



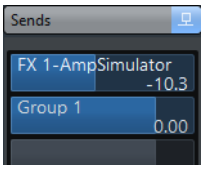
Allows you to set up the channel strip modules.

Equalizers Section



Allows you to adjust the EQs for the track. You can have up to four bands of EQ for each track.

Sends Section

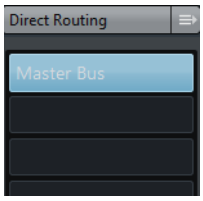


Allows you to route the track to one or several FX channels.

Cue Sends Section

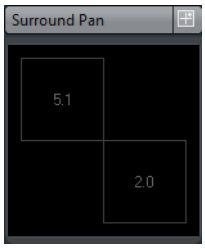
Allows you to route cue mixes to **Control Room** cues.

Direct Routing Section



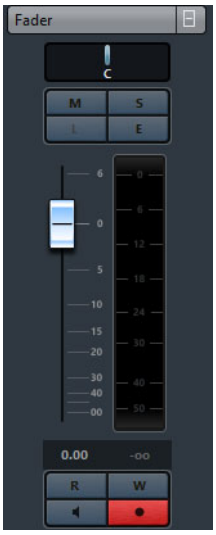
Allows you to set up direct routing.

Surround Pan Section



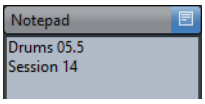
Shows the **SurroundPanner** for a track (if used).

Fader Section



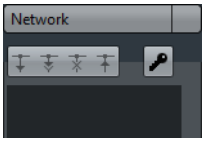
Shows a duplicate of the corresponding **MixConsole** channel.

Notepad Section



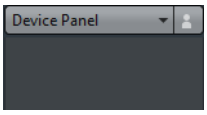
Allows you to enter notes about the track.

Network Section



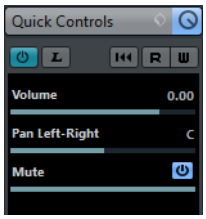
Shows the network connection of the track.

Device Panel Section



Allows you to display and use device panels.

Quick Controls Section



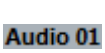
Allows you to configure quick controls to use remote devices, for example.

Audio Track Controls

The Track List for audio tracks contains controls and parameters that allow you to edit your audio track.

The track list for audio tracks contains the following controls:

Track name



Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Record enable

Activates the track for recording.

Monitor

Routes incoming signals to the selected output.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Show Lanes

Divides the tracks in lanes.

Bypass Inserts

Bypasses the inserts for the track.

Bypass EQs

Bypasses the equalizers for the track.

Bypass Sends

Bypasses the sends for the track.

Channel Configuration

Shows the channel configuration of the track.

Listen

The listen indicator is lit if the track is in listen mode.

Freeze Channel

Opens the **Freeze Channel Options** dialog that allows you to set the **Tail Size** time in seconds.

Load available update

This button lights up when other users have made changes to a track and committed them over the network to indicate that you can load the changes and update the project.

Automatically apply updates

If this button is activated, all changes that are committed to the tracks by other users are automatically applied.

Get exclusive access

If this button is activated, you have exclusive access to the track. To unlock a track, click the **Get exclusive access** button again.

Commit changes on this track

Commits the changes on this track to the network.

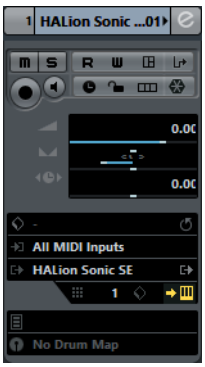
Instrument Tracks

You can use instrument tracks for dedicated VST instruments. Each instrument track has a corresponding instrument channel in the **MixConsole**. An instrument track can have any number of automation tracks.

- To add an instrument track to your project, select **Project > Add Track > Instrument**.

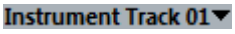
Instrument Track Inspector

The Inspector for instrument tracks contains controls and parameters that allow you to control your instrument track. It shows some of the sections from VST instrument channels and MIDI tracks.



The top section of the instrument track Inspector contains the following basic track settings:

Track name



Click once to show/hide the basic track settings section. Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Open Device Panels

Allows you to open the instrument panel.

Input Transformer

Opens the **Input Transformer** dialog that allows you to transform incoming MIDI events in realtime.

Record enable

Activates the track for recording.

Monitor

Routes incoming MIDI to the selected MIDI output. For this to work, activate **MIDI Thru Active** in the **Preferences** dialog (MIDI page).

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Freeze Instrument Channel

Allows you to freeze the instrument.

Volume

Allows you to adjust the level for the track.

Pan

Allows you to adjust the panning of the track.

Delay

Allows you to adjust the playback timing of the track.

Show Lanes

Divides the tracks in lanes.

Load/Save/Reload Track Preset

Loads or saves a track preset or reverts the default presets.

Input Routing

Allows you to specify the input bus for the track.

Output Routing

Allows you to specify the output bus for the track.

Edit Instrument

Allows you to open the instrument panel.

Programs

Jazz Grand Piano A

Allows you to select a program.

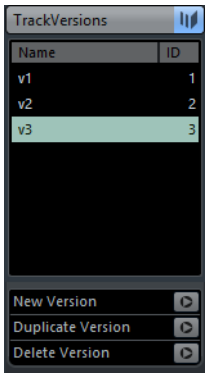
Drum Map (NEK only)

Allows you to select a drum map for the track.

Instrument Track Inspector Sections

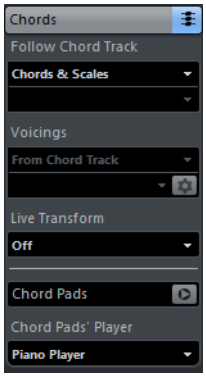
Apart from the basic track settings that are always shown, instrument tracks provide other Inspector sections. These are described in the following sections.

TrackVersions



Allows you to create and edit **TrackVersions**.

Chords Section (NEK only)

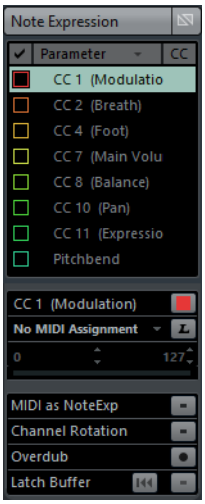


Allows you to specify how the track follows the chord track.

Expression Map Section (NEK only)

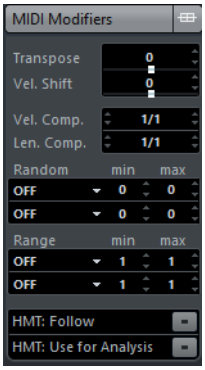
Allows you to use the **Expression Map** features.

Note Expression Section (NEK only)



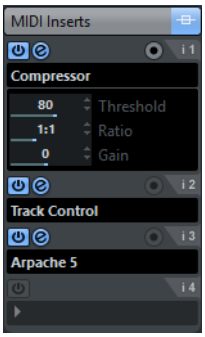
Allows you to work with the **Note Expression** features.

MIDI Modifiers Section



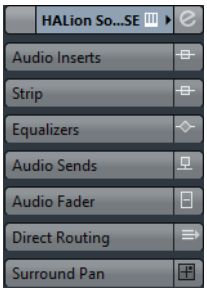
Allows you to transpose or adjust the velocity of the MIDI track events in realtime during playback.

MIDI Inserts Section



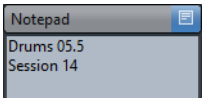
Allows you to add MIDI insert effects.

Instrument Section



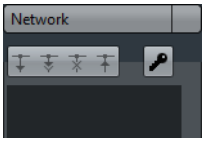
Shows the audio-related controls for the instrument.

Notepad Section



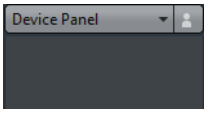
Allows you to enter notes about the track.

Network Section



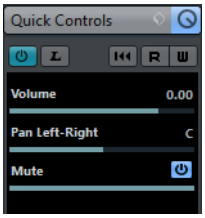
Shows the network connection of the track.

Device Panel Section



Allows you to display and use device panels.

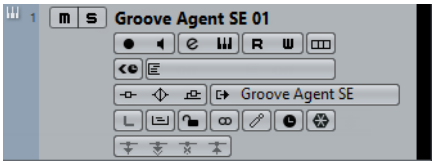
Quick Controls Section



Allows you to configure quick controls to use remote devices, for example.

Instrument Track Controls

The Track List for instrument tracks contains controls and parameters that allow you to edit your instrument track.



The track list for instrument tracks contains the following controls:

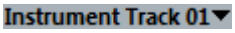
Mute

Mutes the track.

Solo

Solos the track.

Track name



Double-click to rename the track.

Record enable

Activates the track for recording.

Monitor

Allows you to route incoming MIDI signals to the selected MIDI output. For this to work, activate **MIDI Thru Active** in the **Preferences** dialog (MIDI page).

Edit

Opens the **Channel Settings** window for the track.

Edit Instrument

Allows you to open the instrument panel.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Show Lanes

Divides the tracks in lanes.

ASIO Latency Compensation

Moves all recorded events on the track by the current latency.

Programs

Allows you to select a program.

Bypass Inserts

Bypasses the inserts for the track.

Bypass EQs

Bypasses the equalizers for the track.

Bypass Sends

Bypasses the sends for the track.

Instrument

HALion Sonic SE

Allows you to select an instrument.

Listen

The listen indicator is lit if the track is in listen mode.

Edit In-Place

Allows you to edit MIDI events and parts on the track in the **Project** window.

Lock

Disables all editing of all events on the track.

Channel Configuration

Shows the channel configuration of the track.

Drum Map (NEK only)

Allows you to select a drum map for the track.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Freeze Channel

Opens the **Freeze Channel Options** dialog that allows you to set the **Tail Size** time in seconds.

Load available update

This button lights up when other users have made changes to a track and committed them over the network to indicate that you can load the changes and update the project.

Automatically apply updates

If this button is activated, all changes that are committed to the tracks by other users are automatically applied.

Get exclusive access

If this button is activated, you have exclusive access to the track. To unlock a track, click the **Get exclusive access** button again.

Commit changes on this track

Commits the changes on this track to the network.

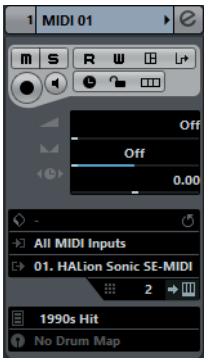
MIDI Tracks

You can use MIDI tracks for recording and playing back MIDI parts. Each MIDI track has a corresponding MIDI channel in the **MixConsole**. A MIDI track can have any number of automation tracks.

- To add a MIDI track to your project, select **Project > Add Track > MIDI**.

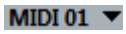
MIDI Track Inspector

The Inspector for MIDI tracks contains controls and parameters that allow you to control your MIDI track. These affect MIDI events in realtime, on playback, for example.



The top section of the MIDI track Inspector contains the following basic track settings:

Track name



Click once to show/hide the basic track settings section. Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Open Device Panels

Allows you to open the instrument panel.

Input Transformer

Opens the **Input Transformer** dialog that allows you to transform incoming MIDI events in realtime.

Record enable

Activates the track for recording.

Monitor

Routes incoming MIDI to the selected MIDI output. For this to work, activate **MIDI Thru Active** in the **Preferences** dialog (MIDI page).

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Show Lanes

Divides the tracks in lanes.

MIDI Volume

Allows you to adjust the MIDI volume for the track.

MIDI Pan

Allows you to adjust the MIDI pan for the track.

Delay

Allows you to adjust the playback timing of the track.

Load/Save/Reload Track Preset

Loads or saves a track preset or reverts the default presets.

Input Routing

Allows you to specify the input bus for the track.

Output Routing

Allows you to specify the output bus for the track.

Channel

Allows you to specify the MIDI channel.

Edit Instrument

Allows you to open the instrument panel.

Bank Selector

Off

Allows you to set a bank select message that is sent to your MIDI device.

Program Selector

Off

Allows you to set a program change message that is sent to your MIDI device.

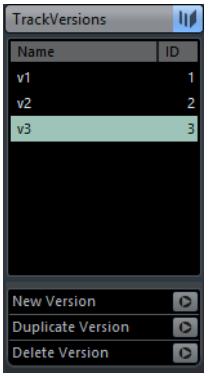
Drum Map (NEK only)

Allows you to select a drum map for the track.

MIDI Track Inspector Sections

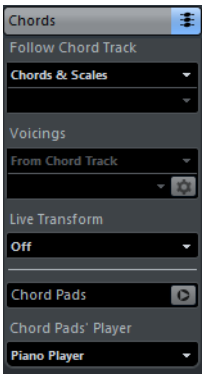
Apart from the basic track settings that are always shown, MIDI tracks provide other Inspector sections. These are described in the following sections.

TrackVersions



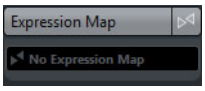
Allows you to create and edit **TrackVersions**.

Chords Section (NEK only)



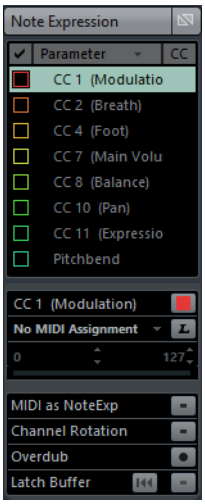
Allows you to specify how the track follows the chord track.

Expression Map Section (NEK only)



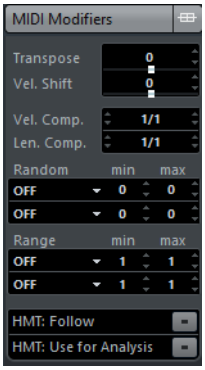
Allows you to use the **Expression Map** features.

Note Expression Section (NEK only)



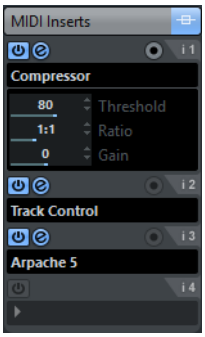
Allows you to work with the **Note Expression** features.

MIDI Modifiers Section



Allows you to transpose or adjust the velocity of the MIDI track events in realtime during playback.

MIDI Inserts Section

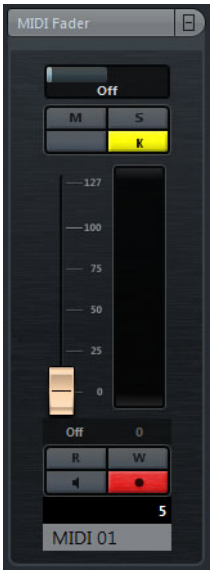


Allows you to add MIDI insert effects.

MIDI Sends Section

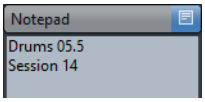
Allows you to add MIDI send effects.

MIDI Fader Section



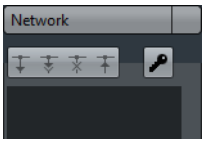
Shows a duplicate of the corresponding **MixConsole** channel.

Notepad Section



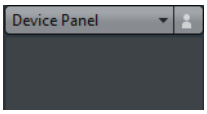
Allows you to enter notes about the track.

Network Section



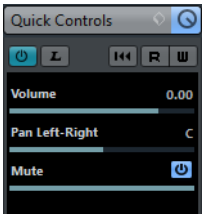
Shows the network connection of the track.

Device Panel Section



Allows you to display and use device panels.

Quick Controls Section



Allows you to configure quick controls to use remote devices, for example.

MIDI Track Controls

The Track List for MIDI tracks contains controls and parameters that allow you to edit your MIDI track.

The track list for MIDI tracks contains the following controls:

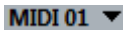
Mute

Mutes the track.

Solo

Solos the track.

Track name



Click once to show/hide the basic track settings section. Double-click to rename the track.

Record enable

Activates the track for recording.

Monitor

Allows you to route incoming MIDI signals to the selected MIDI output. For this to work, activate **MIDI Thru Active** in the **Preferences** dialog (MIDI page).

Channel

Allows you to specify the MIDI channel.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Show Lanes

Divides the tracks in lanes.

Output

HALion Sonic SE

Allows you to specify the output for the track.

Programs

Hard Grand Piano

Allows you to select a program.

Edit In-Place

Allows you to edit MIDI events and parts on the track in the **Project** window.

Bypass Inserts

Bypasses the inserts for the track.

Bypass Sends

Bypasses the sends for the track.

Lock

Disables all editing of all events on the track.

Edit

Opens the **Channel Settings** window for the track.

Drum Map (NEK only)

Allows you to select a drum map for the track.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Load available update

This button lights up when other users have made changes to a track and committed them over the network to indicate that you can load the changes and update the project.

Automatically apply updates

If this button is activated, all changes that are committed to the tracks by other users are automatically applied.

Get exclusive access

If this button is activated, you have exclusive access to the track. To unlock a track, click the **Get exclusive access** button again.

Commit changes on this track

Commits the changes on this track to the network.

ASIO Latency Compensation

Moves all recorded events on the track by the current latency.

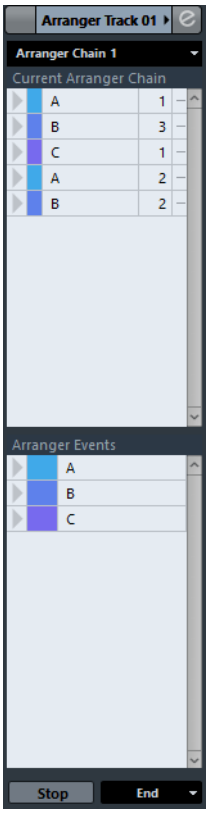
Arranger Track

You can use the arranger track for arranging your project by marking out sections and determining in which order they are to be played back.

- To add the arranger track to your project, select **Project > Add Track > Arranger**.

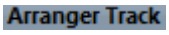
Arranger Track Inspector

The arranger track Inspector displays the lists of available arranger chains and arranger events.



The arranger track Inspector contains the following settings:

Track Name

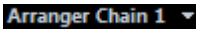


Double-click to rename the track.

Edit

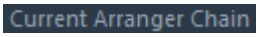
Opens the Arranger Editor.

Select Active Arranger Chain + Function



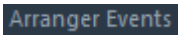
Allows you to select the active arranger chain, to rename it, to create a new one, to duplicate or to flatten it.

Current Arranger Chain



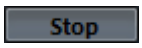
Shows the active arranger chain.

Arranger Events



Lists all arranger events in your project. Click the arrow for an arranger event to play it back and start the live mode.

Stop



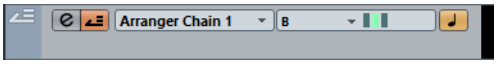
Allows you to stop the live mode.

Jump mode

In this pop-up menu you can define how long the active arranger event is played before jumping to the next one.

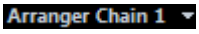
Arranger Track Controls

The Track List for the arranger track contains controls and parameters that allow you to edit the arranger track.



The track list for the arranger track contains the following controls:

Select Active Arranger Chain



Allows you to select the active arranger chain.

Current Item/Current Repeat

Displays which arranger event and which repeat is active.

Activate Arranger Mode

Allows you to activate and deactivate the arranger mode.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Edit

Opens the Arranger Editor for the track.

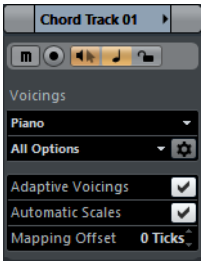
Chord Track (NEK only)

You can use the chord track for adding chord and scale events to your project. These can transform the pitches of other events.

- To add the chord track to your project, select **Project > Add Track > Chord**.

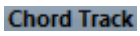
Chord Track Inspector

The chord track Inspector contains a number of settings for the chord events.



The top section of the chord track Inspector contains the following settings:

Track name



Click to show/hide the basic track settings section.

Mute

Mutes the track.

Record enable

Activates the track for recording.

Acoustic Feedback

Allows you to audition the events on the chord track. For this to work, you need to select a track for auditioning in the track list.

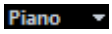
Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

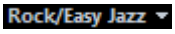
Disables all editing of all events on the track.

Voicing library



Allows you to set up a voicing library for the track.

Voicing library subset

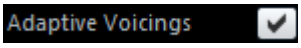


Allows you to select a library subset.

Configure voicing parameters

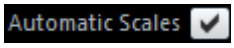
Allows you to configure your own voicing parameters for a specific voicing scheme.

Adaptive Voicings



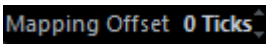
Activate this to set the voicings automatically.

Automatic Scales



Activate this to let the program create scale events automatically.

Mapping Offset

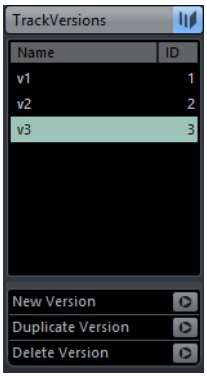


Allows you to specify an offset value to make sure that chord events also affect the MIDI notes that have been triggered too early (enter a negative value) or too late (enter a positive value).

Chord Track Inspector Sections

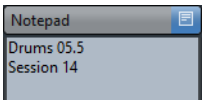
Apart from the basic track settings that are always shown, the chord track provides other Inspector sections. These are described in the following sections.

TrackVersions



Allows you to create and edit **TrackVersions**.

Notepad Section



Allows you to enter notes about the track.

Chord Track Controls

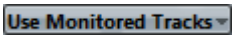
The Track List for the chord track contains controls and parameters that allow you to edit the chord track.

The track list for chord tracks contains the following controls:

Mute

Mutes the track.

Select Track for Auditioning



Allows you to select a track for auditioning the chord events.

Record Enable

Allows you to record chord events.

Resolve Display Conflicts

Allows you to show all chord events on the track properly, even at low horizontal zoom levels.

Show Scales

Allows you to show the scale lane in the lower part of the chord track.

Lock

Disables all editing of all events on the track.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

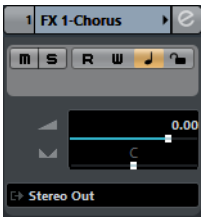
FX Channel Tracks

You can use FX channel tracks for adding send effects. Each FX channel can contain up to eight effect processors. By routing sends from an audio channel to an FX channel, you send audio from the audio channel to the effects on the FX channel. All FX channel tracks are automatically placed in a special FX channel folder in the track list, for easy management. Each FX channel has a corresponding channel in the MixConsole. An FX channel track can have any number of automation tracks.

- To add an FX channel track to your project, select **Project > Add Track > FX Channel**.

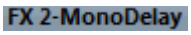
FX Channel Track Inspector

The Inspector for FX channel tracks shows the settings for the FX channel. When you select the folder track instead, the Inspector shows the folder and the FX channels it contains. You can click one of the FX channels shown in the folder to have the Inspector show the settings for that FX channel.



The FX channel track Inspector contains the following basic track settings:

Track name



Click once to show/hide the basic track settings section. Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Volume

Allows you to adjust the level for the track.

Pan

Allows you to adjust the panning of the track.

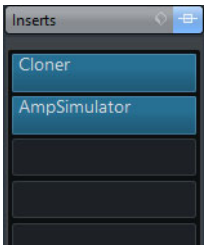
Output Routing

Allows you to specify the output bus for the track.

FX Channel Track Inspector Sections

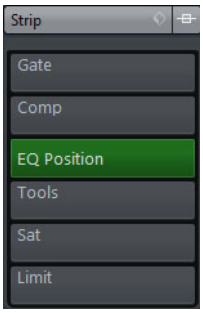
Apart from the basic track settings that are always shown, FX channel tracks provide other Inspector sections. These are described in the following sections.

Inserts Section



Allows you to add insert effects to the track.

Strip Section

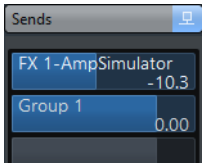


Allows you to set up the channel strip modules.

Equalizers Section

Allows you to adjust the EQs for the track. You can have up to four bands of EQ for each track.

Sends Section

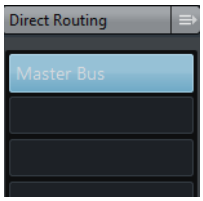


Allows you to route the track to one or several FX channels.

Cue Sends Section

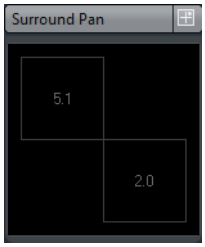
Allows you to route cue mixes to **Control Room** cues.

Direct Routing Section



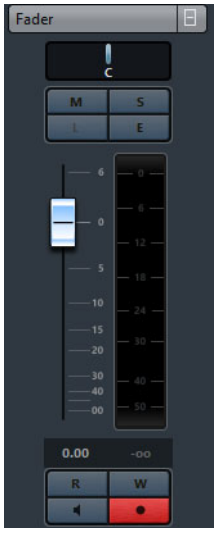
Allows you to set up direct routing.

Surround Pan Section



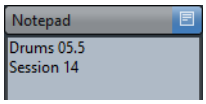
Shows the **SurroundPanner** for a track (if used).

Fader Section



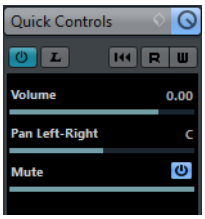
Shows a duplicate of the corresponding **MixConsole** channel.

Notepad Section



Allows you to enter notes about the track.

Quick Controls Section



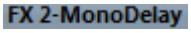
Allows you to configure quick controls to use remote devices, for example.

FX Channel Track Controls

The Track List for FX channel tracks contains controls and parameters that allow you to edit the settings for the effect.

The track list for FX channel tracks contains the following controls:

Track name



Click once to show/hide the basic track settings section. Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Mute Automation

Deactivates the automation read function for the selected parameter.

Automation parameter

Allows you to select a parameter for automation.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Bypass Inserts

Bypasses the inserts for the track.

Bypass EQs

Bypasses the equalizers for the track.

Bypass Sends

Bypasses the sends for the track.

Channel Configuration

Shows the channel configuration of the track.

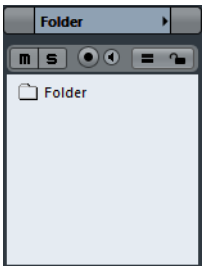
Folder Tracks

Folder tracks function as containers for other tracks, making it easier to organize and manage the track structure. They also allow you to edit several tracks at the same time.

- To add a folder track to your project, select **Project > Add Track > Folder**.

Folder Track Inspector

The Inspector for folder tracks shows the folder and its underlying track, much like a folder structure in the Windows Explorer or the Mac OS X Finder. When you select the one of the tracks shown under the folder, the Inspector shows the settings for that track.



The folder track Inspector contains the following basic track settings:

Track name

Double-click to rename the track.

Mute

Mutes the track.

Solo

Solos the track.

Record enable

Activates the track for recording.

Monitor

Routes incoming signals to the selected output.

Group Editing

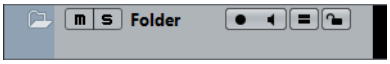
Allows you to activate the group editing mode.

Lock

Disables all editing of all events on the track.

Folder Track Controls

The Track List for folder tracks contains controls and parameters that allow you to edit all tracks in the folder.



The track list for folder tracks contains the following controls:

Expand/Collapse

Shows/hides the tracks in the folder. Hidden tracks are played back as usual.

Track name

Folder

Double-click to rename the track.

Mute

Mutes the track.

Solo

Solos the track.

Record enable

Activates the track for recording.

Monitor

Routes incoming signals to the selected output.

Group Editing

Allows you to activate the group editing mode.

Lock

Disables all editing of all events on the track.

Group Channel Tracks

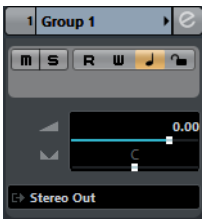
You can use group channel tracks to create a submix of several audio channels and apply the same effects to them. A group channel track contains no events as such, but displays settings and automation for the corresponding group channel.

All group channel tracks are automatically placed in a special group track folder in the track list, for easy management. Each group channel track has a corresponding channel in the MixConsole. A group channel track can have any number of automation tracks.

- To add a group channel track to your project, select **Project > Add Track > Group Channel**.

Group Channel Track Inspector

The Inspector for group channel tracks shows the settings for the group channel.



The group channel track Inspector contains the following basic track settings:

Track name

Group 1 — Click once to show/hide the basic track settings section. Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute Automation

Deactivates the automation read function for the selected parameter.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Volume

Allows you to adjust the level for the track.

Pan

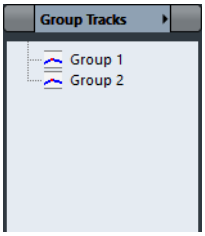
Allows you to adjust the panning of the track.

Output Routing

Allows you to specify the output bus for the track.

NOTE

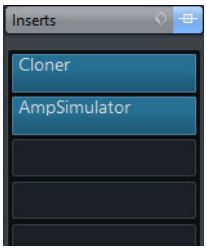
When you select the group folder track instead, the Inspector shows the folder and the group channels it contains. You can click one of the group channels shown in the folder, to have the Inspector show the settings for that group channel.



Group Channel Track Inspector sections

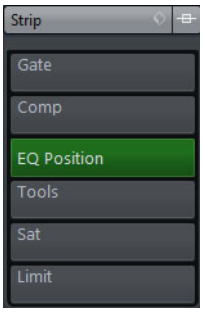
Apart from the basic track settings that are always shown, group channel tracks provide other Inspector sections. These are described in the following sections.

Inserts Section



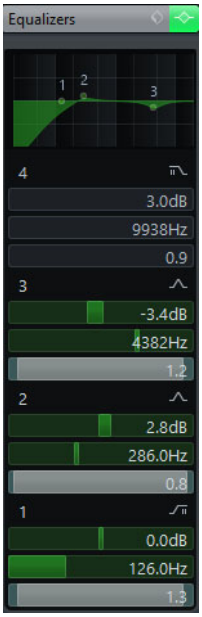
Allows you to add insert effects to the track.

Strip Section



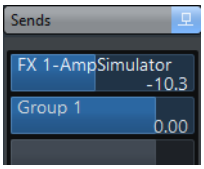
Allows you to set up the channel strip modules.

Equalizers Section



Allows you to adjust the EQs for the track. You can have up to four bands of EQ for each track.

Sends Section

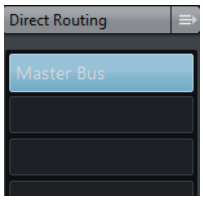


Allows you to route the track to one or several FX channels.

Cue Sends Section

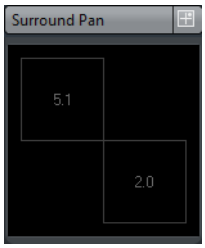
Allows you to route cue mixes to **Control Room** cues.

Direct Routing Section



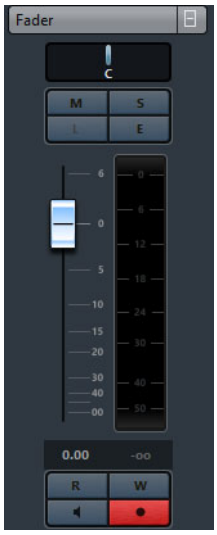
Allows you to set up direct routing.

Surround Pan Section



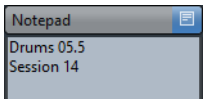
Shows the **SurroundPanner** for a track (if used).

Fader Section



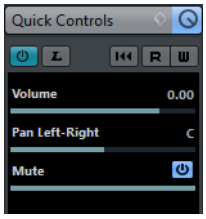
Shows a duplicate of the corresponding **MixConsole** channel.

Notepad Section



Allows you to enter notes about the track.

Quick Controls Section



Allows you to configure quick controls to use remote devices, for example.

Group Channel Track Controls

The Track List for group channel tracks contains controls and parameters that allow you to edit the settings for the group.

The track list for group channel tracks contains the following controls:

Track name

Group 1 — Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

Mute

Mutes the track.

Solo

Solos the track.

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Mute Automation

Deactivates the automation read function for the selected parameter.

Automation parameter

Volume -38.2 — Allows you to select a parameter for automation.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

Bypass Inserts

Bypasses the inserts for the track.

Bypass EQs

Bypasses the equalizers for the track.

Bypass Sends

Bypasses the sends for the track.

Channel Configuration

Shows the channel configuration of the track.

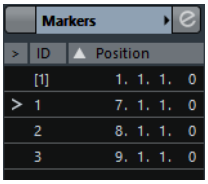
Marker Track

You can use the marker track to add and edit markers that help you to locate certain positions quickly.

- To add the marker track to your project, select **Project > Add Track > Marker**.

Marker Track Inspector

The marker track Inspector displays the marker list.



The marker track Inspector contains the following settings:

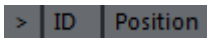
Track name

Double-click to rename the track.

Edit

Opens the **Channel Settings** window for the track.

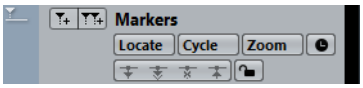
Marker attributes



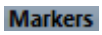
Shows the markers, their IDs, and time positions. Click in the leftmost column for a marker to move the project cursor to the marker position.

Marker Track Controls

The track list for the marker track contains controls and parameters that allow you to edit the marker track.



Track name



Double-click to rename the track.

Locate

Allows you to move the project cursor to the selected marker position.

Cycle

Allows you to select a cycle marker.

Zoom

Allows you to zoom in a cycle marker.

Add Marker

Allows you to add a position marker at the project cursor position.

Add Cycle Marker

Allows you to add a cycle marker at the project cursor position.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Load available update

This button lights up when other users have made changes to a track and committed them over the network to indicate that you can load the changes and update the project.

Automatically apply updates

If this button is activated, all changes that are committed to the tracks by other users are automatically applied.

Get exclusive access

If this button is activated, you have exclusive access to the track. To unlock a track, click the **Get exclusive access** button again.

Commit changes on this track

Commits the changes on this track to the network.

Lock

Disables all editing of all events on the track.

Ruler Track

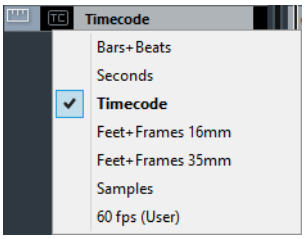
You can use ruler tracks to show several rulers with different display formats for the timeline. This is completely independent from the main ruler, as well as rulers and position displays in other windows.

- To add a ruler track to your project, select **Project > Add Track > Ruler**.

Ruler Track Controls

In the track list for ruler tracks you can change the display format for the ruler.

Right-click the ruler to open the display format pop-up menu.



The following display formats are available:

Bars+Beats

Activates a display format of bars, beats, sixteenth notes, and ticks. By default there are 120 ticks per sixteenth note, but you can adjust this with the **MIDI Display Resolution** setting in the **Preferences** dialog (MIDI page).

Seconds

Activates a display format of hours, minutes, seconds, and milliseconds.

Timecode

Activates a display format of hours, minutes, seconds, and frames. The number of frames per second (fps) is set in the **Project Setup** dialog with the **Frame Rate** pop-up menu. You can also display subframes by activating **Show Timecode Subframes** in the **Preferences** dialog (Transport page).

Feet+Frames 16 mm

Feet and frames, with 40 frames per foot. To let the beginning of a project always start at 0'00, regardless of any **Start** offset settings in the **Project Setup** dialog, activate **Feet'n'Frames Count from Project Start** (**File > Preferences > Transport**).

Feet+Frames 35 mm

Feet, frames, and 1/4 frames, with 16 frames per foot. To let the beginning of a project always start at 0'00, regardless of any **Start** offset settings in the **Project Setup** dialog, activate **Feet'n'Frames Count from Project Start** (**File > Preferences > Transport**).

Samples

Activates a display format of samples.

fps (User)

Activates a display format of hours, minutes, seconds, and frames, with a user-definable number of frames per second. You can also display subframes by activating **Show Timecode Subframes** (**File > Preferences > Transport**). On the **Transport** page, you can also set the frame rate.

NOTE

Ruler tracks are not affected by the display format setting in the **Project Setup** dialog.

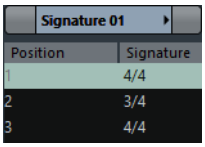
Signature Track

You can use the signature track to add and edit signature events. The signature track's background always shows bars. This is independent of the ruler display format setting.

- To add the signature track to your project, select **Project > Add Track > Signature**.

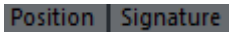
Signature Track Inspector

The signature track Inspector displays a list of all time signature events.



The signature track Inspector contains the following settings:

Signatures list



Shows a list of all signature events that allows you to edit signature events and their positions.

Signature Track Controls

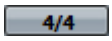
The track list for the signature track contains controls and parameters that allow you to edit the signature track.

The track list for signature tracks contains the following controls:

Lock

Disables all editing of all events on the track.

Current Time Signature



Allows you to change the time signature at the project cursor position.

Open Process Bars Dialog

Allows you to open the **Process Bars** dialog.

Tempo Track

You can use the tempo track to create tempo changes within a project.

- To add a tempo track to your project, select **Project > Add Track > Tempo**.

Tempo Track Inspector

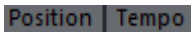
The tempo track Inspector displays a list of all tempo events.

The tempo track Inspector contains the following settings:

Edit

Opens the Tempo Track Editor.

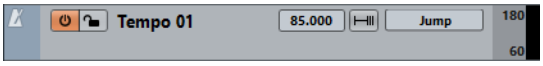
Tempo event list



Shows a list of all tempo events that allows you to edit tempo events and their positions.

Tempo Track Controls

The track list for the tempo track contains controls and parameters that allow you to edit the tempo track.



The track list for tempo tracks contains the following controls:

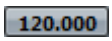
Activate Tempo Track

Allows you to activate the tempo track. In this mode, the tempo cannot be changed on the Transport panel.

Lock

Disables all editing of all events on the track.

Current Tempo



Allows you to change the tempo at the project cursor position.

Open Process Tempo Dialog

Allows you to open the **Process Tempo** dialog.

New Tempo Points Type

Allows you to specify whether the tempo should change gradually (Ramp) or instantly (Jump) from the previous curve point to the new one.

Visible Tempo Upper/Lower Limit

Allows you to specify the display range. This changes the display scale of the tempo track, but not the tempo setting.

Transpose Track

You can use the transpose track to set global key changes.

- To add the transpose track to your project, select **Project > Add Track > Transpose**.

Transpose Track Inspector

The transpose track Inspector contains a number of parameters to control the transpose track.

The transpose track Inspector contains the following settings:

Keep Transpose in Octave Range

Allows you to keep the transposition in the octave range and ensures that nothing is transposed by more than seven semitones.

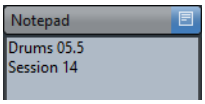
Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Transpose Track Inspector sections

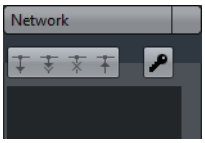
Apart from the basic track settings that are always shown, the transpose track provides other Inspector sections. These are described in the following sections.

Notepad Section



Allows you to enter notes about the track.

Network Section



Shows the network connection of the track.

Transpose Track Controls

The track list for the transpose track contains parameters that allow you to control the transpose track.

The track list for the transpose track contains the following settings:

Mute Transpose Events

Mutes the track.

Keep Transpose in Octave Range

Allows you to keep the transposition in the octave range and ensures that nothing is transposed by more than seven semitones.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock

Disables all editing of all events on the track.

VCA Fader Track

You can use a VCA fader track to add VCA faders to your project.

- To add a VCA fader track to your project, select **Project > Add Track > VCA Fader**.

RELATED LINKS

VCA Faders on page 368
VCA Fader Automation on page 371
Automation on page 658

VCA Fader Track Inspector

The **Inspector** for VCA fader tracks shows the settings for the VCA faders.

The **Inspector** contains the following basic track settings:

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

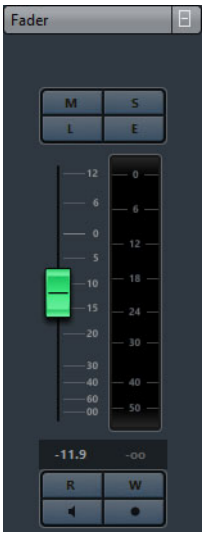
Lock

Disables all editing of all events on the track.

Volume

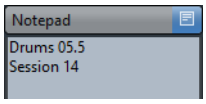
Allows you to adjust the level for the track.

Fader Section



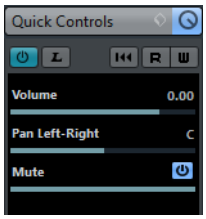
Shows a duplicate of the corresponding **MixConsole** channel.

Notepad Section



Allows you to enter notes about the track.

Quick Controls Section



Allows you to configure quick controls to use remote devices, for example.

VCA Fader Track Controls

The track list for VCA fader tracks contains controls and parameters that allow you to edit the settings for the VCA fader.

The track list for VCA fader tracks contains the following controls:

Read Automation

Allows you to read track automation.

Write Automation

Allows you to write track automation.

Lock

Disables all editing of all events on the track.

Toggle Time Base

Switches between musical (tempo related) and linear (time related) time base for the track.

Video Track

You can use the video track to play back video events. Video files are displayed as events/clips on the video track, with thumbnails representing the frames in the film.

- To add a video track to your project, select **Project > Add Track > Video**.

Video Track Inspector

The video track Inspector contains a number of parameters to control the video track.

The video track Inspector contains the following settings:

Reveal Video Window

Opens the **Video Player** window.

Mute Video Track

Mutes the track.

Lock

Disables all editing of all events on the track.

Show Frame Numbers

Allows you to show each thumbnail with the corresponding video frame number.

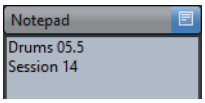
Show Thumbnails

Allows you to activate/deactivate the thumbnails of a video track.

Video Track Inspector Section

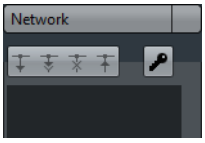
Apart from the basic track settings that are always shown, the video track provides an other Inspector section. This is described in the following section.

Notepad Section



Allows you to enter notes about the track.

Network Section



Shows the network connection of the track.

Video Track Controls

The track list for the video track contains a number of parameters to control the video track.

The track list for the video track contains the following settings:

Mute Video Track

Mutes the track.

Lock

Disables all editing of all events on the track.

Show Thumbnails

Allows you to activate/deactivate the thumbnails of a video track.

Show Frame Numbers

Allows you to show each thumbnail with the corresponding video frame number.

Load available update

This button lights up when other users have made changes to a track and committed them over the network to indicate that you can load the changes and update the project.

Automatically apply updates

If this button is activated, all changes that are committed to the tracks by other users are automatically applied.

Get exclusive access

If this button is activated, you have exclusive access to the track. To unlock a track, click the **Get exclusive access** button again.

Commit changes on this track

Commits the changes on this track to the network.

Loudness Track

You can use the loudness track to record and display the short-term loudness as a curve.

- To add the loudness track to your project, select **Project > Add Track > Loudness**.

Loudness Track Inspector

The loudness track Inspector shows the most important loudness meter displays.

The loudness track Inspector shows the following values:

Short Term

Shows the loudness measured over a duration of 3 ms.

Integrated

Shows the average loudness measured from start to stop. The recommended value for the integrated loudness is -23 LUFS. This absolute value is the reference point for the relative LU scale where -23 LUFS equals 0 LU.

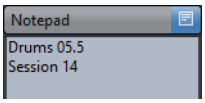
Range

Shows the dynamic range of the audio measured from start to stop. This value helps you to decide how much dynamic compression you can apply. The range that is recommended for highly dynamic audio like film music is 20 LU.

True Peak

Shows the true peak level of the audio. The maximum permitted true peak level in production is -1 dB.

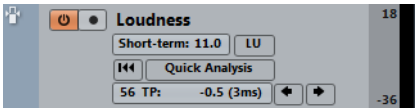
Notepad Section



Allows you to enter notes about the track.

Loudness Track Controls

The track list for the loudness track contains a number of parameters to control the loudness track



The track list for the loudness track contains the following settings:

Activate Loudness Calculation

Enables the loudness calculation.

Enable Recording of Loudness Curve

Enables the creation of a loudness curve in real-time at the cursor position during playback.

Short Term

Short-term: -29.0

Shows the loudness measured over a duration of 3 ms.

LUFS/LU

LUFS

Allows you to switch the loudness unit from LUFS (Loudness Unit, absolute values) to LU (relative values).

Clear Loudness Curve

Allows you to clear the loudness curve on the loudness track.

Quick Analysis

Quick Analysis

Enables the creation of a loudness curve for a defined section in off-line processing.

Count of true peak value exceeding reference level

56 TP:

Shows the count of true peak values that are exceeding the reference level.

True peak level of cursor

-0.5 (3ms)

Shows the true peak level at the cursor position.

Jump to previous/next true peak value exceeding reference level

Moves the cursor to the previous/next true peak position that exceeds the reference level.

Visible Loudness - Upper/Lower limit

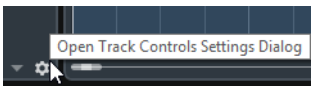
-59

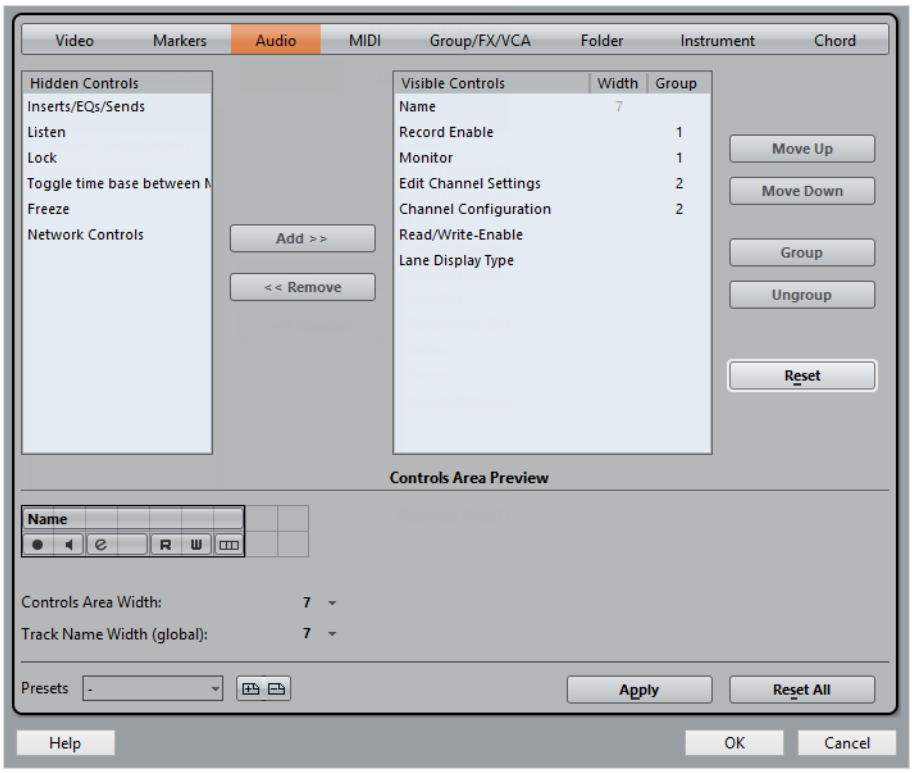
Allows you to specify the display range. Note that this does not change the measured loudness, but changes the display scale of the loudness track.

Customizing Track Controls

For each track type you can configure which track controls are shown in the track list. You can also specify the order of controls and group controls so that they are always shown adjacent to each other.

- To open the **Track Controls Settings** dialog, right-click a track in the track list and select **Track Controls Settings** from the context menu, or click **Open Track Controls Settings Dialog** in the bottom right corner of the track list.





Track Type

Allows you to select the track type to which your settings are applied.

Hidden Controls

This section displays controls currently hidden in the track list.

Visible Controls

This section displays controls currently visible in the track list.

Width

If you click in this column, you can set the maximum length for the track name.

Group

Displays the group number.

Add

Allows you to move an item selected in the hidden controls list to the list of visible controls.

Remove

Allows you to move an item selected in the visible controls list to the list of hidden controls. All controls can be removed except the **Mute** and **Solo** buttons.

Move Up/Move Down

Allows you to change the order of an item in the list of visible controls.

Group

Allows you to group two or more controls selected in the visible controls list that are adjacent to each other. This ensures that they are always positioned side by side in the track list.

Ungroup

Allows you to ungroup grouped controls in the visible controls list. To remove an entire group, select the first (topmost) element belonging to this group and click the **Ungroup** button.

Reset

Allows you to restore all default track controls settings for the selected track type.

Controls Area Preview

Shows a preview of the customized track controls.

Controls Area Width

Allows you to determine the width of the track control area for the selected track type. In the **Controls Area Preview**, this area is shown with a black frame.

Presets

Allows you to save track controls settings as presets. To recall a preset, click the **Switch Presets** button in the bottom right corner of the track list. The name of the selected preset is shown in the left corner.

Track Name Width (global)

Allows you to determine the global name width for all track types.

Apply

Applies your settings.

Reset All

Allows you to restore all default track controls settings for all track types.

Track Handling

Adding Tracks

PROCEDURE

1. Select **Project > Add Track**, or right-click the track list.
2. Do one of the following:
   - Add a track of a specific type.

     For some track types a dialog opens that allows you to insert several tracks at once.
   - To add a track based on a track preset, select **Add Track Using Track Preset**.

     The **Choose Track Preset** dialog opens that allows you to select a track preset. The number and type of added tracks depends on the selected track preset.

RESULT

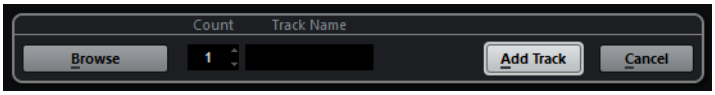
The track is added to the project.

RELATED LINKS

Add Track Dialog on page 142
Track Presets on page 167

Add Track Dialog

The **Add Track** dialog opens when you add audio, MIDI, group/FX/VCA channels, or instrument tracks.



Browse

Expands the dialog and allows you to select a track preset for the track.

Count

Allows you to enter the number of tracks that you want to add.

Configuration

Allows you to set the channel configuration. Audio-related tracks can be configured as mono, stereo, or surround tracks, with almost any combination of channels (LCRS, 5.1, 7.1, 10.2, etc.).

Speakers

Shows the speaker names according to the track configuration.

Track Name

Allows you to specify a track name.

Add Track

Adds the track and closes the dialog.

RELATED LINKS

Track Presets on page 167

Removing Tracks

You can remove selected or empty tracks from the track list.

- To remove selected tracks, select **Project > Remove Selected Tracks** or right-click the track that you want to remove, and from the context menu select **Remove Selected Tracks**.

  NOTE

  If you delete tracks that are not empty, a warning message is displayed. You can deactivate this message. To reactivate the message, activate **Display Warning before Deleting Non-Empty Tracks** in the **Preferences** dialog on the **Editing** page.

- To remove empty tracks, select **Project > Remove Empty Tracks**.

Moving Tracks in the Track List

You can move tracks up or down in the track list.

PROCEDURE

- Select a track and drag it up or down in the track list.

Renaming Tracks

PROCEDURE

1. Double-click the track name and type in a new name for the track.
2. Press [Return].

   If you want all events on the track to get the same name, hold down any modifier key and press [Return].

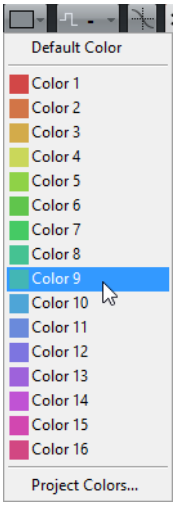
AFTER COMPLETING THIS TASK

If the **Parts Get Track Names** option (**File > Preferences > Editing**) is activated, and you move an event from one track to another, the moved event will automatically be named according to its new track.

Coloring Tracks

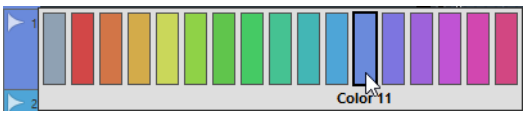
All new tracks are automatically assigned a color according to the **Auto Track Color Mode** settings. However, you can change the track color manually.

- To change the color for the selected track, use the **Select Colors** pop-up menu on the toolbar.



- You can also use the Track Color Selector. In the **Inspector**, click the arrow to the right of the track name and select a color.

In the track list, [Ctrl]/[Command]-click in the left area and select a color.



- To control which colors are used for new tracks, select **File > Preferences > Event Display > Tracks** and edit the **Auto Track Color Mode** settings.

Showing Track Pictures

You can add pictures to tracks to recognize your tracks easily. Track pictures are available for audio, instrument, MIDI, FX channel and group channel tracks.

PREREQUISITE

Adjust the track height to at least 2 rows.

PROCEDURE

1. Right-click any track in the track list.
2. From the track list context menu, select **Show Track Pictures**.

If you move the mouse to the left on a track, a highlighted rectangle appears.

AFTER COMPLETING THIS TASK

Double-click the rectangle to open the **Track Pictures Browser** and set up a track picture.

RELATED LINKS

Track Pictures Browser on page 145

Track Pictures Browser

The **Track Pictures Browser** allows you to set up and select pictures that can be shown in the track list and in the MixConsole. Track pictures are useful to recognize tracks and channels easily. You can select pictures from the factory content or add new ones to the user library.

- To open the **Track Pictures Browser** for a track, double-click in the lower left side of the track list.

Factory

Shows the factory content in the pictures browser.

Pictures Browser

Shows the pictures that you can assign to the selected track/channel.

User

Shows your user content in the pictures browser.

Import

Opens a file dialog that allows you to select pictures in bmp, jpeg, or png format and add them to the user library.

Remove Selected Pictures from User Library

Removes the selected picture from the user library.

Reset Current Picture

Removes the picture from the selected track/channel.

Show/Hide Preview

Opens/Closes a section with further color and zoom settings.

Track Picture Preview

Shows the current track picture. When you zoom in the picture, you can drag it with the mouse to change its visible part.

Track Color

Opens the **Track Color Selector**. Click the rectangle to change the track color.

Intensity

Allows you to apply the track color to the track picture and set the color intensity.

Zoom

Allows you to change the size of the track picture.

Rotate

Allows you to rotate the track picture.

Setting the Track Height

You can enlarge the track height to show the events on the track in detail, or you can decrease the height of several tracks to get a better overview of your project.

- To change the height of an individual track, click its lower border in the track list and drag up or down.

- To change the height of all tracks simultaneously, hold down [Ctrl]/[Command], click the lower border of one track, and drag up or down.
- To set the number of tracks to view in the **Project** window, use the track zoom menu.
- To set the track height automatically when you select a track, click **Edit > Enlarge Selected Track**.

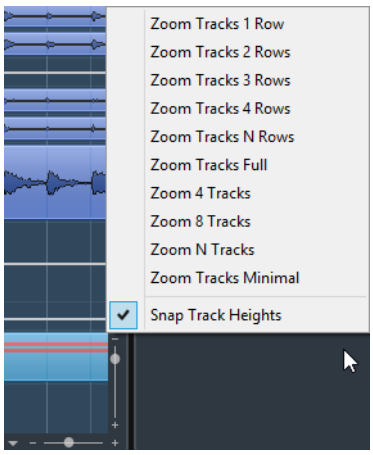
RELATED LINKS

Track Zoom Menu on page 147
Customizing Track Controls on page 139

Track Zoom Menu

The track zoom menu allows you to set the number of tracks and the track height in the **Project** window.

- To open the track zoom menu in the lower right of the **Project** window, click the arrow button above the vertical zoom control.



The following options are available:

Zoom Tracks x Rows

Zooms all track heights to show the specified number of rows.

Zoom Tracks Full

Zooms all tracks to fit in the active **Project** window.

Zoom x Tracks

Zooms the specified number of tracks to fit in the active **Project** window.

Zoom N Tracks

Allows you to set the number of tracks to fit in the active **Project** window.

Zoom Tracks Minimal

Zooms all track heights to the minimum size.

Snap Track Heights

Changes the track height in fixed increments when you resize it.

Selecting Tracks

- To select a track, click on it in the track list.
- To select several tracks, [Ctrl]/[Command]-click several tracks.
- To select a continuous range of tracks, [Shift]-click the first and last track in a continuous range of tracks.

Selected tracks are indicated by a light gray color in the track list.

RELATED LINKS

Track Selection follows Event Selection on page 1251
Scroll To selected Track on page 1257
Select Channel/Track on Solo on page 1257
Select Channel/Track on Edit Settings on page 1257

Selecting Tracks with Arrow Keys

You can select tracks and events with the up/down arrow keys on the computer keyboard. However, you can make the up/down arrow keys exclusively available for selecting tracks.

- To make the up/down arrow keys exclusively available for selecting tracks, select **File > Preferences > Editing** and activate **Use Up/Down Navigation Commands for selecting Tracks only**.

The following applies:

- When this option is deactivated and no event/part is selected in the **Project** window, the up/down arrow keys on the computer keyboard are used to step through the tracks in the track list.
- When this option is deactivated and an event/part is selected in the **Project** window, the up/down arrow keys still step through the tracks in the track list – but on the currently selected track, the first event/part will automatically be selected as well.
- When this option is activated, the up/down arrow keys are only used to change the track selection – the current event/part selection in the **Project** window will not be altered.

Duplicating Tracks

You can duplicate a track with all contents and channel settings.

PROCEDURE

- Select **Project > Duplicate Tracks**.

RESULT

The duplicated track appears below the original track.

Disabling Audio Tracks

You can disable audio tracks that you do not want to play back or process at the moment. Disabling a track zeroes its output volume and shuts down all disk activity and processing for the track.

PROCEDURE

- Right-click in the track list and select **Disable Track** from the context menu.

RESULT

The track color changes and the corresponding channel in the **MixConsole** is hidden.

To enable a disabled track and restore all channel settings, right-click in the track list and select **Enable Track**.

Organizing Tracks in Folder Tracks

You can organize your tracks in folders by moving tracks into folder tracks. This allows you to perform editing on several tracks as one entity. Folder tracks can contain any type of track including other folder tracks.

- To create a folder track, open the **Project** menu and in the **Add Track** submenu select **Folder**.
- To create new folder track and move all selected tracks into it, open the **Project** menu and from the **Track folding** submenu select **Move Selected Tracks To New Folde**r.
- To move tracks into a folder, select them and drag them into the folder track.
- To remove tracks from a folder, select them and drag them out of the folder.
- To hide/show tracks in a folder, click the **Expand/Collapse Folder** button of the folder track.

- To hide/show data on a folder track, open the context menu for the folder track and select an option from the **Show Data on Folder Tracks** submenu.
- To mute/solo all tracks in a folder track, click the **Mute** or **Solo** button for the folder track.

NOTE

Hidden tracks are played back as usual.

Moving Tracks to Folder Tracks

You can move your tracks to folder tracks to organize them and to perform editing on several tracks as one entity. You can move any type of track including other folder tracks to folder tracks.

PROCEDURE

- Select **Project > Track Folding > Move Selected Tracks to New Folder**.

RESULT

This creates a new folder and moves all selected tracks into it.

NOTE

You can also drag and drop tracks into or out of a folder track.

RELATED LINKS

Folder Tracks on page 119
Folder Track Controls on page 120

Handling Overlapping Audio

The basic rule for audio tracks is that each track can only play back a single audio event at a time. If two or more events overlap, you will only hear one of them: the one that is actually visible (e.g. the last lap of a cycle recording).

If you have a track with overlapping (stacked) events/regions, use one of the following methods to select the event/region that is played back:

- Open the context menu for the audio event in the event display and select the desired event or region from the **To Front** or **Set to Region** submenu.

  The available options depend on whether you performed a linear or a cycle recording and the record mode you used. When recording audio in cycle mode, the recorded event is divided in regions, one for each take.

- Use the handle in the middle of a stacked event and select an entry from the pop-up menu that appears.

- Activate **Show Lanes** and click the desired take.

RELATED LINKS

Working with Lanes on page 153

Track Folding

You can show, hide, or invert tracks that are displayed in the **Project** window event display. This allows you to divide the project into several parts by creating several folder tracks for the different project elements and showing/hiding their contents by selecting a menu function or using a key command. You can also fold in automation tracks this way.

- To open the **Track Folding** menu, select **Project > Track Folding**.

The following options are available:

Toggle Selected Track

Reverses the fold state of the selected track.

Fold Tracks

Folds in all open folder tracks in the **Project** window.

NOTE

The behavior of this function depends on the **Deep Track Folding** setting in the **Preferences** dialog.

Unfold Tracks

Unfolds all folder tracks in the **Project** window.

NOTE

The behavior of this function depends on the **Deep Track Folding** setting in the **Preferences** dialog.

Flip Fold States

Flips the fold states of the tracks in the **Project** window. This means that all tracks that were folded in will be unfolded and all unfolded tracks will be folded in, respectively.

Move Selected Tracks to New Folder

Moves all selected tracks to the folder track. This menu option is available, if at least one folder track is available.

NOTE

You can assign key commands for these menu options in the **Key Commands** dialog in the **Project** category.

The following option also affects the track folding behavior:

Deep Track Folding

To activate this option, select **File > Preferences > Editing > Project & MixConsole**.

If this option is activated, any folding settings that you make on the **Track Folding** submenu of the **Project** menu also affect the subelements of the tracks. For example, if you fold in a folder track that contains 10 audio tracks, of which 5 have several open automation tracks, all these audio tracks within the folder track will also be folded in.

How Events are Displayed on Folder Tracks

Closed folder tracks can display data of the contained audio, MIDI, and instrument tracks as data blocks or as events.

When you close folder tracks, the contents of the contained tracks are displayed as data blocks or events. Depending on the folder track height, the display of the events can be more or less detailed.

Modifying Event Display on Folder Tracks

You can modify the event display on folder tracks.

PROCEDURE

1. Right-click the folder track.
2. On the context menu, select **Show Data on Folder Tracks**.

   You have the following options:

   - **Always Show Data**

     If this option is activated, data blocks or event details are always displayed.
   - **Never Show Data**

     If this option is activated, nothing is displayed.
   - **Hide Data When Expanded**

     If this option is activated, the display of events is hidden when you open folder tracks.
   - **Show Event Details**

     If this option is activated, event details are displayed. If deactivated, data blocks are displayed.

   NOTE

   To change these settings, select **File > Preferences > Event Display > Folders**.

RELATED LINKS

Event Display - Folders on page 1261

Working with Lanes

The descriptions in the following paragraphs focus on cycle recordings with takes. However, you can also apply lane operations and comping methods on overlapping events or parts that you assemble on one track.

If you perform a cycle recording in the **Keep History** or **Cycle History + Replace** modes (audio) or in the **Stacked** or **Mix-Stacked** modes (MIDI), the recorded cycle laps are shown on the track with the last recorded take active and on top.

The **Show Lanes** mode gives you a good overview of all your takes. If you activate the **Show Lanes** button, the recorded takes are shown on separate lanes.

Show Lanes button

Lanes are handled differently, depending on whether you work with audio or MIDI:

Audio

As each audio track can only play back one single audio event at a time, you only hear the take that is activated for playback, for example, the last lap of a cycle recording.

MIDI

Overlapping MIDI takes (parts) can be played back simultaneously. If you recorded in **Mix-Stacked** mode, you hear all takes from all cycle laps.

Lanes can be reordered, sized, and zoomed like regular tracks.

To solo a lane, you can activate the **Solo** button for it. This allows you to hear the lane in the project context. If you want to hear the take without the project context, you also have to activate the main track's **Solo** button.

Assembling a Perfect Take

You can play back, cut, and activate takes to combine the best parts of your recording in a final take.

PROCEDURE

1. Select the **Comp** tool or the **Object Selection** tool.
2. Bring a take to front to select it for playback, and listen to it.
3. Audition different takes to compare them in more detail.
4. If necessary, cut your takes into smaller sections, create new ranges, and bring them to front.
5. Proceed until you are satisfied with the result.

AFTER COMPLETING THIS TASK

After assembling your perfect take, you can improve your take.

- To automatically resolve overlaps and remove empty lanes, right-click the track and select **Clean Up Lanes**.

For audio, proceed as follows:

- Apply auto fades and crossfades to the comped takes.
- To put all takes on a single lane, and remove all takes in the background, select all takes and select **Audio > Advanced > Delete Overlaps**.
- To create a new and continuous event of all selected takes, select **Audio > Bounce Selection**.

For MIDI, proceed as follows:

- Open your takes in a MIDI editor to perform fine adjustments like removing or editing notes.
- To create a new and continuous part of all selected takes that is placed on a single lane, select all takes and select **MIDI > Bounce MIDI**.
- To create a new part and place it on a new track, select **MIDI > Merge MIDI in Loop**.

Finally, clean up the lanes as follows:

- Right-click a track and select **Create Tracks from Lanes**.

  The lane is converted into a new track.

Assembling Operations

Unless it is clearly stated, all operations can be performed in the **Project** window and in the **Audio Part Editor**. Snap is taken into account, and all operations can be undone.

To assemble a perfect take, you can use the **Comp** tool, the **Object Selection** tool, or the **Range Selection** tool.

- The **Comp** tool modifies all takes on all lanes simultaneously.

  This is useful if the recorded takes have the same start and end positions.

- The **Object Selection** tool and the **Range Selection** tool affect single takes on individual lanes.

  If this is not what you want, you can either perform your edits on the main track or use the **Comp** tool.

NOTE

If you assemble stacked events on an audio track, select **File > Preferences > Editing > Audio**, and deactivate **Treat Muted Audio Events like Deleted**.

The following operations can be performed:

Operation	Comp tool	Object Selection/Range Selection tool
Select	Hold down [Shift] and click on a take.	Click on a take.
Bring to front (**Project** window only)	Click on a take. Click twice to toggle.	Position the mouse pointer over the middle of the lower border of a take until it changes to a Comp symbol, and click. Click twice to toggle. For MIDI this mutes/unmutes a take.
Comp (create a new range and bring it to front, **Project** window only)	Click and drag on a lane. All takes are cut at the range start and end. If the audio takes are adjacent without gaps or fades and the material itself matches, the takes are merged within the range.	-
Audition	Press [Ctrl]/[Command] to activate the **Speaker** tool and click at the position where you want playback to start.	See left.
Move	Click and drag on the main track.	Click and drag on any lane.

Operation	Comp tool	Object Selection/Range Selection tool
Resize	Drag the resize handles. All takes with the same start and end positions are affected. Resizing is constrained to the end or start of the adjacent takes. This ensures that you do not create overlaps accidentally.	Drag the resize handles.
Correct timing (Slip Event)	Select a take, hold down [Alt]/[Option]-[Shift] (the tool modifier for Slip Event) and drag with the mouse.	See left.
Cut	[Alt]/[Option]-click on a take. If you cut a MIDI part and the cut position intersects one or several MIDI notes, the result depends on the **Split MIDI Events** option (**File > Preferences > Editing > MIDI**).	See left.
Adjust cuts	Position the mouse pointer over a cut and drag to the left or to the right.	See left.
Glueing cuts	Bring a new range to front.	Select a range spanning all the cuts that you want to glue, and double-click.

RELATED LINKS

Splitting Events on page 203

Defining the Track Time Base

The time base of a track determines if the events on a track are positioned to bars and beats (musical time base) or to the timeline (linear time base). Changing the playback tempo affects only the time position of events on tracks with a musical time base.

PROCEDURE

- In the track list, click **Toggle Timebase** to change the time base.

RESULT

Musical time base is indicated by a note symbol, linear time base is indicated by a clock symbol.

Musical track time base

Time linear track time base

NOTE

Switching between linear and musical time base results in a very small loss of positioning precision. Therefore you should avoid switching repeatedly between the two modes.

RELATED LINKS

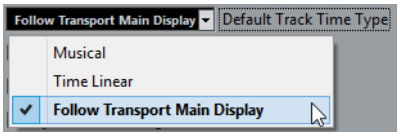
Editing tempo and signature on page 976

Defining the Default Track Time Base

You can specify the default track time type for new tracks (audio, group/FX, MIDI, and marker tracks).

PROCEDURE

- Select **File > Preferences > Editing** and from the **Default Track Time Type** pop-up menu, select a default track time type.



RESULT

If you selected **Follow Transport Main Display**, the primary time format setting on the Transport panel is used. When this is set to **Bars+Beats**, tracks with musical time base are added. When this is set to any of the other options (Seconds, Timecode, Samples, etc.), all new tracks use linear time base.

RELATED LINKS

Default Track Time Type on page 1250

TrackVersions

TrackVersions allow you to create and manage multiple versions of events and parts on the same track.

TrackVersions are available for audio, MIDI, and instrument tracks. You can also have TrackVersions of the chord track (NEK only), the signature track, and the tempo track.

TrackVersions are useful for the following tasks:

- Starting new recordings from scratch.
- Comparing different takes and comps.
- Managing takes that were recorded in a multi-track recording.

NOTE

TrackVersions are not available for automation tracks.

TrackVersions are included in track archives and project backups. When you work with the networking feature, only the active TrackVersion is committed.

The TrackVersion key commands can be found in the **TrackVersions** category of the **Key Commands** dialog.

TrackVersions Pop-Up Menu

The **TrackVersions** pop-up menu is available for all track types that support TrackVersions. It contains the most important functions for managing TrackVersions and a TrackVersions list.

To open the **TrackVersions** pop-up menu for a track, click the arrow to the right of the track name.

The following options are available:

TrackVersion List

Lists all TrackVersions of the track for which you opened the **TrackVersions** pop-up menu and allows you to activate a TrackVersion.

New Version

Creates a new, empty TrackVersion for the selected tracks.

Duplicate Version

Creates a copy of the active TrackVersion for the selected tracks.

Rename Version

Opens a dialog that allows you to change the TrackVersion name for the selected tracks.

Delete Version

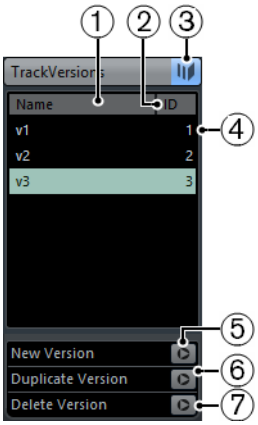
Deletes the active TrackVersion for the selected tracks.

Select Tracks with Same Version ID

Selects all tracks that have a TrackVersion with the same ID.

TrackVersions Inspector Section

The **TrackVersions Inspector** section allows you to view and manage TrackVersions for a selected track. It is available for audio tracks, MIDI tracks, instrument tracks, and the chord track (NEK only).



To open the **TrackVersions Inspector** section for a track, select the track, and in the **Inspector**, click the **TrackVersions** tab.

1) **Name column**

   Shows the version name. Double-click to change it. The name will be changed for all selected tracks.

2) **ID column**

   Shows the TrackVersion ID.

3) **Track Version Indicator**

   Indicates that more than one TrackVersion exists.

4) **Track Version list**

   Lists all TrackVersions and allows you to activate one of them for all selected tracks.

5) **New Version**

   Creates a new, empty TrackVersion for all selected tracks.

6) **Duplicate Version**

   Creates a copy of the active TrackVersion for all selected tracks.

7) **Delete Version**

   Deletes the active TrackVersion for all selected tracks. This function is only available if the track has more than one TrackVersion.

Creating New TrackVersions

You can create new, empty TrackVersions for selected tracks.

PROCEDURE

1. In the track list, select the tracks for which you want to create a new TrackVersion.
2. Select **Project > TrackVersions > New Version**.

   NOTE

   You can also use the **TrackVersions Inspector** (only available for audio tracks, MIDI tracks, instrument tracks, and the chord track (NEK only)) or the **TrackVersions** pop-up menu in the track list to create a new TrackVersion.

RESULT

The event display shows a new, empty TrackVersion. Events of previous TrackVersions are hidden. The track list shows a default version name.

TrackVersion IDs

All TrackVersions are automatically assigned an ID. TrackVersions that are created together get the same TrackVersion ID and can be selected together.

In the **TrackVersions Inspector**, the TrackVersion ID is shown in the **ID** column of the TrackVersion list.

In the track list, you can open the **TrackVersions** pop-up menu to see the TrackVersion ID.

Selecting Tracks by TrackVersion ID

You can simultaneously select all tracks that share the same TrackVersion ID.

PROCEDURE

1. Activate the TrackVersion.
2. Select **Project > TrackVersions > Select Tracks with same Version ID**.

RESULT

All tracks that have TrackVersions with the same ID are selected.

Assigning a Common ID

TrackVersions on different tracks that were not created together have different TrackVersion IDs. TrackVersions with different IDs cannot be activated together. To do this, you must assign a new version ID to these tracks.

PROCEDURE

1. Select the tracks and activate the TrackVersions to which you want to assign a common version ID.
2. Select **Project > TrackVersions > Assign Common Version ID**.

RESULT

A new ID is assigned to all active TrackVersions on the selected tracks. The tracks are now marked as belonging together. You can now activate them together.

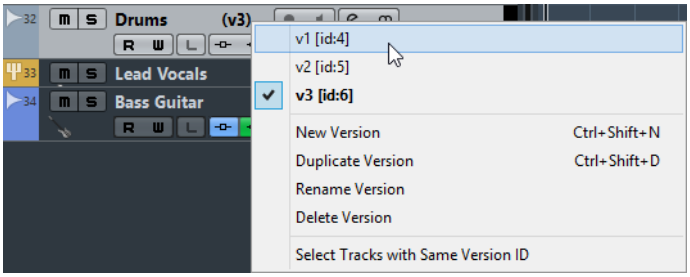
Active TrackVersion

If you created more than one TrackVersion for a track, you can show the events of a specific TrackVersion in the event display. This process is referred to as activating TrackVersions.

Activating TrackVersions

PROCEDURE

1. Click the arrow to the right of the track name to open the **TrackVersions** pop-up menu.



2. Select the TrackVersion that you want to activate.

RESULT

The selected version is activated and its events are shown in the event display.

NOTE

If you work with audio tracks, MIDI tracks, instrument tracks, or the chord track (NEK only), you can also use the **TrackVersions Inspector** to activate a TrackVersion.

Activating TrackVersions on Multiple Tracks

You can simultaneously activate TrackVersions on multiple tracks if these TrackVersions share the same ID.

PROCEDURE

1. Select all tracks for which you want to activate a specific TrackVersion.
2. Click the arrow to the right of the track name to open the **TrackVersions** pop-up menu.
3. Select the TrackVersion that you want to activate from the list.

RESULT

The selected TrackVersion is activated for all selected tracks, and the corresponding events are shown in the event display.

NOTE

If you work with audio tracks, MIDI tracks, instrument tracks, or the chord track (NEK only), you can also use the **TrackVersions Inspector** to activate a TrackVersion.

Duplicating TrackVersions

You can duplicate a TrackVersion by creating a new TrackVersion that contains a copy of the active TrackVersion.

PROCEDURE

1. In the track list, select the tracks and activate the TrackVersion that you want to duplicate.
2. Select **Project > TrackVersions > Duplicate Version**.

   In the event display, a duplicate TrackVersion is displayed. In the track list, a default version name for the duplicate is shown.

   NOTE

   You can also use the **TrackVersions Inspector** for audio tracks, MIDI tracks, instrument tracks, and chord tracks (NEK only) or the **TrackVersions** pop-up menu in the track list to duplicate a TrackVersion.

Deleting TrackVersions

You can delete the active TrackVersions for the selected tracks.

PROCEDURE

1. Select the tracks and activate the TrackVersions that you want to delete.
2. Select **Project > TrackVersions > Delete Version**.

   NOTE

   You can also use the **TrackVersions Inspector** for audio tracks, MIDI tracks, instrument tracks, and chord tracks (NEK only) or the **TrackVersions** pop-up menu in the track list to delete the active TrackVersion for selected tracks.

Copying and Pasting Selection Ranges Between TrackVersions

You can copy and paste ranges between different TrackVersions, even across multiple tracks.

PREREQUISITE

You have at least 2 TrackVersions.

PROCEDURE

1. Select the **Range Selection** tool.
2. Select a range of the TrackVersion that you want to copy.
3. Select **Edit > Copy**.
4. Activate the TrackVersion into which you want to insert the copied range.
5. Select **Edit > Paste**.

RESULT

The copied range from the first TrackVersion is pasted to the second TrackVersion at the exact same position.

NOTE

If you want to perform more complicated comping tasks, we recommend to select **Project > TrackVersions > Create Lanes from Versions** and proceed with the **Comp** tool.

Copying and Pasting Selected Events between TrackVersions

You can copy and paste selected events between different TrackVersions, even across multiple tracks.

PREREQUISITE

You have at least 2 TrackVersions, and you have split the corresponding events with the **Cut** tool, for example.

PROCEDURE

1. Select the **Object Selection** tool.
2. Select the events that you want to copy.
3. Select **Edit > Copy**.
4. Activate the TrackVersion into which you want to insert the copied events.
5. Select **Edit > Functions > Paste at Origin**.
   This ensures that the events are inserted at the exact same position.

RESULT

The copied events from the first TrackVersion are pasted to the second TrackVersion at the exact same position.

TrackVersion Names

Each TrackVersion has a default TrackVersion name.

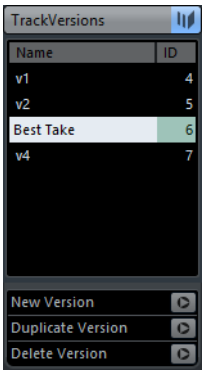
If more than one version is available for the track, the TrackVersion name is shown in the track list and in the **TrackVersions Inspector** section. By default, TrackVersions are named v1, v2, etc. However, you can rename each TrackVersion to your liking.

Renaming a TrackVersion

PROCEDURE

- In the **TrackVersions Inspector** section, double-click the TrackVersion name and enter a new name.

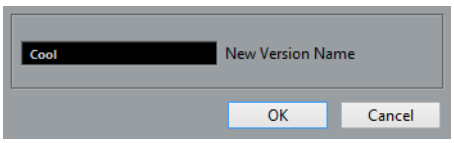
  The name is changed. If the available space in the track list is too small, the name is abbreviated automatically.



Renaming TrackVersions on Multiple Tracks

PROCEDURE

1. Activate all TrackVersions that you want to rename, and select the corresponding tracks.
2. Select **Project > TrackVersions > Rename Version**.
3. Enter a new TrackVersion name and click **OK**.



RESULT

In the track list, the new TrackVersion name is shown.

NOTE

If you want to assign the same ID to TrackVersions, select **Project > TrackVersions > Assign Common Version ID**.

TrackVersions vs. Lanes

TrackVersions and lanes are individual features that complement each other. Every TrackVersion can have its own set of lanes.

Creating Lanes from TrackVersions

If your project contains TrackVersions and you want to continue working with lanes, using the **Comp** tool, for example, you can create lanes from TrackVersions.

PROCEDURE

1. Select the tracks for which you want to create lanes.
2. Select **Project > TrackVersions > Create Lanes from Versions**.

   A new TrackVersion named **Lanes from Version** is added. This TrackVersion contains all TrackVersions on separate lanes. The original TrackVersions are kept. Lanes that you create from MIDI TrackVersions are muted.
3. In the track list or in the **Inspector**, activate the **Show Lanes** button for the track.
4. On the **Project** window toolbar, activate the **Comp** tool and continue as usual.

Creating TrackVersions from Lanes

If your project contains lanes and you want to continue working with the TrackVersion functions, you can create TrackVersions from lanes.

PROCEDURE

1. Select the tracks for which you want to create TrackVersions.

   If you only want to convert specific lanes, select these lanes.
2. Select **Project > TrackVersions > Create Versions from Lanes**.

RESULT

New TrackVersions are added, one for each separate lane. The original lanes are kept. Any crossfades that you have created between different lanes are discarded.

Track Presets

Track presets are templates that can be applied to newly created or existing tracks of the same type.

You can create them from virtually all track types (audio, MIDI, instrument, group, FX, VST instument return, input, and output channels). They contain sound and channel settings, and allow you to quickly browse, preview, select, and change sounds, or reuse channel settings across projects.

Track presets are organized in the MediaBay. There, you can categorize them with attributes.

Audio Track Presets

Track presets for audio tracks, group tracks, FX tracks, VST instrument channels, input channels, and output channels include all settings that define the sound.

You can use the factory presets as a starting point for your own editing and save the audio settings that you optimized for an artist that you often work with as a preset for future recordings.

The following data is saved in audio track presets:

- Insert effects settings (including VST effect presets)
- EQ settings
- Volume and pan
- Input gain and phase

NOTE

To access the track presets functions for input and output channels, activate the **Write** buttons for input and output channels in the MixConsole. This creates input and output channel tracks in the track list.

Instrument Track Presets

Instrument track presets offer both MIDI and audio features and are the best choice when handling sounds of simple, mono-timbral VST instruments.

Use instrument track presets for auditioning your tracks or saving your preferred sound settings, for example. You can also extract sounds from instrument track presets for use in instrument tracks.

The following data is saved in instrument track presets:

- Audio insert effects
- Audio EQ
- Audio volume and pan

- Audio input gain and phase
- MIDI insert effects
- MIDI track parameters
- Input Transformer settings
- The VST instrument used for the track
- Staff settings
- Color settings
- Drum map settings (NEK only)

MIDI Track Presets

You can use MIDI track presets for multi-timbral VST instruments. You can also use them for external instruments.

When creating MIDI track presets you can either include the currently set channel or the currently set patch.

- To ensure that saved MIDI track presets for external instruments will work again with the same instrument, install the instrument as a MIDI device, see the separate PDF document MIDI Devices.

The following data is saved in MIDI track presets:

- MIDI modifiers (Transpose, etc.)
- MIDI insert effects
- Output and Channel or Program Change
- Input Transformer settings
- Volume and pan
- Staff settings
- Color settings
- Drum map settings (NEK only)

Multi-Track Presets

You can use multi-track presets, for example, when recording setups that require several microphones (a drum set or a choir, where you always record under the same conditions) and you have to edit the resulting tracks in a similar way. Furthermore, they can be used when working with layered tracks, where you use several tracks to generate a certain sound instead of manipulating only one track.

If you select more than one track when creating a track preset, the settings of all selected tracks are saved as one multi-track preset. Multi-track presets can only be applied if the target tracks are of the same type, number, and sequence as the tracks in the track preset, therefore, they should be used in recurring situations with similar tracks and settings.

VST Presets

VST instrument presets behave like instrument track presets. You can extract sounds from VST presets for use in instrument tracks.

The following data is saved in VST instrument presets:

- VST instrument
- VST instrument settings

NOTE

Modifiers, inserts, and EQ settings are not saved.

VST effect plug-ins are available in VST 3 and VST 2 format.

NOTE

In this manual, VST presets stands for VST 3 instrument presets, unless stated otherwise.

Pattern Banks (NEK only)

Pattern banks are presets that are created for the Beat Designer MIDI effect.

They behave much like track presets.

RELATED LINKS

Previewing Pattern Banks (NEK only) on page 616
Track Presets on page 167

Applying Track Presets

When you apply a track preset, all the settings that are saved in the preset are applied.

Track presets can be applied to tracks of their own type only. The only exception are instrument tracks: for these, VST presets are also available.

NOTE

- Once a track preset is applied, you cannot undo the changes. It is not possible to remove an applied preset from a track and return to the previous state. If you are not satisfied with the track settings, you have to either edit the settings manually or apply another preset.
- Applying VST presets to instrument tracks leads to removal of modifiers, MIDI inserts, inserts, or EQs. These settings are not stored in VST presets.

Loading Track or VST Presets

PROCEDURE

1. In the **Project** window, select a track.
2. Do one of the following:
   - In the **Inspector**, click **Load Track Preset**.
   - In the track list, right-click the track and select **Load Track Preset**.
3. In the **Presets** browser, select a track or VST preset.
4. Double-click the preset to load it.

RESULT

The preset is applied.

NOTE

You can also drag and drop track presets from the MediaBay, the Windows Explorer, or the Mac OS Finder onto a track of the same type.

RELATED LINKS

Filters Section on page 618

Loading Multi-Track Presets

PROCEDURE

1. In the **Project** window, select several tracks.

   NOTE

   Multi-track presets can only be applied if track type, number, and sequence are identical for the selected tracks and the track preset.

2. In the track list, right-click the track and select **Load Track Preset**.

3. In the **Presets** browser, select a multi-track preset.
4. Double-click the preset to load it.

RESULT

The preset is applied.

Loading Inserts and EQ from Track Presets

Instead of loading complete track presets, you can also apply insert or equalizer settings from track presets.

PROCEDURE

1. Select a track, open the **Inspector** or the **Channel Settings** window, and click the **VST Sound** button on the **Inserts** or **Equalizers** tab/section.
2. Select **From Track Preset**.
3. In the **Presets** browser, select a track preset.
4. Double-click the preset to load the settings.

Extracting the Sound from an Instrument Track or VST Preset

For instrument tracks, you can extract the sound of an instrument track preset or VST preset.

PROCEDURE

1. Select the instrument track to which you want to apply a sound.
2. In the **Inspector**, click **VST Sound**.
3. In the **Presets** browser, select an instrument track preset or VST preset.
4. Double-click the preset to load the settings.

RESULT

The VST instrument and its settings (but no inserts, EQs, or modifiers) on the existing track are overwritten with the data of the track preset. The previous VST instrument for this instrument track is removed and the new VST instrument with its settings is set up for the instrument track.

Creating a Track Preset

You can create a track preset from a single track or from a combination of tracks.

PROCEDURE

1. In the **Project** window, select one or more tracks.
2. In the track list, right-click one of the selected tracks and select **Save Track Preset**.
3. In the **New Preset** section, enter a name for the new preset.

   NOTE

   You can also define attributes for the preset.

4. Click **OK** to save the preset and exit the dialog.

RESULT

Track presets are saved within the application folder in the Track Presets folder. They are saved in default subfolders named according to their track type: audio, MIDI, instrument, and multi.

RELATED LINKS

Attribute Inspector on page 622

Track Quick Control Presets

For audio, instrument, MIDI, FX, and group tracks, you can save and load your own Quick Control assignments as presets or use the factory presets.

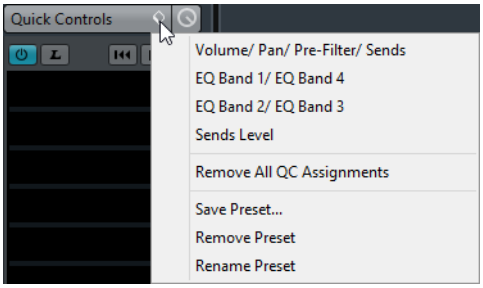
Saving/Loading Track Quick Control Assignments as Presets

PROCEDURE

1. In the **Inspector** for your track, open the **Quick Controls** section.

   For instrument tracks, the track quick controls are set to the 8 default VST quick controls of the loaded instrument by default.

2. Click **Preset Management** in the top right corner of the **Inspector** section and select one of the presets.



The Track Quick Control assignment changes and gives you access to the channel parameters.

NOTE

You can also make your own assignments and save them as presets and delete, rename, or reset the presets to the default assignments.

Parts and Events

Parts and events are the basic building blocks in Nuendo.

The tracks in the Project window contain parts and/or events. Different event types are handled differently in the Project window:

- Video events and automation events (curve points) are always viewed and rearranged directly in the Project window.
- MIDI events can always be found in MIDI parts, which are containers for one or more MIDI events. MIDI parts are rearranged and manipulated in the Project window. To edit the individual MIDI events in a part, you have to open the part in a MIDI editor.
- Audio events can be displayed and edited directly in the Project window, but you can also work with audio parts containing several events. This is useful if you have a number of events which you want to treat as one unit in the project. Audio parts also contain information about the time position in the project.

NOTE

If the “Object Selection tool: Show Extra Info” option is activated in the Preferences dialog (Editing–Tools page), a tooltip will be shown for the Object Selection tool, displaying information depending on where you point it. For example, in the Project window event display, the tool will show the current pointer position and the name of the track and event you are pointing at.

The Preferences dialog contains several settings for customizing the display in the Project window.

RELATED LINKS

Event Display on page 1260
Event Display - MIDI on page 1262
Event Display - Chords on page 1263
Event Display - Tracks on page 1262

Audio Handling

When you work with audio files, it is crucial to understand how audio is handled in Nuendo.

When you edit or process audio in the Project window, you always work with an audio clip that is automatically created on import or during recording. This audio clip refers to an audio file on the hard disk that itself remains untouched. This means, that audio editing and processing is “non-destructive”, in the sense that you can always undo changes or revert to the original versions.

Audio Clips

An audio clip does not necessarily refer to just one original audio file!

If you apply some processing to a specific section of an audio clip, for example, this will create a new audio file containing only this section. The processing will then be applied to the new audio file only, leaving the original audio file unchanged. Finally, the audio clip is automatically adjusted, so that it refers both to the original file and to the new, processed file. During playback, the program will switch between the original file and the processed file at the correct positions. You will hear this as a single recording, with processing applied to one section only. This feature makes it possible to undo processing at a later stage, and to apply different processing to different audio clips that refer to the same original file.

Audio Events

An audio event is the object that you place on a time position in Nuendo.

If you make copies of an audio event and move them to different positions in the project, they will still all refer to the same audio clip. Furthermore, each audio event has an Offset value and a Length value. These determine at which positions in the clip the event will start and end, i.e. which section of the audio clip will be played back by the audio event. For example, if you resize the audio event, you will just change its start and/or end position in the audio clip – the clip itself will not be affected.

Audio Regions

An audio region is a section within a clip with a length value, a start time, and a snap point.

Audio regions are shown in the Pool and are best created and edited in the Sample Editor.

NOTE

If you want to use one audio file in different contexts, or if you want to create several loops from one audio file, convert the corresponding regions of the audio clip to events and bounce them into separate audio files. This is necessary since different events that refer to the same clip access the same clip information.

Parts

Parts are containers for MIDI or audio events, and for tracks.

RELATED LINKS

Folder Parts on page 179

Creating MIDI Parts

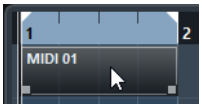
A MIDI part is automatically created when you record. It contains the recorded events. However, you can also create empty MIDI parts and later add events to them.

You can create MIDI parts in the following ways:

- Draw a part on a MIDI track with the Draw tool.

  You can also draw parts by pressing [Alt]/[Option] and using the Object Selection tool.

- Double-click with the Object Selection tool on a MIDI track, between the left and right locator.



Adding Events to a MIDI Part

- To add events to a MIDI part, use the tools and functions in a MIDI editor.

RELATED LINKS

MIDI Editors on page 777

Creating Audio Parts

There is no way of automatically creating audio parts on recording. On recording audio events are created always.

You can create audio parts in the following ways:

- To gather existing audio events into a part, select **Audio > Events to Part**.

  This creates an audio part containing all selected audio events on the same track.

  To remove the part and make the events appear as independent objects on the track again, select the part and select **Audio > Dissolve Part**.

- Draw a part on an audio track with the Draw tool.

  You can also draw parts by pressing [Alt]/[Option] and using the Object Selection tool.

- Double-click with the Object Selection tool on an audio track, between the left and right locator.

NOTE

You can use copy and paste or drag and drop in the Audio Part Editor to add events to existing audio parts.

RELATED LINKS

Audio Part Editor on page 565

Auditioning Audio Parts and Events

Audio parts and events can be auditioned in the Project window with the Play tool.

PROCEDURE

1. Select the Play tool.
2. Click where you want playback to start, and keep the mouse button pressed.

   Only the track on which you click is played back, starting at the click position.

   NOTE

   When auditioning, audio will be routed directly to the Control Room, if the Control Room is activated. When the Control Room is deactivated, the audio will be routed to the default output bus, bypassing the audio channel's settings, effects and EQs.

3. Release the mouse button to stop playback.

Adding Events to a Track

To add events to a track, do one of the following:

- Record.
- Drag and drop files on the track.

  You can drag from the following locations: the desktop, the **MediaBay** and its related windows, the **Pool**, a library (a pool file that is not attached to a project), the **Find media** dialog, another open **Project** window, the **Audio Part Editor**, the **Sample Editor** (press [Ctrl]/[Command] and drag to create an event of the current selection, or click in the left column of the region list and drag to create an event from a region).
- Grab audio CD tracks and convert them to audio files.
- Use **Copy** and **Paste** on the **Edit** menu.

  This allows you to copy all kinds of events between projects. You can also copy events within the project, for example, from the **Sample Editor**.
- Draw marker or automation tracks.

  For audio, MIDI, and instrument tracks, you can only draw parts.
- Import audio or video files via the **File > Import** menu.

  When you import a file this way, a clip is created for the file and an event that plays the whole clip is inserted on the selected track, at the position of the project cursor.
- Import audio or video files via the **File > Import** menu.
- Import only the audio portion of a video file and convert it to an audio file via the **File > Import** menu.

RELATED LINKS

Basic Recording Methods on page 239
MediaBay on page 598
Exporting and importing standard MIDI files on page 1202
Importing audio CD tracks on page 1188
About Thumbnails on page 1105
Creating MIDI Parts on page 176
Creating Audio Parts on page 177

Scrubbing

Scrubbing can be quite a burden on your system. If playback problems occur, try deactivating the “Use High Quality Scrub Mode” option in the Preferences dialog (Transport–Scrub page). The resampling quality will then be lower, but scrubbing will be less demanding on the processor. This can be useful when scrubbing in large projects.

You can adjust the volume of the Scrub function in the Preferences dialog (Transport–Scrub page).

When scrubbing with the mouse, insert effects are always bypassed.

Using the Scrub Tool

The Scrub tool allows you to locate positions in MIDI or audio parts and in audio events by playing back, forwards or backwards, at any speed.

PROCEDURE

1. Select the Play tool and click a second time on the icon.

   A pop-up menu opens.

2. Select “Scrub”.
3. Click your event or part and keep the mouse button pressed.

   The project cursor moves to the position where you click. The mouse pointer is not visible anymore.

4. Drag to the left or right.

   The project cursor moves correspondingly and the event or part is played back. The speed and thus the pitch of the playback depend on how fast you move the mouse.

   NOTE

   You can also scrub all audio and video tracks of your project with the Jog wheel and Shuttle Speed control on the Transport panel. In this case, MIDI events are ignored.

Folder Parts

A folder part is a graphic representation of events and parts on the tracks in the folder. Folder parts indicate the position and length of the events and parts, as well as on which track they are (their vertical position). If part colors are used, these are also shown in the folder part.

Editing Folder Parts

Any editing that you perform in the **Project** window to a folder part affects all the events and parts it contains.

You can select several folder parts and edit them at the same time. The editing you can perform includes:

- Moving a folder part.

  This moves its contained events and parts, possibly resulting in other folder parts, depending on how the parts overlap.

- Using cut, copy, and paste.
- Deleting a folder part. This will delete its contained events and parts.
- Splitting a folder part with the **Cut** tool.
- Gluing folder parts together with the **Glue** tool. This will only work if the adjacent folder parts contain events or parts on the same track.
- Resizing a folder part resizes the contained events and parts according to the selected resizing method.
- Muting a folder part. This will mute its contained events and parts.

Tracks inside a folder can be edited as one entity by performing the editing directly on the folder part containing the tracks. You can also edit individual tracks within the folder by showing the contained tracks, selecting parts and opening editors as usual.

- To open the editor for the track classes that are present in a folder part, double-click the folder part.

  All MIDI parts that are located on the tracks within the folder are displayed as if they were on the same track, just like when opening the **Key Editor** with several MIDI parts selected.

  To be able to discern the different tracks in the editor, give each track a different color in the Project window and use the **Part Colors** option in the editor.

  If the folder contains tracks with audio events and/or audio parts, the Sample and/or Audio Part Editors are opened with each audio event and audio part in a separate window.

RELATED LINKS

Coloring Notes and Events on page 781

Render in Place

Render in Place is a function that lets you render existing material to new audio material. Nuendo allows you to export audio material to `wav.` files.

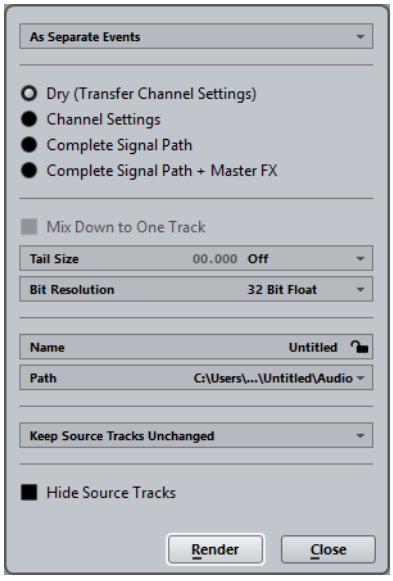
You can render the following:

- Audio tracks
- Instrument tracks
- Audio events or parts on audio tracks
- MIDI parts on instrument tracks
- Range selections on audio or instrument tracks
- Range selections on multiple audio or instrument tracks

Render Tracks Dialog

The **Render Tracks** dialog allows you to customize the track render settings.

To open the **Render Tracks** dialog, select one or more audio tracks, instrument tracks, or MIDI tracks, and select **Edit > Render in Place > Render Settings**.



The following settings are available:

As Separate Events

One or more tracks are created. These contain separate events or parts that are saved as separate audio files.

As Block Events

One or more tracks are created. These contain adjacent events/parts that are combined to blocks. Every block is saved as a separate audio file.

As One Event

One or more tracks are created. These contain the events/parts that are combined to one event/part. Every combination is saved as a separate audio file.

Dry (Transfer Channel Settings)

If this option is activated, all effects and panner settings are copied to new audio tracks.

Channel Settings

If this option is activated, all effects are rendered into the resulting audio files. This includes insert effects, channel strip settings, group channel settings, or FX send channel settings. Panner settings are transferred to the new audio tracks.

Complete Signal Path

If this option is activated, the complete signal path is rendered into the new audio files, including all channel settings, group channel settings, FX send channel settings and panner settings. The new audio track is created without effects. Stereo balance panner settings are activated.

Complete Signal Path + Master FX

If this option is activated, the complete signal path and the master bus settings are rendered into the resulting audio files. This includes all channel settings, group channel settings, FX send channel settings, and panner settings.

NOTE

- For the render options **Dry (Transfer Channel Settings)** and **Channel Settings**, the resulting audio tracks keep the formats of their source tracks. A mono track results in a mono track.
- For the render options **Complete Signal Path** and **Complete Signal Path + Master FX**, the resulting audio file format is determined by the output channel of the source track. A mono track that is routed to a stereo bus results in stereo audio files.

Mix Down to One Track

By default, rendering multiple tracks or selections from multiple tracks at once results in multiple new audio tracks. To create one resulting audio track from all your source material, activate the **Mix Down to One Track** option.

The **Mix Down to One Track** option is not available if the following applies:

- If the render option **Dry (Transfer Channel Settings)** is selected.
- Only 1 track with 1 output channel is selected.
- The channels that you want to mix down are routed to different targets.
- One of the channels has a send.

- One track with multiple outputs and either **Dry (Transfer Channel Settings)**, **Complete Signal Path**, or **Complete Signal Path + Master FX** are selected.

Tail Size

Allows you to set a tail size in seconds or bars and beats for the rendered files. This adds time at the end of the rendered file to allow reverb and delay tails to fully fade out.

Bit Resolution

Allows you to set the bit resolution for the resulting material to16bit, 24bit, or 32bit float.

Name

Allows you to enter a custom name for the rendered files. To do this, unlock this option by clicking the lock icon.

Path

Allows you to select a custom folder to which the resulting `.wav` files are rendered.

From the pop-up menu, select what is to happen with the source tracks after rendering. The following options are available:

Keep Source Tracks Unchanged

If this option is selected, the source tracks remain unchanged.

Mute Source Tracks

If this option is selected, the source tracks are automatically muted.

Disable Source tracks

If this option is selected, the source tracks are disabled and are therefore no longer processed. This option releases CPU and RAM resources and is therefore similar to the **Freeze** function. To re-enable the tracks, right-click the disabled track to open the context menu and select **Enable Track**.

Remove Source Tracks

If this option is selected, the source tracks are removed from the track list.

Hide Source Tracks

If this option is activated, the source tracks are hidden after rendering. To show the source tracks again, select the **Visibility** tab in the **Project** window and select the track that you want to show.

RELATED LINKS

Setting Pan on page 379

Rendering Tracks

You can render selected tracks either via the **Render Tracks** dialog or by directly using the Render (with Current Settings) command.

PROCEDURE

1. Select one or more audio, MIDI, or instrument tracks.
2. Select **Edit > Render in Place > Render Settings**.
3. Specify the render options.
4. Click **Render**.

RESULT

All selected source material is processed according to your render settings. Your render options are saved and used for all further render operations.

NOTE

You can also start the rendering operation directly by selecting **Edit > Render in Place > Render (with Current Settings)**.

Render Selection Dialog

To open the **Render Selection** dialog, select one or more audio events and/or MIDI parts and select **Edit > Render in Place > Render Settings**.

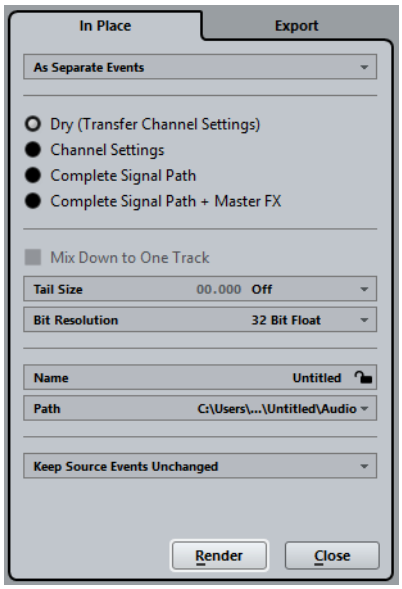
You can render selections of audio events and/or MIDI parts with default settings or with customized settings. The **Render Selection** dialog allows you to customize the render settings. On the **In Place** tab, you can render source material into the project. The **Export** tab allows you to export rendered audio files as `.wav` files out of Nuendo.

In Place

You can customize the render settings on the **In Place** tab of the **Render Selection** dialog.

To open the **Render Selection** dialog, make a selection of one or more audio events and/or MIDI parts and select **Edit > Render in Place > Render Settings**.

The following settings are available:



Dry (Transfer Channel Settings)

If this option is activated, all effects and panner settings are copied to new audio tracks.

Channel Settings

If this option is activated, all effects are rendered into the resulting audio files. This includes insert effects, channel strip settings, group channel settings, or FX send channel settings. Panner settings are transferred to the new audio tracks.

Complete Signal Path

If this option is activated, the complete signal path is rendered into the new audio files, including all channel settings, group channel settings, FX send channel settings and panner settings. The new audio track is created without effects. Stereo balance panner settings are activated.

Complete Signal Path + Master FX

If this option is activated, the complete signal path and the master bus settings are rendered into the resulting audio files. This includes all channel settings, group channel settings, FX send channel settings, and panner settings.

Mix Down to One Track

By default, rendering multiple tracks or selections from multiple tracks at once results in multiple new audio tracks. To create one resulting audio track from all your source material, activate the **Mix Down to One Track** option.

The **Mix Down to One Track** option is not available if the following applies:

- If the render option **Dry (Transfer Channel Settings)** is selected.
- Only 1 track with 1 output channel is selected.
- The channels that you want to mix down are routed to different targets.

- One of the channels has a send.
- One track with multiple outputs and either **Dry (Transfer Channel Settings)**, **Complete Signal Path**, or **Complete Signal Path + Master FX** are selected.

Tail Size

Allows you to set a tail size in seconds or bars and beats for the rendered files. This adds time at the end of the rendered file to allow reverb and delay tails to fully fade out.

Bit Resolution

Allows you to set the bit resolution for the resulting material to16bit, 24bit, or 32bit float.

Name

Allows you to enter a custom name for the rendered files. To do this, unlock this option by clicking the lock icon.

Path

Allows you to select a custom folder to which the resulting `.wav` files are rendered.

From the pop-up menu, decide what is to happen with the source tracks after rendering. The following options are available:

Keep Source Events Unchanged

If this option is selected, the source events remain unchanged.

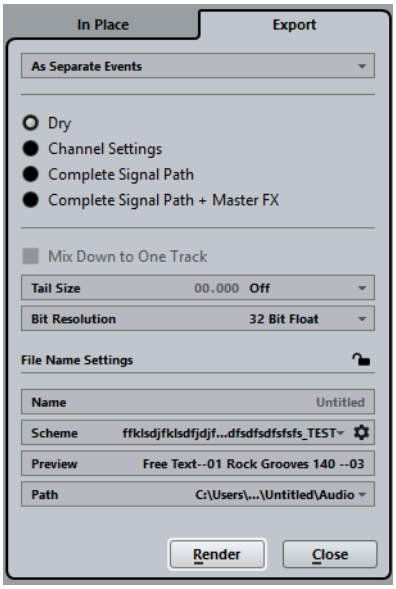
Mute Source Events

If this option is selected, the source events are automatically muted.

Export

On the **Export**, tab you can configure the export of rendered material in `.wav`. You can use the default folder, or set a custom folder for export. The **Export** tab also allows you to add and use file naming schemes.

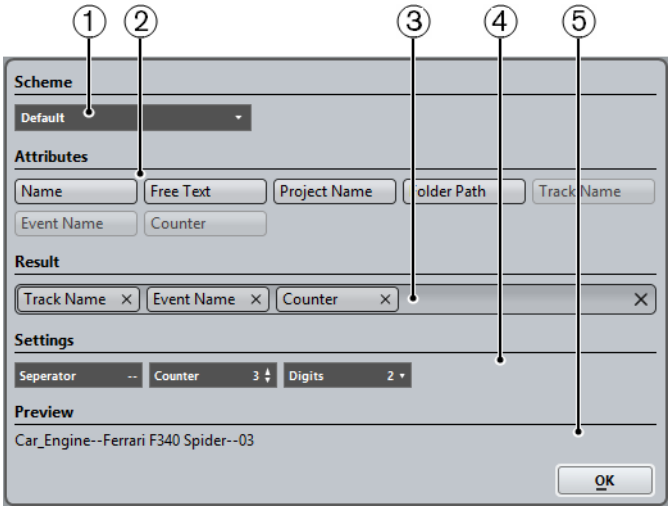
To open the **Export** tab, make a selection of one or more audio events and/or MIDI parts, and select **Edit > Render in Place > Render Settings > Export**.



The same rendering settings apply as on the **In Place** tab. For export render operations, you can additionally define file naming schemes by using attributes.

You can define naming schemes in the **Naming Scheme** window. To open the **Naming Scheme** window, click the **Open Naming Scheme** button ⚙. Once you have defined a naming scheme, you can type in the `Name` field. The text is added to the position of the **Name** attribute.

Naming Scheme Window



1) **Scheme**

The **Scheme** pop-up menu allows you to save and delete naming schemes.

2) **Attributes**

Holds naming scheme attributes that build the naming scheme.

3) **Result**
Drop attributes to this field and rearrange them by dragging.

4) **Settings**
Select separator and counter settings.

5) **Preview**
Displays a preview of your current settings.

Defining Naming Schemes

You can define naming schemes by putting in order attributes which build the structure of the file name of the exported audio files.

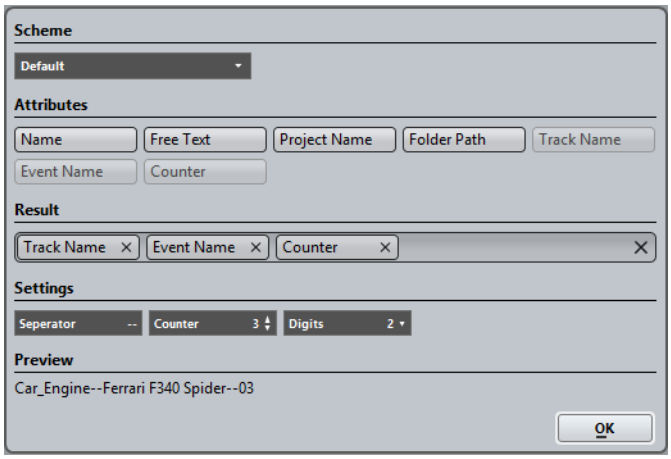
NOTE

If the **Mix Down to One Track** option is activated in the **Render Selection** dialog, the naming scheme feature is not available.

NOTE

Each attribute is available only once, except the free text attribute. You can place a maximum of seven attributes.

To open the **Naming Scheme** window, unlock the **File Name Settings** section by clicking on the lock icon and click the **Open Naming Scheme Window** button on the **Render Selection** dialog.



To add or remove naming scheme attributes to or from the drop zone, do one of the following:

- Double-click the attribute you want to add to the drop zone.
- Drag the attribute to the drop zone. You can also change the order of the attributes by dragging.
- To remove an attribute, click its **x** icon.
- To remove an attribute, drag the attribute out of the drop zone.

- To remove all attributes, click the **x** icon on the right of the drop zone.

The following attributes are available:

Name

This attribute adds the text you entered on the **Render Selection** dialog in the **Name** field to the resulting file name.

NOTE

The resulting file name only contains the text in the **Name** field of the **File Name Settings** in the **Render Selection** dialog, if no naming scheme defined. The file name corresponds to the naming scheme, if the naming scheme contains attributes.

Project Name

This attribute adds the project name to the resulting file name.

Folder Path

This attribute adds the folder path of the events from the track list to the resulting file name.

Track Name

This attribute adds the track name of the audio event or MIDI part to the resulting file name.

Event Name

This attribute adds the event name of the audio event or MIDI part to the resulting file name.

Counter

This attribute adds a number to the resulting file name.

Counter Settings

Separator

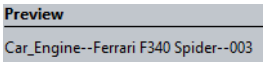
Divides attributes from each other.

Counter

This is the value from which the counter starts counting.

Digits

This is the number of number of digits prior to the counter value.



Digits value set to 2.

Free Text

Adds free text to the file name.

Saving Naming Schemes

You can save several naming schemes in the **Naming Scheme** window. Saved naming schemes are displayed on the **Scheme** pop-up menu. Every change that is made to the currently active naming scheme is saved immediately.

PROCEDURE

1. Define a naming scheme by adding attributes to the drop zone.
2. Make separator and counter settings.
3. To rename the naming scheme, double-click on **Default**, type in the new name, and press [Enter].

Rendering Selections

You can render selections of audio events and/or MIDI parts via the **Render Selection** dialog.

PROCEDURE

1. Select one or more audio events and/or MIDI parts or make a range selection.
2. Select **Edit > Render in Place > Render Settings**.
   The **Render Selection** dialog opens.
3. Specify the render options.
4. Click **Render**.

RESULT

All selected source material is processed according to your render settings. Your render options are saved and used for all further render operations.

NOTE

You can also start rendering operation directly by selecting **Edit > Render in Place > Render (with Current Settings)**.

Game Audio Connect

Game Audio Connect makes it easy to transfer game audio assets to game audio engines or middlewares, such as Audiokinetic Wwise. As a sound designer, you create and edit game audio assets in Nuendo and directly transfer them to your game audio engine.

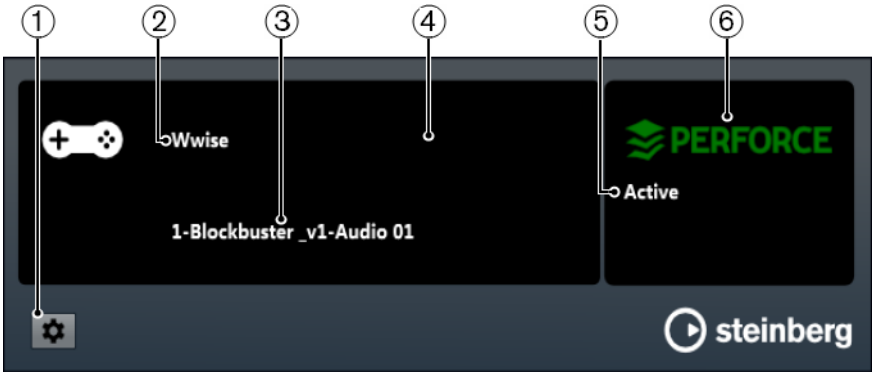
An audio engine that is enabled for Game Audio Connect is able to quickly locate your audio parts, either on a local hard disc, in a network, or in a version control system. From your game audio engine you can select an audio asset and make Nuendo open the project that contains it.

Game Audio Connect Window

The **Game Audio Connect** window is the interface between the game audio engine and Nuendo. It displays the connected game audio engine and the selected audio asset. The **Game Audio Connect** window is a drop zone for direct drag and drop, render, and export operations.

NAVIGATION PATH

Project > Game Audio Connect



1) **Settings**
Allows you to open **Game Audio Connect Settings** dialog.

2) **Game Audio Engine**
Displays the connected game audio engine that is currently connected.

3) **Audio Asset**
Displays the audio asset that is selected in the game audio engine.

4) **Drop Zone**
Allows you to trigger the quick render and export process by placing edited audio assets on the drop zone using drag and drop.

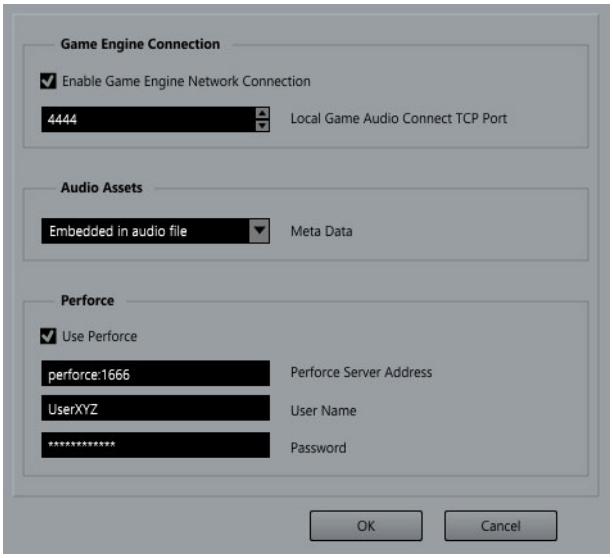
5) **Connection Status**
Displays the connection status of the version control system.

6) **Version Control System**
Displays the connected version control system.

Game Audio Connect Settings Dialog

The **Game Audio Connect Settings** dialog allows you to make settings for the game audio engine and perforce to connect to Nuendo, which is the host in a network connection.

To open the **Game Audio Connect Settings** dialog select **Project > Game Audio Connect** and click the **Settings** button.



The following settings are available:

Enable Game Engine Network Connection

Allows your game audio engine to connect to Nuendo.

Local Game Audio Connect TCP Port

Sets the Port for the game audio engine to connect to.

Meta Data

Sets the type of meta data storage. Meta data is used to locate audio assets in Nuendo projects. By default, meta data is embedded in the rendered audio file.

Set this parameter to one of the following:

- **Embedded in Audio File**
- **In Separate File**

When the meta data is stored in a separate file, this file has the extension `.amd`.

Use Perforce

Activates the Perforce feature.

Perforce Server Address

Allows you to set the Perforce server address.

User Name

Allows you to enter your Perforce user name.

Password

Allows you to enter your Perforce password.

Exporting Audio Assets to a Game Audio Engine

Game Audio Connect directly notifies your game audio engine if Nuendo has rendered and exported audio assets. For render and export operations to your game audio engine, you can either use the **Render in Place** function, the **Export Audio Mixdown** function, or you can directly drag and drop audio material to the drop zone, in the **Game Audio Connect** window.

RELATED LINKS

Export Audio Mixdown on page 1018
Render in Place on page 181
Exporting Audio Assets Using Drag And Drop on page 193

Exporting Audio Assets Using Drag And Drop

Using drag and drop is the quickest way to directly render and directly export audio material from Nuendo to your game audio engine. Nuendo takes the current render settings into account.

PROCEDURE

1. Select a target sound effect in your game audio engine.

   The file name of the selected audio effect is displayed in the **Game Audio Connect** window.

2. Drag the corresponding audio events from the Nuendo **Project** window to the drop zone of the **Game Audio Connect** window.

RESULT

The render operation is triggered for the dragged events. The rendered audio files are automatically transferred to the connected game audio engine.

NOTE

You can also use the drag and drop feature if Nuendo and your game audio engine are connected via a network.

RELATED LINKS

Render Selection Dialog on page 184
Setting up Game Audio Connect for Network Communication on page 194

Setting up Game Audio Connect for Network Communication

If Nuendo and your game audio engine run on different computers, you can use the **Game Engine Connection** settings to establish a network connection. In such a network connection, Nuendo serves as host.

PROCEDURE

1. In your game audio engine, set the Nuendo network address to the IP address of the computer that is running Nuendo.
2. In Nuendo, open the **Game Audio Connect Settings** dialog.
3. In the **Game Engine Connection** section, activate the **Enable Game Engine Network Connection** option.
4. Specify the **Local Game Audio Connect TCP Port**.

   The default **Local Game Audio Connect TCP Port** may be in use by another software on your system. If the port is in use, you have to specify another port to establish a network connection.

RESULT

Nuendo and your game audio engine are connected. The **Game Audio Connect** window displays the connected game audio engine.

RELATED LINKS

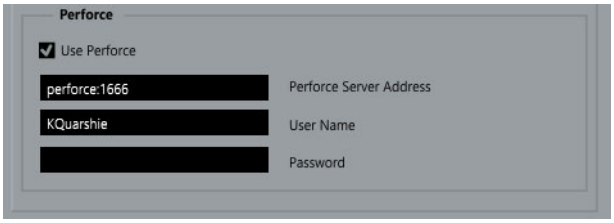
Game Audio Connect Settings Dialog on page 192

Perforce Integration

Game Audio Connect provides a Perforce integration that allows version control for Nuendo projects.

Perforce Settings

The Perforce settings in the **Game Audio Connect Settings** dialog allow you to enable Perforce.



The following settings are available:

Use Perforce

Activates Perforce.

Server

Allows you to set the Perforce server address.

User

Allows you to enter your Perforce user name.

Password

Allows you to enter your Perforce password.

Editing Parts and Events

This section describes techniques for editing in the **Project** window. If not explicitly stated, all descriptions apply to both events and parts, even though we use the term "event" for convenience.

When you are using the tools for editing, you can in many cases get additional functions by pressing modifier keys (e.g. pressing [Alt]/[Option] and dragging with the **Object Selection** tool creates a copy of the dragged event).

NOTE

You can customize the default modifier keys in the **Preferences** dialog.

RELATED LINKS

Editing - Tool Modifiers on page 1258

Selecting Events

You can select events using any of the following methods:

- Use the **Object Selection** tool.
- Use the **Select** submenu on the **Edit** menu.
- Right-click on a track and select **Select All Events** from the context menu.
- To select ranges, regardless of the event and track boundaries, use the **Range Selection** tool.
- Use the arrow keys on the computer keyboard.
- If the **Auto Select Events under Cursor** option (**File > Preferences > Editing**) is activated, all events on the selected tracks that are touched by the project cursor are automatically selected.

  This is helpful when rearranging your project, because it allows you to select whole sections on all tracks by selecting all tracks and moving the project cursor.

RELATED LINKS

Selecting with the Object Selection Tool on page 196
Select Submenu on page 196
Range Editing on page 213

Selecting with the Object Selection Tool

PROCEDURE

1. On the **Project** window toolbar, click **Object Selection**.
2. In the event display, click the events or parts that you want to select.
   The standard techniques apply.

Select Submenu

- To open the **Select** submenu, select **Edit > Select**.

The following options are available, when the **Object Selection** tool is selected:

All

Selects all events in the **Project** window.

None

Deselects all events.

Invert

Inverts the selection – all selected events are deselected and all events that were not selected are selected instead.

In Loop

Selects all events that are partly or wholly between the left and right locator.

From Start to Cursor

Selects all events that begin to the left of the project cursor.

From Cursor to End

Selects all events that end to the right of the project cursor.

Equal Pitch

These are available in the MIDI editors and the **Sample Editor**.

Select Controllers in Note Range

This is available in the MIDI editors.

All on Selected Tracks

Selects all events on the selected track.

Events under Cursor

Automatically selects all events on the selected track(s) that are touched by the project cursor.

Select Event

This is available in the **Sample Editor**.

Left/Right Selection Side to Cursor

These two functions are only used for range selection editing.

NOTE

When **Range Selection** tool is selected, the **Select** submenu features other functions.

RELATED LINKS

Selection Range Options on page 213

Removing Events

To remove an event from the **Project** window, do one of the following:

- Click on the event with the **Erase** tool.
- To delete all following events, but not the event that you clicked and all events before it, press [Alt]/[Option] and click on an event.
- Select the events and press [Backspace], or select **Edit > Delete**.

Moving Events

You can move events using any of the following methods:

- Use the **Object Selection** tool.
- Use the **Move to** submenu on the **Edit** menu.
- Select the event and edit the start position in the info line.
- Use the **Nudge** buttons on the toolbar.

RELATED LINKS

Moving with the Object Selection Tool on page 198
“Move to” Submenu on page 198
Moving via the Info Line on page 199
Moving with the Nudge Buttons on page 199

Moving with the Object Selection Tool

PROCEDURE

1. In the **Project** window toolbar, click **Object Selection**.
2. In the event display, click the events or parts you want to move, and drag to a new position.

   NOTE

   You can only drag events to tracks of the same type.

3. Optional: Hold down [Ctrl]/[Command] while dragging to restrict movement either horizontally or vertically.

RESULT

All selected events are moved, maintaining their relative positions. If Snap is activated, this determines to which positions you can move the events.

NOTE

To avoid accidentally moving events when you click on them in the **Project** window the response when you move an event by dragging is slightly delayed. You can adjust this delay with the **Drag Delay** setting (**File > Preferences > Editing**).

“Move to” Submenu

- To open the **Move to** submenu, select **Edit > Move to**.

The following options are available:

Cursor

Moves the selected event to the project cursor position. If there are several selected events on the same track, the first event will start at the cursor, and the following will be lined up end-to-start after the first one.

Origin

Moves the selected events to their original positions, i.e. the positions at which they were originally recorded.

Front/Back

This function does not actually change the position of the events, but moves the selected events to the front or back, respectively. This is useful if you have overlapping events and want to see one that is partially obscured. For audio events, this is an extra important feature, because only the visible sections of events will be played back. Moving an obscured audio event to front (or moving the obscuring event to back) will allow you to hear the whole event on playback.

Moving via the Info Line

PROCEDURE

1. In the event display, select the event or part that you want to move.
2. In the info line, double-click the **Start** field and enter a new value for the event start.

   The event is moved accordingly.

Moving with the Nudge Buttons

PROCEDURE

1. Right-click the **Project** window toolbar and activate **Nudge Palette**.

   The nudge buttons become available in the toolbar.
2. In the event display, select the events or parts that you want to move, and use the **Move Left**/**Move Right** nudge buttons.

   The selected events or parts are moved to the left or right.

Aligning Audio Events or Parts to other Audio Events or Parts

PROCEDURE

1. Select an event or part of any type on any track.

   This will be taken as a reference for aligning.
2. Point on the audio event or part you want to move, press one of the modifiers and click.

   The mouse pointer will change its shape and the audio event or part will be aligned to the selected part or event.

   NOTE

   When the snap point is set, it will be used as a reference when you align events.

RELATED LINKS

Modifiers for Aligning to Parts, Events, and Selection Ranges on page 204

Aligning Audio Events or Parts to Selection Ranges

PROCEDURE

1. Make a selection range on any track.

   This will be taken as a reference for aligning.

2. Point on an audio event or part, press one of the modifiers and click.

   The mouse pointer will change its shape and the audio event or part will be aligned to the selection range.

   NOTE

   When the snap point is set, it will be used as a reference when you align events.

RELATED LINKS

Modifiers for Aligning to Parts, Events, and Selection Ranges on page 204

Aligning Audio Events or Parts to the Cursor

PROCEDURE

1. Set the cursor to the position where you want to move the audio part or event.

   This will be taken as a reference for aligning.

2. Deselect everything in your project.

3. With the Object Selection tool, point on an audio event or part, press one of the modifiers and click.

   The mouse pointer will change its shape and the audio event or part will be aligned to the cursor.

   NOTE

   When the snap point is set, it will be used as a reference when you align events.

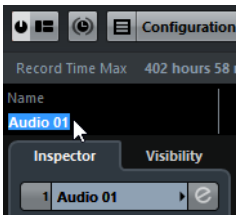
RELATED LINKS

Modifiers for Aligning to Parts, Events, and Selection Ranges on page 204

Renaming Events

By default, audio events show the name of their clip, but you can enter a separate descriptive name for events.

- To rename an event, select the event and type in a new name in the **Name** field on the info line or select **Edit > Rename Objects**.



- To give all events on a track the same name as the track, change the track name, hold down a modifier key, and press [Return].

- To rename multiple events at the same time, select the events, select **Edit > Rename Objects**, and select one of the renaming options.

You have several options for renaming events automatically using sequential numbers, timestamps and more.

RELATED LINKS

Renaming Clips or Regions in the Pool on page 577

Resizing Events

Resizing events means to move their start or end positions individually.

The following resizing modes are available:

Normal Sizing

The contents of the event stay fixed, and the start or end point of the event is moved to “reveal” more or less of the contents.

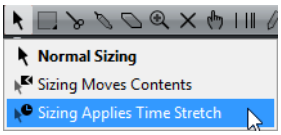
Sizing Moves Contents

The contents follow the moved start or end of the event (see the figure below).

Sizing Applies Time Stretch

The contents will be time stretched to fit the new event length.

- To select one of the resizing modes, select the **Object Selection** tool and then click again on the **Object Selection** tool icon on the toolbar. This opens a pop-up menu from which you can select one of the options.



The toolbar icon indicates the resizing mode

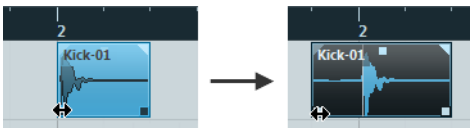
IMPORTANT

When resizing events, any automation data not taken into account.

To resize events, do one of the following:

- Click and drag the lower left or right corner of the event.

  If **Snap** is activated, the **Snap** value determines the resulting length. If several events are selected, all will be resized in the same way.

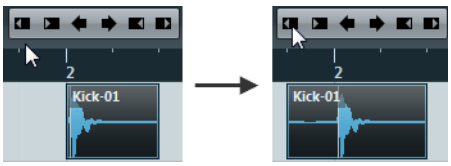


Normal sizing

Sizing moves contents

- Use the **Trim** buttons (**Nudge** palette) on the toolbar.

  This will move the start or end position of the selected events by the amount set on the **Grid Type** pop-up menu. The sizing type currently selected applies to this method too, with the exception of **Sizing Applies Time Stretch** which is not possible with this method.



- Use the **Scrub** tool.
- Apply time stretch.

RELATED LINKS

Snap Function on page 62
Resizing Events Using Time Stretch on page 202

Resizing Events Using Time Stretch

Time stretching allows you to resize a part and make its contents fit the new size.

PROCEDURE

1. Click the **Object Selection** tool on the toolbar and click again to select the **Sizing Applies Time Stretch** option from the pop-up menu.
2. Point close to the end point of the part you want to stretch.
3. Click and drag left or right.

   When you move the mouse, a tooltip shows the current mouse position and length of the part. Snap is taken into account.
4. Release the mouse button.

RESULT

The part is stretched or compressed to fit the new length.

- For MIDI parts, this means that the note events are stretched (moved and resized).

  Controller data and Note Expression (NEK only) data will be stretched, too.

- For audio parts, this means that the events are moved, and that the referenced audio files are time stretched to fit the new length.

  A dialog shows the progress of the time stretch operation.

RELATED LINKS

Time Stretch on page 485

Splitting Events

You can split events in the **Project** window in the following ways:

- Click with the **Cut** tool on the event you want to split.

  If Snap is activated, this determines the exact split position. You can also split events by pressing [Alt]/[Option] and clicking with the **Object Selection** tool.

- Select **Edit > Functions > Split at Cursor**.

  This splits the selected events at the position of the project cursor. If no events are selected, all events (on all tracks) that are intersected by the project cursor will be split.

- Select **Edit > Functions > Split Loop**.

  This splits events on all tracks at the left and right locator positions.

NOTE

If you split a MIDI part so that the split position intersects one or several MIDI notes, the result depends on the **Split MIDI Events** option (**File > Preferences > Editing > MIDI**). If the option is activated, the intersected notes will be split (creating new notes at the beginning of the second part). If it is deactivated, the notes will remain in the first part, but stick out after the end of the part.

RELATED LINKS

Snap Function on page 62

Gluing Events Together

No data will be kept in the clipboard.

The following options are available:

- To glue an event together with the next event on the track, click on an event with the Glue tool. The events do not have to touch one another.

  The result is a part containing the two events, with one exception: If you first split an event and then glue the two sections together again (without moving or editing them first), they become a single event again.

- You can select several events on the same track and click on one of them with the Glue tool.

  A single part is created.

- To glue an event together with all following events on this track, hold down [Alt]/[Option] and click on an event with the Glue tool.

Modifiers for Aligning to Parts, Events, and Selection Ranges

For aligning audio events or parts to events, parts or ranges, the following modifiers are available:

Use [Ctrl]/[Command] to align the start of the audio event/part to the start of the selected event, part or range.

This function is available when you move the mouse on the beginning of the non-selected event.

Use [Ctrl]/[Command]-[Alt]/[Option] to copy the audio event/part and align its start to the start of the selected event, part or range.

This function is available when you move the mouse on the beginning of the non-selected event.

Use [Ctrl]/[Command] to align the end of the audio event/part to the start of the selected event, part or range.

This function is available when you move the mouse on the end of the non-selected event.

Use [Ctrl]/[Command]-[Alt]/[Option] to copy the audio event/part and align its end to the start of the selected event, part or range.

This function is available when you move the mouse on the end of the non-selected event.

Use [Ctrl]/[Command]-[Shift] to align the start of the audio event/part to the end of the selected event, part or range.

This function is available when you move the mouse on the beginning of the non-selected event.

Use [Ctrl]/[Command]-[Shift]-[Alt]/[Option] to copy the audio event/part and align its start to the end of the selected event, part or range.

This function is available when you move the mouse on the beginning of the non-selected event.

Use [Ctrl]/[Command]-[Shift] to align the end of the audio event/part to the end of the selected event, part or range.

This function is available when you move the mouse on the end of the non-selected event.

Use [Ctrl]/[Command]-[Shift]-[Alt]/[Option] to copy the audio event/part and align its end to the end of the selected event, part or range.

This function is available when you move the mouse on the end of the non-selected event.

For aligning audio events or parts to the cursor, the following modifiers are available:

Use [Ctrl]/[Command] to align the start of the audio event/part to the cursor.

This function is available when you move the mouse on the beginning of the non-selected event.

Use [Ctrl]/[Command]-[Alt]/[Option] to copy the audio event/part and align its start to the cursor.

This function is available when you move the mouse on the beginning of the non-selected event.

Use [Ctrl]/[Command] to align the end of the audio event/part to the cursor.

This function is available when you move the mouse on the end of the non-selected event.

Use [Ctrl]/[Command]-[Alt]/[Option] to copy the audio event/part and align its end to the cursor.

This function is available when you move the mouse on the end of the non-selected event.

NOTE

You can change the modifiers in the **Preferences** dialog (**Editing–Tool Modifiers** page).

Duplicating

Events can be duplicated in the following ways:

- Hold down [Alt]/[Option] and drag the event to a new position.

  If Snap is activated, this determines to which positions you can copy the events.

  NOTE

  If you hold down [Ctrl]/[Command] as well, movement direction is restricted to either horizontal or vertical. That means if you drag an event vertically it cannot be moved horizontally at the same time.

- Select **Edit > Functions > Duplicate** to create a copy of the selected event and place it directly after the original.

  If several events are selected, all of these are copied “as one unit”, maintaining the relative distance between the events.

NOTE

When you duplicate audio events, the copies always refer to the same audio clip.

Cutting, Copying, and Pasting Events

You can cut or copy selected events, and paste them in again, using the functions on the **Edit** menu.

- When you paste an audio event, it is inserted on the selected track, positioned so that its snap point is aligned with the cursor position.

  If the selected track is of the wrong type, the event will be inserted on its original track.

- If you use the **Paste at Origin** function (**Edit > Function**), the event is pasted at the position from which you cut or copied it.
- If you use the **Paste Relative to Cursor** function (**Edit > Function**), the event is pasted while keeping its relative position to the project cursor.

RELATED LINKS

Snap Function on page 62

Using Cut Head and Cut Tail

You can cut everything to the left or right of the cursor or a selected range.

- To delete everything to the left of the cursor/selection range, select **Edit > Range > Cut Head**.

  No data will be kept in the clipboard.

- To delete everything to the right of the cursor/selection range, select **Edit > Range > Cut Tail**.

  No data will be kept in the clipboard.

Repeating

Events can be repeated in the following ways:

- Hold down [Alt]/[Option] and click the handle in the lower right corner of the last selected event and drag to the right.
- Select **Edit > Functions > Repeat** to open a dialog, allowing you to create a number of copies (regular or shared) of the selected events.

Fill Loop

You can create a number of copies between the right and left locators.

- Select **Edit > Functions > Fill Loop** to create a number of copies starting at the left locator and ending at the right locator.

  The last copy is automatically shortened to end at the right locator position.

Creating Shared Copies

You can create shared copies of audio and MIDI parts. If you edit the contents of a shared copy, all other shared copies of the same part are automatically edited in the same way.

- Hold down [Alt]/[Option]-[Shift] and drag to the right.

NOTE

You can convert a shared copy to a real copy by selecting **Edit > Functions > Convert to Real Copy**. This creates a new version of the clip (that can be edited independently) and adds this to the **Pool**.

Sliding the Contents of an Event or Part

You can move the contents of an event or part without changing its position in the Project window.

- To slide an event or part, press [Alt]/[Option]-[Shift], click in the event or part and drag to the left or right.

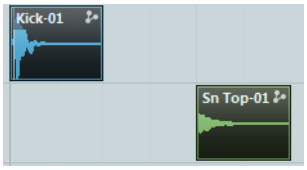
IMPORTANT

When sliding the contents of an audio event, you cannot slide past the start or end of the actual audio clip. If the event plays the whole clip, you cannot slide the audio at all.

Grouping Events

You can treat several events as one unit by grouping them.

- To group events, select the events (on the same or different tracks) and select **Edit > Group**.



Grouped events are indicated by a group icon on the right.

If you edit one of the grouped events in the Project window, all other events in the same group are affected too (if applicable).

Group editing operations include:

- Selecting events.
- Moving and duplicating events.
- Resizing events.
- Adjusting fade-in and fade-out (audio events only).
- Splitting events. Splitting one event will automatically split any other grouped events that are intersected by the split position.
- Locking events.
- Muting events.
- Deleting events.

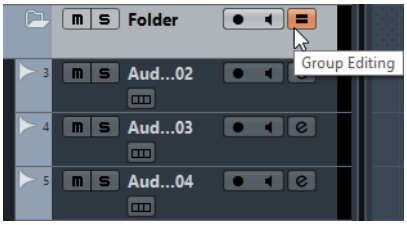
RELATED LINKS

Creating fades on page 274

Group Editing

The group editing mode for folders allows you to quickly group events and parts across multiple tracks without having to select all the events or parts. This is useful for multi-track recordings of drum sets, where you often want to edit the different drum tracks (bass drum, snare, toms, etc.) together. Edit groups are also useful if you want to quantize multiple tracks.

- To activate group editing, click the **Group Editing** button for a folder in the track list.



If the group editing mode is activated and you select an event, a part or a range on a track inside the folder track, other events, parts or ranges that have the same start and end time and the same playback priority, are also selected and temporarily grouped.

Temporarily means that on every new selection with the Object Selection or the Range Selection tool, Nuendo looks for corresponding events or parts inside the folder and groups them. If you edit the start or end point of a single event or part before activating the **=** button for group editing, the event or part is excluded from the group.

Edit actions in group editing mode affect all grouped events, parts, or ranges. If you select another take by using the small **To Front** arrow at the right side of one event of an edit group, for example, all other tracks inside the edit group also switch to the corresponding take. This is useful for comparing takes of a multi-track recording.

NOTE

The group editing setting overwrites any regular group settings in the edit group.

RELATED LINKS

Muting Events on page 210

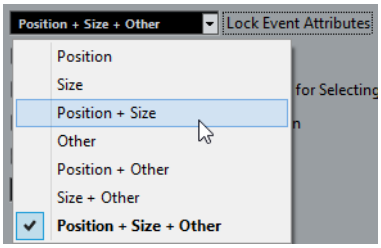
Locking Events

If you want to make sure that you do not edit or move an event by accident, you can lock it.

Locking can affect one or any combination of the following properties:

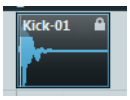
Lock Option	Description
Position	If this is locked, the event cannot be moved.
Size	If this is locked, the event cannot be resized.
Other	If this is locked, all other editing of the event is disabled. This includes adjusting the fades and event volume, processing, etc.

- To specify which of these properties are affected by the **Lock** function, use the **Lock Event Attributes** pop-up menu (**File > Preferences > Editing**).



- To lock events, select them and select **Edit > Lock**.

  The events will be locked according to the options specified in the **Preferences** dialog.



The padlock symbol indicates that one or more of the lock options are activated for the event.

- To adjust the lock options for a locked event, select the locked event and select **Edit > Lock**.

  This opens a dialog in which you can activate or deactivate the desired lock options.

- To unlock an event (turn off all lock options), select the event and select **Edit > Unlock**.

- To lock a whole track, click the padlock symbol in the track list or in the Inspector.

  This disables all editing of all events on the track.

Muting Events

You can mute events in the **Project** window. Muted events can be edited as usual (with the exception of adjusting fades), but are not played back.

Muted events are grayed out.

- To mute events, select them and select **Edit > Mute**.

- To unmute events, select them and select **Edit > Unmute**.

- To mute or unmute a single event, click on it with the **Mute** tool.

- To mute or unmute several events, click in an empty area with the **Mute** tool and drag a selection rectangle around several events.

  All selected events are muted.

- To change the mute status of selected events, [Shift]-click them.

Creating New Files From Events

An audio event plays a section of an audio clip, which in turn refers to one or more audio files on the hard disk. However, you can create a new file that consists only of the section that is played by the event.

PROCEDURE

1. Select one or several audio events.
2. Set up fade in, fade out, and event volume.

   These settings will be applied to the new file.
3. Select **Audio > Bounce Selection**.

   You are asked whether you want to replace the selected event or not.
4. Do one of the following:
   - To create a new file that only contains the audio in the original event, click **Replace**.

     A clip for the new file is added to the **Pool**, and the original event is replaced by a new event playing the new clip.
   - To create a new file and add a clip for the new file to the **Pool**, click **No**.

     The original event is not replaced.

NOTE

You can also apply the **Bounce Selection** function to an audio part. In that case, the audio from all events in the part will be combined into a single audio file. If you select **Replace** when asked, the part will be replaced with a single audio event playing a clip of the new file.

RELATED LINKS

Creating fades on page 274

Region Operations

Regions are sections within a clip.

Regions are best created and edited in the **Sample Editor**. However, to access the following options, select **Audio > Advanced**.

Event or Range as Region

This function is available when one or several audio events or selection ranges are selected. It creates a region in the corresponding clip, with the start and end position of the region determined by the start and end position of the event or selection range within the clip.

Events from Regions

This function is available if you have selected an audio event whose clip contains regions within the boundaries of the event. The function will remove the original event and replace it with events positioned and sized according to the regions.

RELATED LINKS

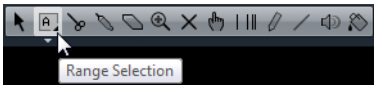
Working with regions on page 522

Range Editing

Editing in the **Project** window is not restricted to handling whole events and parts. You can also work with selection ranges, which are independent from the event/part and track boundaries.

Creating a Selection Range

- To make a selection range, drag with the **Range Selection** tool.

  When the Range Selection tool is selected, you can select selection ranges options via **Edit > Select**.

- To create a selection range that encompasses an event, double-click on an event with the **Range Selection** tool.
- To create a selection range that encompasses several events, hold down [Shift] and double-click several events in a row.
- To open an encompassed event for editing in the **Sample Editor**, double-click it.

RELATED LINKS

Selection Range Options on page 213

Selection Range Options

- To open the range selection options menu, select the **Range Selection** tool and select **Edit > Select**.

All

Makes a selection that covers all tracks, from the start of the project to the end. You can define the track length with the **Length** setting in the **Project Setup** dialog.

None

Removes the current selection range.

Invert

Inverts the selection. All selected events are deselected, and all events that were not selected are selected. Only used for event selection.

In Loop

Makes a selection between the left and right locator on all tracks.

From Start to Cursor

Makes a selection on all tracks, from the start of the project to the project cursor.

From Cursor to End

Makes a selection on all tracks, from the project cursor to the end of the project.

Equal Pitch - all Octaves

This function requires that a single note is selected. It selects all notes of this part that have the same pitch in any octave as the currently selected note.

Equal Pitch - same Octave

This function requires that a single note is selected. It selects all notes of this part that have the same pitch and the same octave as the currently selected note.

Select Controllers in Note Range

Selects the controllers within the note range.

All on Selected Tracks

Selects all events on the selected track. Only used for event selection.

Events under Cursor

Selects all events on the selected tracks that are touched by the project cursor.

Select Event

This is available in the **Sample Editor**.

Left Selection Side to Cursor

Moves the left side of the current selection range to the project cursor position.

Right Selection Side to Cursor

Moves the right side of the current selection range to the project cursor position.

Range to Next Event

Moves the selection range to the next event head or tail on the selected tracks and turns the selection range to a zero selection.

Range to Previous Event

Moves the selection range to the previous event head or tail on the selected tracks and turns selection range to a zero selection.

Enlarge Range to Next Event

Moves the right side of the current selection range to the next event head or tail on the selected tracks.

Enlarge Range to Previous Event

Moves the left side of the current selection range to the previous event head or tail on the selected tracks.

RELATED LINKS

Project Setup Dialog on page 73
Selecting Events on page 195
Select Submenu on page 196

Selecting Ranges for Several Tracks

You can create selection ranges that cover several tracks. It is also possible to exclude tracks from a selection range.

PROCEDURE

1. Create a selection range from the first to the last track.
2. Press [Alt]/[Option] and click in the selection range on the tracks that you want to exclude from the selection.

   If you press [Shift]-[Alt]/[Option] while creating a selection range, the range will encompass all tracks in the track list.

Creating Different Selection Ranges

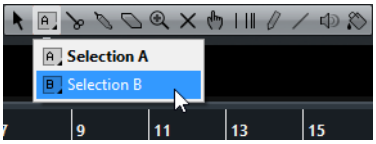
You can create 2 different selection ranges (selection A and selection B) and switch between these. Activating one of the options selects the corresponding selection and causes the event display to switch between the two locations.

PROCEDURE

1. Use the **Range Selection** tool to define a destination range for your selection.

   By default, the first selection you perform will be selection A. The letter currently displayed on the tool icon shows which selection range you are to define.

2. Click on the **Range Selection** tool again and select Selection B from the pop-up menu.



This switches the selection ranges.

3. Define the destination range for selection B.

RESULT

You can now switch between the selection A and selection B ranges with the **Range Selection** pop-up menu.

AFTER COMPLETING THIS TASK

Deactivate the **Range Selection** tool. Otherwise, you might accidentally overwrite your defined selections.

Editing Selection Ranges

Adjusting the Size of Selection Ranges

You can adjust the size of a selection range in the following ways:

- By dragging its edges.

  The pointer takes the shape of a double arrow when you move it over an edge of the selection range.

- By holding down [Shift] and clicking.

  The closest selection range edge will be moved to the position at which you clicked.

- By adjusting the selection range start or end position on the info line.
- By using the trim buttons on the toolbar.

  The left trim buttons move the start of the selection range and the right buttons move the end. The edges are moved by the amount specified on the **Grid** pop-up menu.

NOTE

The trim buttons are located on the **Nudge Palette**, which is not visible on the toolbar by default.

- By using the **Move Left** and **Move Right** buttons on the toolbar.

  These move the whole selection range to the left or the right. The amount of movement depends on the selected display format and the value specified on the **Grid** pop-up menu.

  IMPORTANT

  The contents of the selection are not moved. Using the **Move Left**/**Move Right** buttons is the same as adjusting the start and end of the selection range at the same time by the same amount.

  NOTE

  The move buttons are located on the **Nudge Palette**, which is not visible on the toolbar by default.

- To crop all events or parts that are partially within the selection range, select **Edit > Range > Crop**.

  Events that are fully inside or outside the selection range are not affected.

RELATED LINKS

The setup context menus on page 1226

Moving and Duplicating Selection Ranges

- To move a selection range, click and drag it to a new position.

  This will move the contents of the selection range to the new position. If the range intersected events or parts, these are split before moving, so that only the sections within the selection range are affected.

- To duplicate a selection range, hold down [Alt]/[Option] and drag.

  You can also use the duplicate, repeat, and fill loop functions that are available for duplicating events.

RELATED LINKS

Duplicating on page 206

Cutting, Copying, and Pasting Selection Ranges

You can cut or copy and paste selection ranges, using the functions on the **Edit** menu. You can also use the **Cut Time** and **Paste Time** options.

Cut

Cuts out the data in the selection range and moves it to the clipboard. The selection range is replaced by empty track space in the **Project** window, meaning that events to the right of the range keep their positions.

Copy

Copies the data in the selection range to the clipboard.

Paste

Pastes the clipboard data to the start position and track of the current selection. Existing events on the tracks remain at their original position.

Paste at Origin

Pastes the clipboard data back at its original position. Existing events on the tracks remain at their original position.

This option is available in **Edit > Functions**.

Cut Time

Cuts out the selection range and moves it to the clipboard. Events to the right of the removed range are moved to the left to fill the gap.

This option is available in **Edit > Range**.

Paste Time

Pastes the selection range from the clipboard to the start position and track of the current selection. Existing events are moved to make room for the pasted data.

This option is available in **Edit > Range**.

Paste Time at Origin

Pastes the selection range from the clipboard to its original position. Existing events are moved to make room for the pasted data.

This option is available in **Edit > Range**.

Global Copy

This copies everything in the selection range.

This option is available in **Edit > Range**.

Deleting Data in Selection Ranges

You can delete selection ranges as follows:

- To replace data within the deleted selection range with empty track space, select **Edit > Delete** or press [Backspace].

  Events to the right of the range keep their position.

- To remove the selection range and make the events to the right move to the left to fill the gap, select **Edit > Range > Delete Time**.

Splitting Selection Ranges

- To split any events or parts that are intersected by the selection range, at the positions of the selection range edges, select **Edit > Range > Split**.

Inserting Silence

You can insert empty track space from the start of the selection range. The length of the silence equals the length of the selection range.

- To insert silence, select **Edit > Range > Insert Silence**.

  Events to the right of the selection range start are moved to the right to make room. Events that are intersected by the selection range start are split, and the right section is moved to the right.

Playback and Transport

This chapter describes the methods for controlling playback and transport functions.

RELATED LINKS

Transport on page 1276

Transport Panel

The **Transport** panel contains the main transport functions as well as many other options related to playback and recording.

- To show the transport panel, select **Transport > Transport Panel** or press [F2].

Transport Panel Sections

The **Transport** panel has different sections that you can show or hide by activating the corresponding options on the transport panel context menu.

- To show all **Transport** panel sections, right-click anywhere in the **Transport** panel and select **Show All**.

The following sections are available:

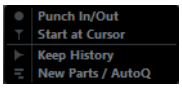
Virtual Keyboard (NEK only)

Allows you to play and record MIDI notes by using your computer keyboard or mouse.

Performance

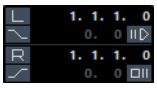
Shows the audio processing load and the hard disk transfer rate.

Record Mode



Determines what happens to your recordings and to any existing events on the track when you are recording. This section also contains the automatic MIDI record quantize function.

Locators



Allows you to go to the left or right locator position, and to activate **Auto Punch In** and **Auto Punch Out**.

Furthermore, you can set the left and right locator position numerically and specify a pre-roll and a post-roll value.

Jog/Scrub

The outer wheel is the **Shuttle Speed** control.

The middle wheel is the **Jog Wheel**.

The **Nudge** buttons **+** and **-** allow you to move the project cursor position to the right or left in steps of 1 frame.

Main Transport

Shows the basic transport controls as well as the time display options.

Arranger

Shows the arranger functions.

Master + Sync

Shows the basic metronome, tempo, and synchronization options.

Marker

Shows the basic marker functions.

MIDI Activity

Allows you to monitor the MIDI input and the MIDI output signals.

Audio Activity

Allows you to monitor the audio input and output signals.

Audio Level Control

Shows clipping indicators and an output level control.

RELATED LINKS

Transport on page 1276
Transport - Scrub on page 1279

Pre-Roll and Post-Roll

You can activate pre-roll and post-roll with the corresponding buttons in the **Locators** section on the **Transport** panel or by selecting **Transport > Use Pre-roll/Use Post-roll**.

- By setting a pre-roll value you instruct Nuendo to roll back a short section whenever playback is activated.

- By setting a post-roll value you instruct Nuendo to play back a short section after automatic punch out before stopping.

NOTE

This is only relevant if **Auto Punch Out** is activated on the **Transport** panel and **Stop after Automatic Punch Out** is activated (**File > Preferences > Transport**).

Using Pre-Roll and Post-Roll

PROCEDURE

1. Set the locators to where you want to start and end recording.
2. On the **Transport** panel, activate **Auto Punch In** and **Auto Punch Out**.
3. Select **File > Preferences > Transport** and activate **Stop after Automatic Punch Out**.

4. On the transport panel, click the **Pre-roll Amount** and the **Post-roll Amount** fields and enter the pre-roll and post-roll values.
5. Activate **Use pre-roll** and **Use post-roll**.
6. Activate **Record**.

RESULT

The project cursor rolls back by the time specified in the **Pre-roll Amount** field and playback starts. When the cursor reaches the left locator, recording is automatically activated. When the cursor reaches the right locator, recording is deactivated, but playback continues for the time set in the **Post-roll Amount** field before stopping.

Playing Back with the Shuttle Speed Wheel

The shuttle speed wheel allows you to play back the project at up to four times the playback speed, forwards or backwards. This is a quick way to locate or cue to any position in the project.

- To start playback, turn the shuttle speed wheel to the right.

  The further you turn the wheel, the faster the playback speed.

- To play the project backwards, turn the wheel to the left.

  The further you turn the wheel, the faster the playback speed.

- To activate insert effects for scrubbing with the shuttle speed wheel, select **File > Preferences > Transport > Scrub** and activate **Use Inserts While Scrubbing**.

  By default, insert effects are bypassed.

NOTE

You can also access the shuttle speed wheel via a remote control device.

Project Scrubbing - The Jog Wheel

The jog wheel allows you to move the playback position forwards or backwards, much like scrubbing on a tape deck. This helps you pinpoint exact locations in the project.

- To move to another playback position, turn the jog wheel to the left or right.

  The further you turn the jog wheel, the faster the playback speed. The original playback speed is the fastest speed possible. You can turn the jog wheel as many times as needed to move to a location.

  If you click the jog wheel during playback, playback automatically stops and scrubbing starts.

- To activate insert effects for scrubbing with the jog wheel, select **File > Preferences > Transport > Scrub** and activate **Use Inserts While Scrubbing**.

  By default, insert effects are bypassed.

NOTE

You can also access the jog wheel via a remote control device.

Transport Menu

The **Transport** menu contains several transport functions as well as many other options related to playback and recording.

Open Function

Transport Panel

Opens the **Transport** panel.

Locate Functions

Locators to Selection

Sets the locators to encompass the selection.

Locate Selection

Moves the project cursor to the beginning of the selection.

Locate Selection End

Moves the project cursor to the end of the selection.

Locate Next/Previous Marker

Moves the project cursor to the closest marker to the right or left.

Locate Next/Previous Hitpoint

Moves the project cursor to the next or to the previous hitpoint on the selected track.

Locate Next/Previous Event

Moves the project cursor to the next or to the previous event on the selected track.

Playback Functions

Post-roll from Selection Start/End

Starts playback from the beginning or end of the currently selected range and stops after the time set in the post-roll field on the transport panel.

Pre-roll to Selection Start/End

Starts playback from a position before the start or end of the currently selected range and stops at the selection start or end, respectively. The playback start position is set in the pre-roll field on the transport panel.

Play from Selection Start/End

Activates playback from the beginning or end of the current selection.

Play until Selection Start/End

Activates playback two seconds before the start or end of the current selection and stops at the selection start or end, respectively.

Play until Next Marker

Activates playback from the project cursor and stops at the next marker.

Play Selection Range

Activates playback from the start of the current selection and stops at the selection end.

Loop Selection

Activates playback from the start of the current selection and keeps starting over again when reaching the selection end.

Record Functions

Re-Record Mode

Activates/Deactivates the re-record mode that allows you to reinitiate a recording with a single click.

Start Recording at Left Locator

If this is activated, the project cursor locates to the left locator when you click the record button.

Use Pre-/Post-roll

Activates the pre-roll/post-roll.

Retrospective Record

Allows you to capture MIDI notes that you play in stop mode or during playback. Therefore, you need to enable the **Retrospective Record** option (**File > Preferences > Record > MIDI**).

Edit Function

Edit Mode

If this option is activated, the project cursor automatically follows when you make selections or when you perform editing operations.

In **Stop** mode, the project cursor is hidden from the event display. However, it is always visible in the ruler.

Metronome Functions

Metronome Setup

Opens the **Metronome Setup** dialog.

Metronome On/Off

Activates/Deactivates the metronome click.

Precount On/Off

Activates/Deactivates the precount.

Synchronization Functions

Project Synchronization Setup

Opens the **Project Synchronization Setup** dialog.

Use External Sync

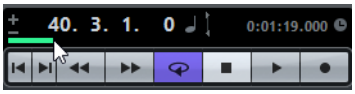
Sets Nuendo to be synchronized externally.

Setting the Project Cursor Position

To move the project cursor, do one of the following:

- Use fast forward and rewind.
- Use the jog/shuttle/nudge control on the **Transport** panel.
- Drag the project cursor in the lower part of the ruler.
- Click in the ruler.
  Double-clicking in the ruler moves the cursor and starts/stops playback.

- If **Locate when Clicked in Empty Space** is activated (**File > Preferences > Transport**), you can click anywhere in an empty section of the **Project** window to move the cursor position.
- Change the value in any of the position displays.
- Use the position slider above the transport buttons in the **Transport** panel.



The range of the slider relates to the length setting in the **Project Setup** dialog. Hence, moving the slider all the way to the right takes you to the end of the project.

- Use markers.
- Use the playback options.
- Use the arranger function.
- Use the functions on the **Transport** menu.
- Use key commands.

NOTE

If **Snap** is activated when dragging the project cursor, the snap value is taken into account. This is helpful for finding exact positions quickly.

RELATED LINKS

Markers on page 312
Transport Menu on page 224
Arranger Track on page 290
Playing Back with the Shuttle Speed Wheel on page 223

Left and Right Locators

The left and right locators are a pair of markers that you can use for specifying punch-in and punch-out positions, and cycle boundaries.

Locators are indicated by the flags in the ruler. The area between the locators is highlighted in the ruler and the event display.

If the right locator is positioned before the left locator, the area between the locators is shown in a different color.

Setting the Locators

There are several ways to set the locator positions.

To set the left locator, do one of the following:

- Drag the left handle in the ruler.
- Press [Ctrl]/[Command] and click at the position in the ruler.
- Adjust the **Left Locator Position** value on the **Transport** panel.

To set the left locator to the project cursor position, do one of the following:

- Press [Ctrl]/[Command], and on the numeric keypad press [1].
- Press [Alt]/[Option] and click **L** on the **Transport** panel.

To set the right locator, do one of the following:

- Drag the right handle in the ruler.
- Press [Alt]/[Option] and click at the position in the ruler.
- Adjust the **Right Locator Position** value on the **Transport** panel.

To set the right locator to the project cursor position, do one of the following:

- Press [Ctrl]/[Command] and on the numeric keypad press [2].
- Press [Alt]/[Option] and click **R** on the **Transport** panel.

To set both locators, do one of the following:

- Click and drag left or right in the upper half of the ruler.
- Select a range or an event and select **Transport > Locators to Selection**.
- Double-click a cycle marker.

Auto-Scroll

Auto-Scroll allows the waveform display to scroll during playback, keeping the project cursor visible in the window.

- To activate **Auto-Scroll**, click the **Auto-Scroll** button on the toolbar.
- To keep the project cursor in the middle of the screen, select **File > Preferences > Transport** and activate **Stationary Cursors**.

NOTE

Auto-Scroll is available in the toolbar of the **Project** window and in all editors.

Suspend Auto-Scroll when Editing

If you do not want the **Project** window display to change when editing during playback, you can activate **Suspend Auto-Scroll when Editing**.

The **Suspend Auto-Scroll when Editing** button is located to the right of the **Auto-Scroll** button.

When this option is activated, auto-scrolling is suspended as soon as you click anywhere in the event display during playback. As a visual feedback for that, the **Auto-Scroll** button turns orange.

As soon as playback stops or when you click the **Auto-Scroll** button again, Nuendo will return to the normal **Auto-Scroll** behavior.

Time Formats

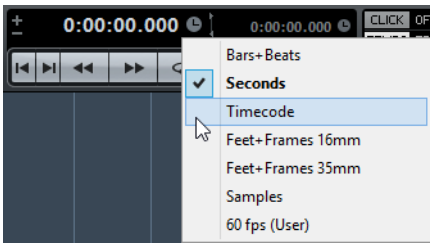
You can set up different time formats.

Selecting the Primary Time Format

In the **Transport** panel, you can select the primary time format. This is the global display format that is used for all rulers and position displays in the program, except the ruler tracks.

PROCEDURE

1. In the main transport section of the **Transport** panel, click **Select Primary Time Format**.
2. Select a time format from the pop-up menu.



You can also select **Project > Project Setup > Display Format** to select the primary time format.

RESULT

The time format in the **Transport** panel and all rulers and position displays are updated.

Independent Time Displays

You can show time displays that are independent from the global display format.

To select an independent time display, do one of the following:

- In the ruler of the **Project** window or any editor, click the arrow button to the right of the ruler.
- Select **Project > Add Track > Ruler** to add a ruler track, and right-click the ruler.
- In the **Main Transport** section of the **Transport** panel, click **Select Secondary Time Format**.

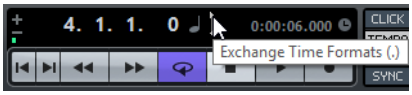
RELATED LINKS

Ruler on page 49
Ruler Track on page 128

Switching the Primary and Secondary Time Format

PROCEDURE

- In the **Main Transport** section of the **Transport** panel, click **Exchange Time Format**.



RESULT

The primary and secondary time formats are switched and all rulers and position displays are updated.

Locating to Specific Time Positions

You have several possibilities to locate to specific time positions in the **Project** window.

- In the **Transport** panel, use the functions in the **Main Transport** section or in the **Jog/Scrub** section.
- In the **Transport** panel, use the position slider above the transport buttons.
- In the ruler, click the time position that you want to locate to.

  Double-click to start/stop playback.
- In the lower part of the ruler, drag the project cursor.
- Use the following **Transport** menu functions:

  - **Locate Selection/Locate Selection End**
  - **Locate Next Marker/Locate Previous Marker**
  - **Locate Next Hitpoint/Locate Previous Hitpoint**
  - **Locate Next Event/Locate Previous Event**

- On the **Transport** panel, change the value of the **Primary Time Display**.

  NOTE

  In the **Preferences** dialog on the **Transport** page, you can select different options for entering a timecode.

- Use markers.
- Use the arranger functions.
- Use locators.

  On the numeric keypad, press [1] to go to the left locator position, and press [2] to go to the right locator position.

  On the **Transport** panel, click **L** to go to the left locator, and click **R** to go to the right locator.

NOTE

If **Snap** is activated, the snap value is taken into account. This is helpful for finding exact positions quickly.

RELATED LINKS

Timecode Input Scheme on page 1278

Metronome

You can use the metronome click as a timing reference. The two parameters that govern the timing of the metronome are tempo and time signature.

- To activate the metronome click, activate the **Click** button on the **Transport** panel.

  You can also select **Transport > Metronome On** or use the corresponding key command.

- To activate the precount, click the **Precount** button on the **Transport** panel.

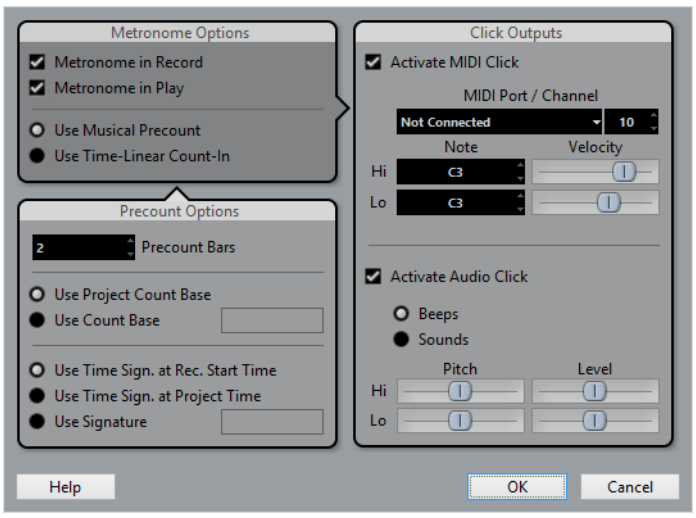
  You can also select **Transport > Precount On** or set up a key command for this.

- To set up the metronome, select **Transport > Metronome Setup**.

Metronome Setup

You can make settings for the metronome in the **Metronome Setup** dialog.

- To open the **Metronome Setup** dialog, select **Transport > Metronome Setup**.



Metronome Options Section

In the **Metronome Options** section, the following options are available:

Metronome in Record

Allows you to activate the metronome click during recording.

Metronome in Play

Allows you to activate the metronome click during playback.

Use Musical Precount

Allows you to activate a musical count-in that is played when you start recording from stop mode.

Use Time-Linear Count-In

Allows you to activate a time-based count-in that is played when you start recording from stop mode.

Precount Options Section

This section is only available, if you activate **Use Musical Precount** in the **Metronome Options** section. In the **Precount Options** section, the following options are available:

Precount Bars

Allows you to set the number of bars that the metronome counts in before recording starts.

Use Project Count Base

Activate this to let the metronome play one click per beat according to the project count base.

Use Count Base

Activate this to set the rhythm of the metronome. For example, setting this to 1/8, gives you eighth notes (two clicks per beat).

Use Time Sign. at Rec. Start Time

Activate this to let the precount automatically use the time signature and tempo set at the position where recording starts.

Use Time Sign. at Project Time

Activate this to let the precount use the time signature set on the tempo track and apply any tempo changes on the tempo track during the precount.

Use Signature

Allows you to set a time signature for the precount. In this mode, tempo changes on the tempo track do not affect the precount.

Count-In Options Section

This section is only available, if you activate **Use Time-Linear Count-In** in the **Metronome Options** section. In the **Count-In Options** section, the following options are available:

Count-In Clicks

This allows you to set the number of clicks you hear before playback or recording starts.

Interval in Seconds

This allows you to define a time interval for the clicks. You can calculate the position of the first click by multiplying the count-in click value with the specified interval and subtracting this value from the position of the left locator.

Emphasis

This allows you to select an emphasized click. This is useful if you want to have an audible difference between the first and/or last click and the other clicks.

Click Outputs Section

In the **Click Outputs** section, the following options are available:

Activate MIDI Click

Allows you to activate the MIDI click.

MIDI Port/Channel

Allows you to select a MIDI output and channel for the MIDI click. You can also select a VST instrument previously set up in the **VST Instruments** window.

Hi Note/Velocity

Allows you to set the MIDI note number and velocity value for the first beat in a bar, the high note.

Lo Note/Velocity

Allows you to set the MIDI note number and velocity for the other beats, the low notes.

Activate Audio Click

Allows you to activate the audio click that sounds via the audio hardware.

Beeps

Allows you to activate beeps generated by the program. Adjust the pitch and level of the beeps for the Hi (first) beat and Lo (other) beats using the sliders below.

Sounds

Allows you to load audio files for the Hi and Lo metronome sounds in the Sound fields below. The sliders set the level of the click.

Setting Up a Time-Based Count-In

In postproduction scenarios, it is useful to set up a time-linear count-in as a timing reference for your recordings, as projects are rather time based than referencing to bars and beats.

A typical use case would be the synchronization of voice-overs or dubbing versions. In these scenarios, you find yourself frequently jumping to positions from which you want the recording to start. By setting the locators to the sections that you want to record and defining a time-linear count-in, you can quickly assign, locate, and hear the record start position in your project.

PROCEDURE

1. On the **Transport** panel, activate **Click** to activate the metronome click.
2. Set up a suitable pre-roll value and activate **Pre-roll**.
3. Open the **Transport** menu and activate **Start Record at Left Locator**.
4. Select **Transport > Metronome Setup**.
5. Activate **Metronome in Record**.
6. Activate **Use Time-Linear Count-In** and set up the **Count-In Options** according to your needs.
7. Click **OK** to save your settings and close the dialog.

8. Set the locators to the section that you want to record and activate recording.

   If you want to record several sections, set up cycle markers for all sections that you want to record.

RESULT

Your project is played back from the current project cursor position. When the project cursor reaches the position specified with the **Count-In Clicks** and **Interval in seconds** parameters, the count-in is triggered. It stops when the cursor reaches the left locator and recording starts.

NOTE

You can also set the left locator to the position where you want recording to start, set the project cursor to a position before the left locator, activate the **Punch In** button on the **Transport** panel and start playback. The defined time-linear count-in is triggered as the project cursor moves towards the left locator. When it reaches the left locator, recording is automatically activated.

Chase

Chase is a function that makes sure your MIDI instruments sound as they should when you locate to a new position and start playback. This is accomplished by the program transmitting a number of MIDI messages to your instruments each time that you move to a new position in the project, making sure all MIDI devices are set up correctly with regard to program change, controller messages (such as MIDI Volume), etc.

EXAMPLE

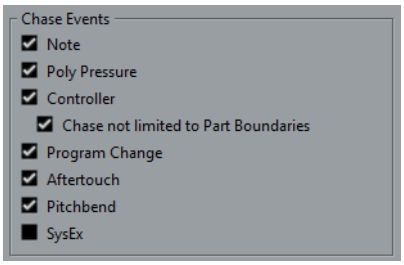
You have a MIDI track with a program change event inserted at the beginning. This event makes a synth switch to a piano sound.

At the beginning of the first chorus you have another program change event which makes the same synth switch to a string sound.

You now play back the song. It begins with the piano sound and then switches to the string sound. In the middle of the chorus you stop and rewind to some point between the beginning and the second program change. The synth now still plays the string sound although in this section it really should be a piano.

The **Chase** function takes care of that. If program change events are set to be chased, Nuendo tracks the music back to the beginning, finds the first program change, and transmits it to your synth, setting it to the correct sound.

The same thing can apply to other event types as well. The **Chase Events** settings (**File > Preferences > MIDI**) determine which event types are chased when you locate to a new position and start playback.



Activated event types are chased.

RELATED LINKS

Chase Events on page 1265

Virtual Keyboard (NEK only)

The Virtual Keyboard allows you to play and record MIDI notes by using your computer keyboard or mouse. This is useful if you have no external MIDI instrument at hand and you do not want to draw in notes with the Draw tool.

When the Virtual Keyboard is displayed, the usual key commands are blocked because they are reserved for the Virtual Keyboard. The only exceptions are:

- Save: [Ctrl]/[Command]-[S]
- Start/Stop Record: Num [*]
- Start/Stop Playback: [Space]
- Jump to left locator: Num [1]
- Delete: [Delete] or [Backspace]
- Cycle on/off: Num [/]
- Show/Hide Transport panel: [F2]
- Show/Hide Virtual Keyboard: [Alt]/[Option]-[K]

Recording MIDI With the Virtual Keyboard

PREREQUISITE

You have selected a MIDI or instrument track and activated **Record Enable**.

PROCEDURE

1. Select **Devices > Virtual Keyboard**.
   The Virtual Keyboard is displayed in the Transport panel.
2. On the **Transport** panel, activate **Record**.
3. Perform one of the following actions to enter some notes:
   - Click on the keys of the virtual keyboard.

- Press the corresponding key on your computer keyboard.

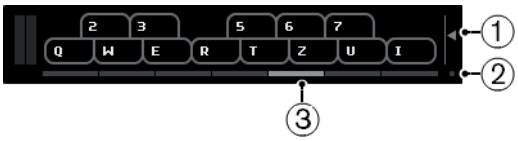
NOTE

Press several keys simultaneously to enter polyphonic parts. The maximum number of notes that can be played at one time varies between the different operating systems and hardware configurations.

AFTER COMPLETING THIS TASK

Close the virtual keyboard to make all key commands available again.

Virtual Keyboard Options



1) **Note Velocity Level**

This slider allows you to adjust the volume of the virtual keyboard. You can also use the up and down arrow keys for this.

2) **Change Virtual Keyboard Display Type**

This button allows you to switch between computer keyboard and piano keyboard display mode.

The computer keyboard mode, you can use the two rows of keys that are displayed on the Virtual Keyboard to enter notes.

The piano keyboard has a wider range of keys. It allows you to enter more than one voice simultaneously. You can also use the [Tab] key for this.

3) **Octave Offset**

These buttons allow you to switch the keyboard range to a lower or higher octave. You have seven full octaves at your disposal. You can also use the left and right arrow keys for this.

4) **Pitchbend/Modulation Sliders**

These sliders are only available in piano keyboard mode. They allow you to introduce pitchbend and modulation. You can also click on a key, hold the mouse button pressed until the mouse pointer becomes a cross-hair cursor and drag upwards/downward to introduce modulation or drag left/right to create pitchbend.

Recording

In Nuendo, you can record audio and MIDI.

This chapter assumes that you are familiar with certain basic recording concepts and that some initial preparations have been made.

- Set up, connect, and calibrate your audio hardware.
- Open a project and set up the project setup parameters according to your specifications.

  Project setup parameters determine the record format, sample rate, project length, etc. that affect the audio recordings that you make during the course of the project.
- If you plan to record MIDI, set up and connect your MIDI equipment.

RELATED LINKS

Setting Up Audio on page 13
Setting Up MIDI on page 19

Basic Recording Methods

This section describes the general recording methods.

Record Enabling Tracks

To be able to record, you must record-enable the tracks on which you want to record.

- To record-enable a track, activate the **Record Enable** button in the track list, in the Inspector, or in the MixConsole.
- To record-enable all audio tracks simultaneously, set up a key command for **Activate Record Enable for all Audio Tracks** in the **Mixer** category of the **Key Commands** dialog and use it.
- To record-enable audio or MIDI tracks on selection, activate the **Enable Record on Selected Audio Track** or the **Enable Record on Selected MIDI Track** option (**File > Preferences > Editing > Project & MixConsole**).

NOTE

The exact number of audio tracks that you can record simultaneously depends on your computer CPU and hard disk performance. Activate the **Warn on Processing Overloads** option (**File > Preferences > VST**) to show a warning message as soon as the CPU overload indicator lights up during recording.

RELATED LINKS

Editing - Project & MixConsole on page 1257
VST on page 1279

Activating Recording

You can activate recording manually or automatically.

Activating Recording Manually

- To activate recording, click the **Record** button on the **Transport** panel or on the toolbar. You can also use the corresponding key command, by default [*] on the numeric keypad.

Recording starts from the current cursor position.

NOTE

When you start recording in **Stop** mode, you can start recording from the left locator by activating **Start Record at Left Locator** on the **Transport** menu. The pre-roll setting or the metronome count-in will be applied.

Activating Recording Automatically

Nuendo can automatically switch from playback to recording at a given position. This is useful if you must replace a section of a recording and want to listen to what is already recorded up to the recording start position.

PROCEDURE

1. Set the left locator to the position where you want to start recording.
2. Activate the **Punch In** button on the **Transport** panel.
3. Activate playback from any position before the left locator.

   When the project cursor reaches the left locator, recording is automatically activated.

Stopping Recording

- To stop recording and playback, click the **Stop** button on the **Transport** panel or use the corresponding key command, by default [0] on the numeric keypad.
- To stop recording and continue playback, click the **Record** button or use the corresponding key command, by default [*] on the numeric keypad.
- To stop recording automatically when the project cursor reaches the right locator and continue playback, activate the **Punch Out** button on the **Transport** panel.

Cycle Recording

You can record in a cycle, that is you can record a selected section repeatedly and seamlessly.

PREREQUISITE

A cycle is set up with the left and right locators.

PROCEDURE

1. Click the cycle button on the **Transport** panel to activate cycle mode.
2. Activate recording from the left locator, before or within the cycle.

   As soon as the project cursor reaches the right locator, it jumps back to the left locator and continues recording a new lap.

RESULT

The results of cycle recording depend on the selected record mode. They also differ for audio and MIDI.

RELATED LINKS

Recording MIDI on page 254
Recording Audio on page 248

Using Pre-Roll and Post-Roll

You can set up a pre-roll and a post-roll for recording.

PREREQUISITE

Select **File > Preferences > Transport** and activate the **Stop after Automatic Punch Out** option.

PROCEDURE

1. Set the locators to where you want to start and end recording.
2. On the **Transport** panel, activate **Auto Punch In** and **Auto Punch Out**.
3. Activate **Use Pre-roll** and **Use Post-roll**.
4. Specify a **Pre-roll Amount** and a **Post-roll Amount**.
5. Click **Record**.

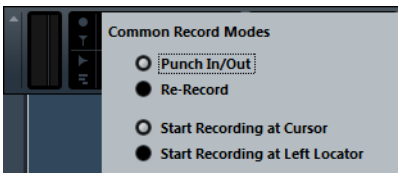
RESULT

The project cursor rolls back and starts playback at the time that has been set as pre-roll amount. When the cursor reaches the left locator, recording is automatically activated. When the cursor reaches the right locator, recording is deactivated, and the playback continues as long as the time that has been set as post-roll amount.

Common Record Modes

The **Common Record Modes** determine what happens if you click the **Record** button during an audio or MIDI recording.

- In the **Transport** panel, click the upper part of the **Record Modes** section to open the **Common Record Modes** pop-up menu.



Punch In/Out

In this mode, the recording is stopped.

Re-Record

In this mode, the recording is reinitiated, the events are removed and recording is restarted from the exact same position.

Start Recording at Cursor

In this mode, recording starts from the cursor position.

Start Recording at Left Locator

In this mode, recording starts from the left locator.

Re-Recording

PROCEDURE

1. Activate **Transport > Re-Record**.
2. Activate recording.
3. Hit the **Record** button again to restart recording.

RESULT

The project cursor jumps back to the record start position and recording is reinitiated. Pre-roll and pre-count settings are taken into account.

NOTE

The previous recordings are removed from the project and cannot be retrieved using **Undo**. However, they remain in the **Pool**.

Monitoring

In Nuendo, monitoring means listening to the input signal while preparing to record or while recording.

The following ways of monitoring are available.

- Via Nuendo.
- Externally by listening to the signal before it reaches Nuendo.
- By using ASIO Direct Monitoring.

  This is a combination of both other methods.

Monitoring via Nuendo

If you use monitoring via Nuendo, the input signal is mixed with the audio playback. This requires an audio hardware configuration with a low latency value.

PROCEDURE

1. In the track list, activate the **Monitor** button.

2. In the **MixConsole**, adjust the monitoring level and the panning.

   You can add effects and EQ to the monitor signal using the track's channel. If you are using plug-in effects with large inherent delays, the automatic delay compensation function in Nuendo will increase the latency. If this is a problem, you can use the Constrain Delay Compensation function while recording.

3. Select **File > Preferences > VST**.
4. Open the **Auto Monitoring** pop-up menu and select a monitoring mode.

RESULT

The monitored signal will be delayed according to the latency value which depends on your audio hardware and drivers. You can check the latency of your hardware in the **Device Setup** dialog (**Device > Device Setup > VST Audio System**).

RELATED LINKS

VST on page 1279

External Monitoring

External monitoring means listening to the input signal before it is sent into Nuendo. It requires an external mixer for mixing the audio playback with the input signal. The latency value of the audio hardware configuration does not affect the monitor signal. When using external monitoring, you cannot control the level of the monitor signal from within Nuendo or add VST effects or EQ to the monitor signal.

PROCEDURE

1. Select **File > Preferences > VST**.
2. Open the **Auto Monitoring** pop-up menu and select **Manual**.
3. Deactivate the **Monitor** buttons in Nuendo.
4. On your mixing desk or mixer application for your audio hardware, activate the **Thru** or **Direct Thru** mode to send the input audio back out again.

ASIO Direct Monitoring

If your audio hardware is ASIO 2.0 compatible, it may support ASIO Direct Monitoring. This feature may also be available for audio hardware with Mac OS X drivers. In ASIO Direct Monitoring mode, the monitoring is done in the audio hardware, and monitoring is controlled from Nuendo. The latency value of the audio hardware configuration does not affect the monitor signal when using ASIO Direct Monitoring.

PROCEDURE

1. In the track list, activate the **Monitor** button.

2. Select **Devices > Device Setup**.

3. In the **Device Setup** dialog, select your driver in the **Devices** list on the left to display the driver settings for your audio hardware, and activate the **Direct Monitoring** checkbox.

   If the checkbox is grayed out, your audio hardware (or its driver) does not support ASIO Direct Monitoring. Consult the audio hardware manufacturer for details.

4. Select **File > Preferences > VST**.
5. Open the **Auto Monitoring** pop-up menu and select a monitoring mode.
6. In the MixConsole, adjust the monitoring level and panning.

   Depending on the audio hardware, this might not be possible.

After Completing This Task

You can monitor the input levels of audio tracks, that is, you can map the input bus metering to monitor-enabled audio tracks and watch the input levels of your audio tracks when working in the **Project** window.

- Select **File > Preferences > Metering** and activate **Map Input Bus Metering to Audio Track (in Direct Monitoring)**.

  As the tracks are mirroring the input bus signal you will see the same signal in both places. When using mapped metering, any functions that you apply to the audio track are not reflected in its meters.

Note

When using Steinberg hardware (MR816 series) in combination with ASIO Direct Monitoring, monitoring will be virtually latency-free. If you are using RME Audio Hammerfall DSP audio hardware, make sure that the pan law is set to -3dB in the card's preferences.

Note

With Direct Monitoring activated, Direct Routing can not be used for routing destinations 2-8. Only the Main bus can be used for Direct Monitoring.

Related Links

VST on page 1279

Monitoring MIDI Tracks

You can monitor everything you play and record though the MIDI output and channel that are selected for the MIDI track.

Prerequisite

Local Off is activated on your MIDI instrument.

Procedure

1. Select **File > Preferences > MIDI**.
2. Make sure **MIDI Thru Active** is activated.

3. In the track list, activate the **Monitor** button.

RESULT

Incoming MIDI is echoed back out again.

RELATED LINKS

MIDI on page 1265

Audio Recording Specifics

Preparations

Selecting a Record File Format

You can set up the record file format, that is the sample rate, bit resolution, and record file type for new audio files.

PROCEDURE

1. Select **Project > Project Setup**.
2. Set up the settings for **Sample Rate**, **Bit Resolution**, and **Record File Type**.

   IMPORTANT

   The bit resolution and file type can be changed at any time while the sample rate of a project cannot be changed at a later stage.

RELATED LINKS

Creating New Projects on page 69

Setting the Audio Record Folder

Each Nuendo project has a project folder containing an **Audio** folder. By default, this is where recorded audio files are stored. However, you can select record folders independently for each audio track if needed.

PROCEDURE

1. In the track list, select all tracks that you want to assign the same record folder.
2. Right-click one of the tracks to open the context menu.
3. Select **Set Record Folder**.

   A file dialog opens.

4. Navigate to the folder that you want to use as record folder or create a new folder with the **New Folder** button.

   If you want to have separate folders for different types of material (speech, ambient sounds, music, etc.), you can create subfolders within the project **Audio** folder and assign different tracks to different subfolders. This way, all audio files will still reside within the project folder, which will make managing the project easier.

Getting the Track Ready for Recording

Creating a Track and Setting the Channel Configuration

PROCEDURE

1. Select **Project > Add Track > Audio**.
2. In the **Count** field, enter the number of tracks that you want to add.
3. Open the **Configuration** pop-up menu and select a channel configuration.
4. Optional: Enter a track name.
5. Click **Add Track**.

RELATED LINKS

Add Track Dialog on page 142

RAM Requirements for Recording

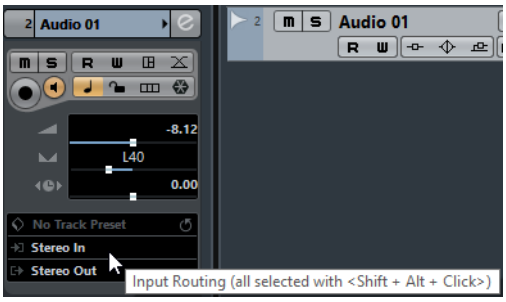
Each track on which you record requires a certain amount of RAM, and the memory usage increases the longer the recording lasts. For each audio channel, 2.4 MB of RAM are required for MixConsole settings, etc. The memory usage increases with the length of the recording, the sample rate, and the number of tracks you record. Consider the RAM limitation of your operating system when setting up your project for recording.

Selecting an Input Bus for the Track

Before you can record on your track, you must add and set up the required input busses and specify from which input bus the track will record.

PROCEDURE

1. In the **Inspector** for the audio track, open the **Input Routing** pop-up menu.



2. Select an input bus.

RELATED LINKS

Setting Up the Input and Output Ports on page 18
Setting Up Busses on page 17
Audio Track Inspector on page 87

Recording Audio

You can record audio using any of the basic recording methods.

When you finish recording, an audio file is created in the **Audio** folder within the project folder. In the Pool, an audio clip is created for the audio file, and an audio event that plays the whole clip appears on the recording track. Finally, a waveform image is calculated for the audio event. If the recording was very long, this may take a while.

NOTE

The waveform image will be calculated and displayed during the actual recording process. This realtime calculation uses some processing power. If your processor is slow or if you are working on a CPU-intensive project, select **File > Preferences > Record > Audio** and deactivate **Create Audio Images During Record**.

RELATED LINKS

Activating Recording on page 240
Cycle Recording on page 241

Audio Record Modes

By selecting an **Audio Record Mode** you decide what happens to your recording and to any existing events on the track where you are recording. This is necessary because you will not always record on an empty track. There may be situations where you record over existing events, especially in cycle mode.

- To select an **Audio Record Mode**, click the audio symbol in **Record Mode** section of the **Transport** panel and select a record mode.
- To close the **Audio Record Mode** panel, click anywhere outside the panel.

Keep History

Existing events or portions of events that are overlapped by a new recording are kept.

Cycle History + Replace

Existing events or portions of events that are overlapped by a new recording are replaced by the new recording. However, if you record in cycle mode, all takes from the current cycle recording are kept.

Replace

Existing events or portions of events that are overlapped by a new recording are replaced by the last recorded take.

Recording with Effects

Nuendo allows you to add effects and/or EQ directly while recording. This is done by adding insert effects and/or making EQ settings for the input channel in the MixConsole.

IMPORTANT

If you record with effects, the effects become part of the audio file itself. You cannot change the effect settings after recording.

When you are recording with effects consider using 32-bit float format. This way, the bit resolution will not be reduced, which means there is no risk of clipping at this stage. Also, this preserves the signal quality perfectly. If you record in 16-bit or 24-bit format, the available headroom is lower, which means clipping can occur if the signal is too loud.

Recording a Mix of Separate Tracks

You can create a downmix of separate tracks, bass drum, hi-hats, or snare, for example. This is done by selecting an output bus, a group bus, or an FX channel bus as an input for your recording.

PROCEDURE

1. Set up your separate tracks and add a group track.
2. For each of the drum tracks, open the **Output Routing** pop-up menu and select the group track as output.
3. Create a new audio track, open the **Input Routing** pop-up menu for it and select the group track as input for this audio track.
4. Record-enable this audio track and start recording.

RESULT

The output of the group track will be recorded on the new track and you will get a mix of your separate tracks.

NOTE

You can also select an FX channel as recording source. In this case, only the output of the FX channel will be recorded.

RELATED LINKS

Routing on page 383

Undoing Recording

If you decide that you do not like what you just recorded, you can delete it.

- Select **Edit > Undo**.

This removes the events that you just recorded from the **Project** window and moves the audio clips in the Pool to the trash folder. To remove the recorded audio files from the hard disk, open the Pool, right-click the **Trash** icon and select **Empty Trash**.

RELATED LINKS

Pool Window on page 573

Recovering Audio Recordings

Nuendo allows you to recover audio recordings in two situations: if you specified an audio pre-record time when you hit the record button too late and after a system failure during recording.

Specifying an Audio Pre-Record Time

You can capture up to 1 minute of any incoming audio that you play in Stop mode or during playback. This is possible because Nuendo can capture audio input in buffer memory, even when not recording.

PROCEDURE

1. Select **File > Preferences > Record > Audio**.
2. Specify a time (up to 60 seconds) in the **Audio Pre-Record Seconds** field.

   This activates the buffering of audio input, making pre-record possible.
3. Make sure that an audio track is record-enabled and receives audio from the signal source.
4. When you have played some audio material that you want to capture (either in Stop mode or during playback), click the **Record** button.
5. Stop the recording after a few seconds.

   This creates an audio event that starts where the cursor position was when you activated recording. If you were in stop mode, and the cursor was at the beginning of the project, you may have to move the event to the right in the next step. If you were playing along to a project, you leave the event where it is.
6. Select the **Object Selection** tool and place the cursor on the bottom left edge of the event so that a double arrow appears. Then click and drag to the left.

RESULT

The event is now extended, and the audio that you played before activating the recording is inserted. This means that if you played along during playback, the captured notes end up exactly where you played them in relation to the project.

RELATED LINKS

Record - Audio on page 1272

Recovering Audio Recordings after System Failure

Nuendo allows you to recover audio recordings after a system failure, because of a power cut or other mishap, for example.

When you experience a computer crash during a recording, relaunch the system and check the project record folder. By default, this is the **Audio** subfolder inside the project folder. It should contain the audio file that you recorded, from the moment when you started recording to the time when your computer crashed.

NOTE

- This feature does not constitute an overall guarantee by Steinberg. While the program itself was improved in such a way that audio recordings can be recovered after a system failure, it is always possible that a computer crash, power cut, etc. might have damaged another component of the computer, making it impossible to save or recover any of the data.

- Do not try to actively bring about this kind of situation to test this feature. Although the internal program processes have been improved to cope with such situations, Steinberg cannot guarantee that other parts of the computer are not damaged as a consequence.

MIDI Recording Specifics

Preparations

The preparations described in the following sections mainly focus on external MIDI devices.

MIDI Instruments and Channels

Most MIDI synthesizers can play several sounds at the same time, each on a different MIDI channel. This allows you to play back several sounds (bass, piano, etc.) from the same instrument.

Some devices, such as General MIDI compatible sound modules, always receive on all 16 MIDI channels. If you have such an instrument, there is no specific setting to make in the instrument.

On other instruments, you must use the front panel controls to set up a number of parts, timbres, or similar so that they all receive on one MIDI channel.

For more information, see the manual that came with your instrument.

Naming MIDI Ports

MIDI inputs and outputs are often displayed with long and complicated names. In Nuendo, you can rename your MIDI ports to more descriptive names.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Devices** list, select **MIDI Port Setup**.
   The available MIDI inputs and outputs are listed. On Windows systems, the device to choose depends on your system.
3. Click in the **Show As** column and type in a new name.
4. Click **OK**.

RESULT

The new port names appear on the **MIDI Input** and **Output Routing** pop-up menus.

Setting the MIDI Input

In the **Inspector**, you set the MIDI input for the track.

PROCEDURE

1. In the track list, select the track to which you want to assign a MIDI input.
2. In the topmost **Inspector** section, open the **Input Routing** pop-up menu and select an input.

   The available inputs on the menu depend on the type of MIDI interface that you are using. If you hold down [Shift]-[Alt]/[Option], the selected MIDI input is used for all selected MIDI tracks.

   NOTE

   If you select **All MIDI Inputs**, the track will receive MIDI data from all available MIDI inputs.

Setting the MIDI Channel and Output

The MIDI channel and output settings determine where the recorded MIDI is routed during playback. They are also relevant for monitoring MIDI in Nuendo. You can select the channel and output in the track list or in the Inspector.

PROCEDURE

1. In the track list, select the track to which you want to assign a MIDI channel and output.
2. In the topmost **Inspector** section, open the **Output Routing** pop-up menu and select an output.

   The available outputs on the menu depend on the type of MIDI interface that you are using. If you hold down [Shift]-[Alt]/[Option], the selected MIDI output is used for all selected MIDI tracks.
3. Open the **Channel** pop-up menu and select a MIDI channel.

   NOTE

   If you select the **Any** MIDI channel, the MIDI material is routed to the channels that are used by your MIDI instrument.

Selecting a Sound

You can select sounds from within Nuendo by instructing the program to send Program Change and Bank Select messages to your MIDI device.

PROCEDURE

1. In the track list, select the track to which you want to assign a sound.
2. In the track list or the **Inspector**, open the **Program Selector** pop-up menu and select a program.

   Program Change messages give access to 128 different program locations.
3. If your MIDI instruments have more than 128 programs, you can open the **Bank Selector** pop-up menu and select different banks, each containing 128 programs.

   NOTE

   Bank Select messages are recognized differently by different MIDI instruments. The structure and numbering of banks and programs may also vary. Refer to the documentation of your MIDI instruments for details.

RELATED LINKS

MIDI Track Inspector on page 102

Recording MIDI

You can record MIDI using any of the basic recording methods.

When you finish recording, a part that contains MIDI events is created in the **Project** window.

NOTE

If you perform a live recording on a VST instrument, you usually compensate the latency of the audio card by playing earlier. In consequence, the timestamps are recorded too early. If you activate the **ASIO Latency Compensation** button on the track list, all recorded events are moved by the current latency setting.

The following preferences affect MIDI recording:

- Length Adjustment
- Snap MIDI Parts to Bars
- Solo Record in MIDI Editors
- MIDI Record Catch Range in ms
- ASIO Latency Compensation Active by Default

You can find them on the **MIDI** and **Record–MIDI** page of the **Preferences** dialog.

RELATED LINKS
MIDI on page 1265
Record - MIDI on page 1272

Recording Different Types of MIDI Messages

You can record different types of MIDI messages.

- To specify which event types are recorded, select **File > Preferences > MIDI > MIDI Filter** and deactivate the options for the type of MIDI message that you want to record.

RELATED LINKS
MIDI - MIDI Filter on page 1269

Recording MIDI Notes

If you press and release a key on your synthesizer or on another MIDI keyboard, the following messages are recorded:

- Note On (key down)
- Note Off (key up)
- MIDI channel

NOTE

Normally, the MIDI channel information is overridden by the MIDI channel setting for the track. However, if you set the track to the **Any** MIDI channel, the notes will be played back on their original channels.

Recording Continuous Messages

Pitchbend, aftertouch, and controllers, such as modulation wheel, sustain pedal, volume, etc. are considered as MIDI continuous events, as opposed to the momentary key down and key up messages.

You can record continuous messages together or independently from the notes, that is, afterwards or before.

You can record continuous messages on their own tracks, separately from the notes to which they belong. As long as you set the two tracks to the same output and MIDI channel, it will appear to the MIDI instrument as if you made the two recordings at the same time.

Recording Program Change Messages

When you switch from one program to another on your synthesizer or on another MIDI keyboard, a number corresponding to that program is sent out via MIDI as a Program Change message.

You can record Program Change Messages together or independently from the notes, that is, afterwards or before.

You can record Program Change Messages on their own tracks, separately from the notes to which they belong. As long as you set the two tracks to the same output and MIDI channel, it will appear to the MIDI instrument as if you made the two recordings at the same time.

Recording System Exclusive Messages

System Exclusive (SysEx) messages are special types of MIDI messages that are used to send data that only makes sense to a unit of a certain make and type.

SysEx can be used to transmit a list of the numbers that make up the settings of one or more sounds in a synth.

Reset Function

The **Reset** function sends out note-off messages and resets controllers on all MIDI channels. This is sometimes necessary if you experience hanging notes, constant vibrato, etc. when punching in and out on MIDI recordings with pitchbend or controller data.

- To perform a MIDI reset manually, select **MIDI > Reset**.
- If you want Nuendo to perform a MIDI reset on stop, select **File > Preferences > MIDI** and activate **Reset on Stop**.
- If you want Nuendo to insert a reset event at the end of a recorded part, select **File > Preferences > MIDI** and activate **Insert Reset Events after Record**.

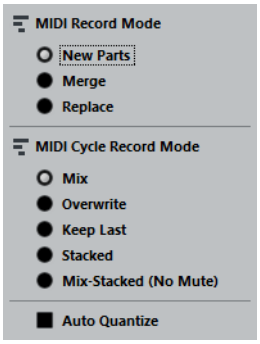
  This resets controller data such as sustain, aftertouch, pitchbend, modulation, and breath control. This is useful if a MIDI part is recorded and the sustain pedal is still held after stopping recording. Usually, this would cause all following parts to be played with sustain, as the pedal off command was not recorded.

RELATED LINKS

MIDI on page 1265

MIDI Record Modes

By selecting a **MIDI Record Mode** you decide what happens to any existing parts on the track where you are recording. MIDI tracks can play back all events in overlapping parts. If you record several parts in the same locations or move parts so that they overlap, you will hear the events in all parts.



- To select a **MIDI Record Mode**, click the MIDI symbol in the left section of the **Transport** panel.
- To close the **MIDI Record Mode** panel again, click anywhere outside the panel.

MIDI Record Mode

New Parts

Existing parts that are overlapped by a new recording are kept. The new recording is saved as a new part.

Merge

Existing events in parts that are overlapped by a new recording are kept. The newly recorded events are added to the existing part.

Replace

Existing events in parts that are overlapped by a new recording are replaced.

MIDI Cycle Record Mode

When you record MIDI in cycle mode, the result not only depends on the MIDI Record Mode, but also on the Cycle Record Mode that is selected in the **MIDI Cycle Record Mode** section.

Mix

For each completed lap, everything you record is added to what was previously recorded. This is useful for building up rhythm patterns. Record a hi-hat part on the first lap, the bass drum part on the second lap, etc.

Overwrite

As soon as you play a MIDI note or send any MIDI message, all MIDI that you have recorded on previous laps is overwritten from that point. Make sure that you stop playing before the next lap begins. Otherwise, you will overwrite the entire take.

Keep Last

Each completed lap replaces the previously recorded lap. If you deactivate recording or press **Stop** before the cursor reaches the right locator, the previous take will be kept. If you do not play or input any MIDI during a lap, nothing happens, and the previous take will be kept.

Stacked

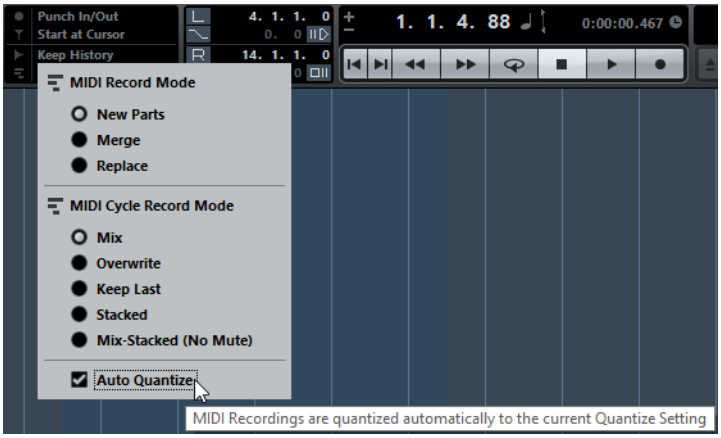
Each recorded cycle lap is turned into a separate MIDI part, and the track is divided into lanes, one for each cycle lap. The parts are stacked above each other, each on a different lane. All takes but the last one are muted.

Mix Stacked

Same as **Stacked**, but parts are not muted.

Quantizing MIDI Recordings

Nuendo can automatically quantize MIDI notes on recording.



- To enable automatic quantizing, open the **Transport** panel and in the **Record Mode** section, activate **Auto Quantize**.

  The notes that you record are automatically quantized according to the Quantize settings.

RELATED LINKS

Quantizing MIDI and Audio on page 261
Common Settings on page 265

Recovering MIDI Recordings

Nuendo allows you to recover MIDI recordings.

Enabling Retrospective Record

The **Retrospective Record** setting allows you to capture any MIDI notes that you play in Stop mode or during playback and turn them into a MIDI part after the fact. This is possible because Nuendo can capture MIDI input in buffer memory, even when not recording.

PROCEDURE

1. Select **File > Preferences > Record–MIDI**.
2. Enable **Retrospective Record** and specify a **Retrospective Record Buffer Size**.
   This activates the buffering of MIDI input.
3. In the MIDI track list, activate the **Record Enable** button.
4. Play some MIDI material either in Stop mode or during playback.
5. Select **Transport > Retrospective Record**.

RESULT

The content of the MIDI buffer is turned into a MIDI part on the record-enabled track, and the captured notes end up exactly where you played them in relation to the project.

RELATED LINKS

Record - MIDI on page 1272

Remaining Record Time

The **Record Time Max** display lets you see how much time you have left for recording.

The available time depends on the current setup, for example, on the amount of tracks that are record-enabled, the sample rate for your project, and the available hard disk space.

- To open the display, select **Devices > Record Time Max**.

NOTE

The remaining record time is also shown in the status line above the track list.

If you use individual record folders to store your tracks on different drives, the time display refers to the medium with the least storage space available.

Lock Record

The **Lock Record** function prevents you from accidentally deactivating the record mode.

- Select **File > Key Commands** and in the **Transport** category, assign key commands to the **Lock Record** and **Unlock Record** commands.

If **Lock Record** is activated and you want to enter Stop mode, a dialog opens in which you need to confirm that you want to stop recording. You can also use the **Unlock Record** key command first and then enter Stop mode as usual.

NOTE

An automatic punch-out at the right locator position will be ignored in **Lock Record** mode.

Quantizing MIDI and Audio

Quantizing means moving recorded audio or MIDI and positioning it on the nearest grid position that is musically relevant. Quantizing is designed to correct errors, but you can also use it in a creative way.

You can quantize audio and MIDI to a grid or to a groove. You can also quantize multiple audio tracks simultaneously.

Audio and MIDI can be quantized at the same time. However, what exactly happens during quantizing differs for audio and MIDI:

- Audio quantizing affects the audio event starts or the content of your audio.
- MIDI quantizing can affect the starts of MIDI events in a part, the MIDI event lengths, or the MIDI event ends.

NOTE

Quantizing is based on the original position of the events. Therefore, you can freely try out different quantize settings without the risk of destroying anything.

The Quantize function is found on the Edit menu. You can also use the key command [Q] or the “Quantize” button on the Quantize Panel.

RELATED LINKS

Quantizing Audio Event Starts on page 261
AudioWarp Quantize on page 262
Quantizing MIDI Event Starts on page 263
Quantizing MIDI Event Lengths on page 263
Quantizing MIDI Event Ends on page 263

Quantizing Audio Event Starts

If you select audio events or a sliced loop and use the Quantize function, the audio events are quantized based on their snap points or event starts.

The snap points that do not match exact note positions on the selected grid are moved to the closest grid positions. The grid is set up on the Quantize pop-up menu. If no snap points are available, the event start is moved.

NOTE

If you use the Quantize function on an audio part, the event starts inside the part are quantized.

AudioWarp Quantize

If you want to quantize the content of your audio event by applying time stretch, use the “AudioWarp Quantize” function. This function quantizes the audio event by aligning the warp markers to the defined quantize grid.

The following happens:

- Warp markers are created at hitpoint positions. If no hitpoints are available, they are automatically created. Furthermore, warp markers are created at every event start and end.
- The audio sections between the warp markers are stretched or compressed to fit into the time interval set up on the “Quantize Presets” pop-up menu.

AudioWarp quantize prevents warp markers from ending up on the same position. If conflicts occur, only one of the warp markers is quantized. For example, if you use a quantize value of 1/4 on audio that is based on sixteenth notes, the warp markers at the quarter-note positions are quantized to the grid, and the remaining warp markers are moved, keeping the relative distances between the warp markers.

You can also apply AudioWarp quantizing to selection ranges in the Project window and in the Sample Editor. To avoid moving transient positions that lie outside the selection range, additional warp markers are created at the closest hitpoint positions outside the range.

RELATED LINKS

Working with hitpoints and slices on page 533

Applying AudioWarp Quantizing

PROCEDURE

1. Select the audio event that you want to quantize.
2. On the toolbar, activate the “AudioWarp Quantize” button, open the “Quantize Presets” pop-up menu, and select a preset to determine the quantize grid.
3. Open the Edit menu, and select Quantize.

   You can also use the Quantize Panel for applying AudioWarp quantizing. The Quantize Panel provides more parameters for defining the quantize grid.

RELATED LINKS

Quantize Panel on page 265

Quantizing MIDI Event Starts

If you select MIDI notes in a part and use the Quantize function on the Edit menu, the MIDI note starts are quantized, that is, the starts of MIDI notes that do not match exact note positions are moved to the closest grid positions. The grid is set up on the Quantize pop-up menu. The note lengths are maintained.

NOTE

If you quantize MIDI parts, all events are quantized, even if none is selected.

Quantizing MIDI Event Lengths

The “Quantize MIDI Event Lengths” function on the Edit menu, Advanced Quantize submenu, quantizes the lengths of MIDI notes without changing their start positions. At its most basic level, this function sets the lengths of the notes to the Length Quantize value on the MIDI editor toolbar by cutting off the note ends.

However, if you have selected the “Quantize Link” option on the “Length Quantize” pop-up menu, the function resizes the notes according to the quantize grid, taking the Swing, Tuplet, and Catch Range settings into account.

Quantizing MIDI Event Ends

The “Quantize MIDI Event Ends” function on the Edit menu, Advanced Quantize submenu, moves the ends of your MIDI notes to the nearest grid positions, taking the Quantize pop-up menu setting into account.

Quantizing Multiple Audio Tracks

You can quantize multiple audio tracks at the same time. To maintain phase coherence, all tracks have to be sliced at exactly the same start and end positions. Only then the resulting slices can be quantized without risk of getting phase errors.

NOTE

For this to work, the audio tracks must reside in the same folder track and the "=" button for Group Editing must be activated. Furthermore, at least one of the tracks must contain hitpoints.

PROCEDURE

1. Create an edit group for the audio tracks that you want to quantize.
2. In the Sample Editor, create hitpoints for at least one of the audio tracks that you want to quantize, and fine-tune the hitpoint detection result with the Threshold slider.
3. Open the Quantize Panel.
4. Set up the parameters in the "Slice Rules" section and click the Slice button.
5. Set up the parameters in the Quantize section and click the Quantize button.
6. Set up the parameters in the Crossfades section and click the Crossfade button to correct for overlaps or gaps in the quantized audio.

AudioWarp Quantizing Multiple Audio Tracks

Instead of slicing the audio events and using the slices for quantizing, you can use warp markers for quantizing multiple audio tracks.

NOTE

Note that AudioWarp quantizing does not maintain phase coherence.

To quantize multiple audio tracks using the AudioWarp quantize function, proceed as follows:

PROCEDURE

1. Create an edit group for the audio tracks that you want to quantize.
2. In the Sample Editor, create hitpoints for at least one of the audio tracks that you want to quantize, and fine-tune the hitpoint detection result with the Threshold slider.
3. Open the Quantize Panel, activate the "AudioWarp Quantize" button, and set up the parameters in the "Warp Marker Creation Rules" section.
4. Click the Create button.
5. Set up the other parameters on the Quantize Panel, and click the Quantize button.

   AudioWarp quantizing is applied to all tracks in the edit group.

RELATED LINKS

Group Editing on page 208

Quantize Panel

The Quantize Panel provides further parameters for defining how to quantize audio or MIDI. These parameters allow you to set up a more sophisticated quantization.

Using the Quantize Panel, you can quantize audio or MIDI to the grid or to a groove. Depending on what method you choose, different parameters are shown on the Quantize Panel. There is also a set of common settings.

You can open the Quantize Panel by clicking the corresponding button on the toolbar or by opening the Edit menu and selecting “Quantize Panel”.

Common Settings

Quantize Presets Pop-Up Menu

On this pop-up menu, you can select a quantize or a groove preset.

Save/Remove Preset

The preset controls allow you to save the current settings as a preset, making them available on all “Quantize Presets” pop-up menus. This includes Swing, “Catch Range”, etc.

- To save a preset, click the “Save Preset” button (the plus sign) to the right of the Quantize Presets pop-up menu.
  A preset name is generated automatically, according to your settings.
- To rename a preset, open the “Quantize Presets” pop-up menu, select “Rename Preset” and enter the new name in the dialog that appears.
- To remove a user preset, select it and click the “Remove Preset” button.

Non-Quantize

This setting allows you to create a safe zone before and after the quantize positions, by specifying a “distance” in ticks (120 ticks = one 16th note). Events that lie within this zone are not quantized. This allows you to keep slight variations when you quantize, but correct notes that are too far away from the grid positions.

Grid Display

In the middle of the Quantize Panel the grid display is shown. The green lines indicate the quantize grid, that is, the positions that audio or MIDI is moved to.

Randomize

This setting allows you to set a distance in ticks, so that your audio or MIDI is quantized to random positions within the specified distance from the quantize grid. This allows for slight variations and, at the same time, prevents your audio or MIDI from ending up too far away from the grid.

MIDI CC

If you activate this button, controllers related to MIDI notes (pitchbend, etc.) are automatically moved with the notes when these are quantized.

Auto Apply

If you activate this button, any changes you make are immediately applied to the selected parts or events. A way of using this feature is to set up a playback loop and adjust the settings until you are satisfied with the result.

iQ Mode and Iterative Strength Setting

If you quantize your audio or MIDI with the “iQ Mode” (iterative quantize) option activated, a “loose” quantization is applied. This means that your audio or MIDI moves only part of the way to the closest quantize grid position. You can specify an “Iterative Strength” value to the right of the “iQ Mode” option. This value determines how close your audio or MIDI moves towards the grid.

NOTE

Iterative quantizing is based on the current, quantized positions and not on the original event positions. This makes it possible to repeatedly use iterative Quantize, gradually moving your audio or MIDI closer to the quantize grid until you have found the right timing.

Reset Quantize

This button is identical with the “Reset Quantize” function on the Edit menu.

IMPORTANT

If you move an audio event manually, the actual event start changes. Therefore, the “Reset Quantize” function has no effect on an event that was moved manually.

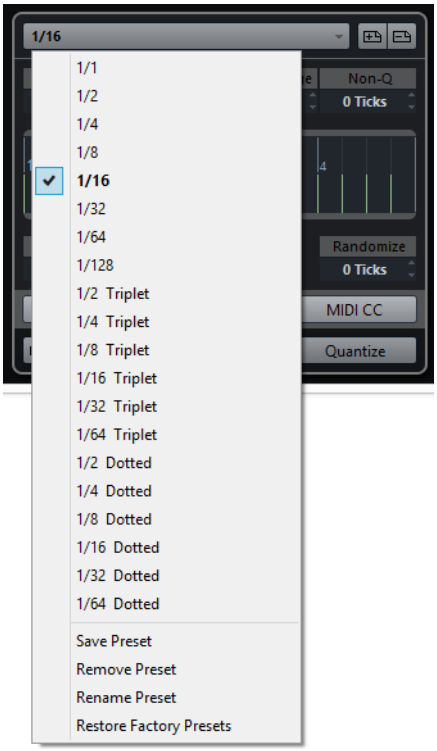
Quantize

Clicking this button applies your settings.

RELATED LINKS

Reset Quantize on page 272

Options For Quantizing to a Musical Grid



Grid

On this pop-up menu you can determine the basic value for the quantize grid.

Swing

This parameter lets you offset every second position in the grid, creating a swing or shuffle feel.

This setting is only available when a straight value is selected for the grid and Tuplet is off (see below).

Catch Range

This parameter allows you to specify that quantizing affects only audio or MIDI within a certain distance from the grid lines, the so-called catch range. This allows for complex quantization tasks, for example, if you want to quantize only the heavy beats near each beat, and not the events in-between.

With a value of 0%, all audio or MIDI is affected by quantizing. With higher percentages, wider catch ranges are shown around the green lines in the grid display.

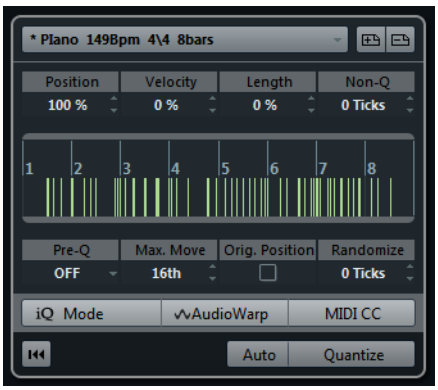
Tuplet

This parameter allows you to create rhythmically more complex grids by dividing the grid into smaller steps, and thereby creating n-tuplets.

Options for Quantizing to a Groove

Groove quantizing is intended for recreating existing rhythmic feels by matching your recorded music to a timing grid generated from a MIDI part or an audio loop.

To extract the groove from a MIDI part, from an audio loop, an audio event with hitpoints, or sliced audio, select the material and drag it onto the grid display in the middle of the Quantize Panel. Alternatively, you can use the “Create Groove Quantize Preset” function.



Position

This parameter lets you determine how much the timing of the groove affects the music. 0% means that the timing of the music remains unaffected, while 100% means that the timing is adjusted to match the groove completely.

Velocity (MIDI Only)

This parameter lets you determine how much the velocity values within the groove affect the music. Note that not all grooves contain velocity information.

Length (MIDI Only)

This parameter lets you specify how much the length of the notes is affected by the groove. This is done by modifying the note-off value.

NOTE

For drums, the Length setting is ignored as drum sounds cannot be sustained.

Pre-Quantize

This pop-up menu lets you quantize your audio or MIDI to a musical grid before groove quantizing. This helps you to get the notes closer to their groove destination.

For example, if you apply a shuffle groove to a 16th-note pattern, you can set up a Pre-Quantize value of 16 to straighten up the timing before applying the groove quantizing.

Max. Move

Here, you can select a note value to specify a maximum distance that the audio or MIDI is moved.

Orig. Position

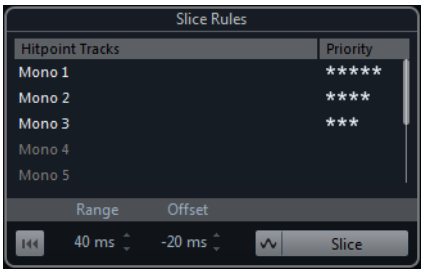
If you activate this option, the starting point of the quantizing operation is not the first bar of the project, but the original starting position of the audio or MIDI material used to find the groove. This allows you to synchronize material that does not start from bar 1 of the project.

RELATED LINKS

Creating Groove Quantize Presets on page 272

Options for Quantizing Multiple Audio Tracks

In the “Slice Rules” section, you determine how the audio events are sliced at the hitpoints.



Hitpoint Tracks

This column lists all audio tracks of your edit group that have hitpoints.

Priority

In this column, you can define a priority for each track. This specifies which hitpoints are used to slice your audio events. The track with the highest priority defines where the audio is sliced. The audio on all tracks is sliced at all hitpoints of this track.

If you set up the same priority for several tracks, the cutting position is defined by the track that contains the first hitpoint within the specified range. This is decided for each cutting position anew.

- Click and drag to the right or to the left to specify a priority.
  If you drag the mouse to the far left so that no star is shown, the hitpoints on the corresponding track are not taken into account.

If the zoom factor is high enough, cutting positions are marked in the Project window by vertical lines:

- The red lines indicate the cutting positions on the main track, that is, on the track whose hitpoint defines the cutting position.
- The black lines indicate the cutting positions on all other tracks.

Range

Two hitpoints on different tracks are considered to mark the same beat if they are located within a certain distance from each other. The Range parameter lets you specify this distance. The following rules apply:

- If one of the tracks has a higher priority, its hitpoint is used as the cutting position.
- If the tracks have the same priority, the first hitpoint in the range is used.

Offset

With this parameter, you can determine an offset, allowing for slight variations of the cutting position. The Offset value determines how far before the actual hitpoint position an audio event is sliced. This is useful if you want to create crossfades at the slice positions. Furthermore, it helps to avoid cutting off signals on tracks that do not contain any hitpoints.

AudioWarp Quantize On/Off

Click this button to activate AudioWarp quantizing. This enables the “Warp Marker Creation Rules” section.

Slice

If you click the Slice button, all audio events of the edit group are sliced at exactly the same positions according to your settings. The event snap points are set to the position of the hitpoint with the highest priority.

Reset

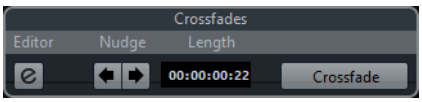
Click this button to undo the slicing and restore the original state of the audio events.

RELATED LINKS

Options for AudioWarp Quantizing Multiple Audio Tracks on page 271
The Crossfades Section on page 270
AudioWarp Quantizing Multiple Audio Tracks on page 264
Group Editing on page 208

The Crossfades Section

The Crossfades section becomes available after you have sliced the audio events. The functions in this section are designed to correct the overlaps or the gaps that might appear due to the re-positioning of your audio.



Clicking the Crossfade button cuts the end of the first event at the start position of the following event (in case of overlaps), and stretches the second event until it starts at the end of the previous event (in case of gaps).

In some cases, you might want to achieve seamless transitions, applying crossfades after closing the gaps. For this purpose, use the following parameters:

Open Crossfade Editor

This opens the Crossfade editor, where you can specify curve kind, length, and other parameters for your crossfades.

Nudge Crossfade Left/Right

Clicking these buttons moves the fade area in the audio event to the left or to the right in steps of one millisecond. This is useful if the Offset value in the section “Slice Rules” was not high enough, and you want to avoid that the crossfade cuts an attack.

Length

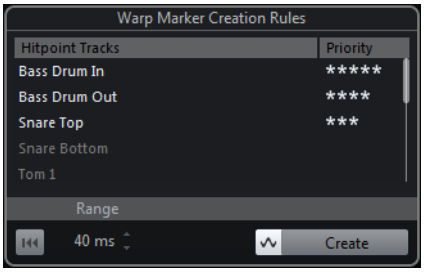
With this parameter you can specify the length of the crossfade area.

RELATED LINKS

The Crossfade dialog on page 281

Options for AudioWarp Quantizing Multiple Audio Tracks

The “Warp Marker Creation Rules” section becomes available when you activate AudioWarp quantizing for multiple audio tracks.



Priority

In this column, you can define a priority for each track. The track with the highest priority defines where the warp markers are created.

If you set up the same priority for several tracks, the warp marker position is defined by the track that contains the first hitpoint within the specified range. This is decided for each warp marker position anew.

- Click and drag the mouse to the right or to the left to specify a priority.
  If you drag the mouse to the far left so that no star is shown, the hitpoints on the corresponding track are not taken into account.

Range

Two hitpoints on different tracks are considered to mark the same beat if they are located within a certain distance from each other. The Range parameter lets you specify this distance. The following rules apply:

- If one of the tracks has a higher priority, its hitpoint is used to create the warp marker.
- If the tracks have the same priority, the first hitpoint in the range is used.

Reset

Click this button to undo the creation of warp markers.

AudioWarp Quantize On/Off

Click this button to deactivate AudioWarp quantizing. This enables the “Slice Rules” section.

Create

If you click the Create button, warp markers are created for all the tracks.

RELATED LINKS

Options for Quantizing Multiple Audio Tracks on page 269
AudioWarp Quantizing Multiple Audio Tracks on page 264
Group Editing on page 208

Additional Quantizing Functions

Freezing MIDI Quantizing

The Freeze MIDI Quantize function on the Edit menu, Advanced Quantize submenu, makes the start and end positions of MIDI events permanent. This is useful in situations where you want to quantize a second time, based on the current quantized positions rather than the original positions.

Reset Quantize

This command on the Edit menu reverts your audio or MIDI to its original, unquantized state. This function is independent from the regular Undo History.

NOTE

The Reset function also resets any length changes that you performed using the “Scale Length/Legato” slider.

RELATED LINKS

Length on page 795

Creating Groove Quantize Presets

You can generate a groove quantize map based on hitpoints that you have created in the Sample Editor.

PROCEDURE

1. Open the Sample Editor for the audio event from which you want to extract the timing.
2. Create and edit hitpoints.

3. On the Hitpoints tab, click the “Create Groove” button.
   The groove is extracted.

Result

If you open the Quantize pop-up menu on the Project window toolbar, you will find an additional item at the bottom of the list, with the same name as the file from which you have extracted the groove. You can select it as a base for quantizing, just like any other quantize value.

After Completing This Task

To save the groove, open the Quantize Panel and save it as a preset.

Related links

Working with hitpoints and slices on page 533
Save/Remove Preset on page 265

Fades, crossfades, and envelopes

Creating fades

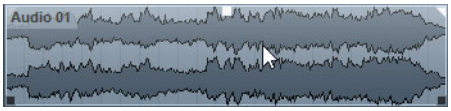
There are two types of fade ins and fade outs in audio events in Nuendo: event-based fades that you create by using the fade handles and clip-based fades created by processing.

RELATED LINKS

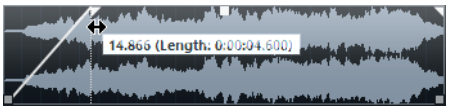
Event-based fades on page 274
Clip-based fades on page 277

Event-based fades

Selected audio events have triangular handles in the upper left and right corners. These can be dragged to create a fade in or fade out, respectively.



The fade handles are visible when you point the mouse at the event.



The fade is automatically reflected in the shape of the event's waveform, giving you a visual feedback of the result when dragging the fade handle.

Fades created with the handles are not applied to the audio clip as such but calculated in realtime during playback. This means that several events referring to the same audio clip can have different fade curves. It also means that having a large number of fades may require more processing power.

- If you select multiple events and drag the fade handles of one of them, the same fade is applied to all selected events.
- A fade can be edited in the Fade dialog, as described on the following pages.

  You open the dialog by double-clicking in the area above the fade curve, or by selecting the event and selecting "Open Fade Editor(s)" from the Audio menu (note that this will open two dialogs if the event has both fade in and fade out curves).

If you adjust the shape of the fade curve in the Fade dialog, this shape will be maintained when you later adjust the length of the fade.

- You can make the fade longer or shorter at any time, by dragging the handle.

  You can do this without selecting the event first, i.e. without visible handles. Just move the mouse pointer along the fade curve until the cursor turns into a bidirectional arrow, then click and drag.

- If the “Show Event Volume Curves Always” option is activated in the Preferences dialog (Event Display–Audio page), fade curves are shown in all events, regardless of whether they are selected or not.

  If the option is deactivated, the fade curves are shown in selected events only.

- If the “Use Mouse Wheel for Event volume and Fades” option is activated in the Preferences dialog (Editing–Audio page), moving the mouse wheel moves the volume curve up or down.

  When you press [Shift] while moving the mouse wheel, and position the mouse pointer somewhere in the left half of the event, the fade in end point is moved. When the mouse pointer is in the right half of the event, the fade out start point is moved.

NOTE

In the Key Commands dialog (Audio category) you can set up key commands for changing the event volume curve and any fade curves.

NOTE

As an alternative to dragging the fade handles, you can use the “Fade In to Cursor” and “Fade Out to Cursor” options on the Audio menu to create fades. Position the project cursor on an audio event where you want a fade in to end or a fade out to begin, and select the appropriate option from the Audio menu. A fade will then be created, ranging from the event’s start or end to the position of the cursor.

RELATED LINKS

Key Commands on page 1168

Creating and adjusting fades with the Range Selection tool

Event-based fades can also be created and adjusted with the Range Selection tool.

PROCEDURE

1. Select a section of the audio event with the Range Selection tool.

2. Open the Audio menu and select “Adjust Fades to Range”.

   The result depends on your selection:

   - If you select a range from the beginning of the event, a fade in is created within the range.
   - If you select a range that reaches the end of an event, a fade out is created in the range.

- If you select a range encompassing a middle section of the event, but not reaching neither the start nor the end, a fade in is created from the beginning of the event to the beginning of the selected range, and a fade out is created from the end of the selected range to the end of the event.

IMPORTANT

You can select multiple audio events on separate tracks with the Range Selection tool, and apply the fade to all of them simultaneously.

Applying default fades

You can also create fades by using the “Apply Standard Fade In” and “Apply Standard Fade Out” commands from the Audio menu.

PROCEDURE

1. Select one or more audio events in the Project window.
2. On the Audio menu, select “Apply Standard Fade In” or “Apply Standard Fade Out”.

   A fade of the same length and shape as the default fade is created.

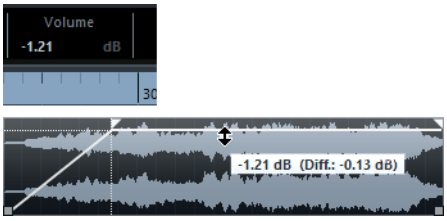
RELATED LINKS

As Default button on page 279

About the volume handle

A selected audio event also has a square handle in the top middle: the volume handle. It provides a quick way of changing the volume of an event in the Project window. Note that dragging the volume handle also changes the value on the info line.

The volume change is displayed numerically on the info line.



The event waveform reflects the volume change.

- Drag the Volume handle up or down to change the volume of the event.

Removing fades

- To remove the fades for an event, select the event and select “Remove Fades” from the Audio menu.
- If you want to remove the fades in a specific range only, select the fade area with the Range Selection tool and select “Remove Fades” from the Audio menu.

Clip-based fades

If you have selected an audio event or a section of an audio event (using the Range Selection tool), you can apply a fade in or fade out to the selection by using the “Fade In” or “Fade Out” function on the Process submenu of the Audio menu. These functions open the corresponding Fade dialog, allowing you to specify a fade curve. Fades created this way are applied to the audio clip rather than to the event.

IMPORTANT

The length of the fade area is determined by your selection. In other words, you specify the length of the fade before you open the Fade dialog. You can select multiple events and apply the same processing to all of them simultaneously.

- If you later create new events that refer to the same clip, these will have the same fades.
- You can remove or modify the fades at any time using the Offline Process History.

If other events refer to the same audio clip, you will be asked whether you want the processing to be applied to these events or not.

- Continue will apply the processing to all events that refer to the audio clip.
- New Version will create a separate, new version of the audio clip for the selected event.
- You can also activate the “Please, don’t ask again” option. Regardless of whether you then choose “Continue” or “New Version”, any further processing will conform to the option you select.

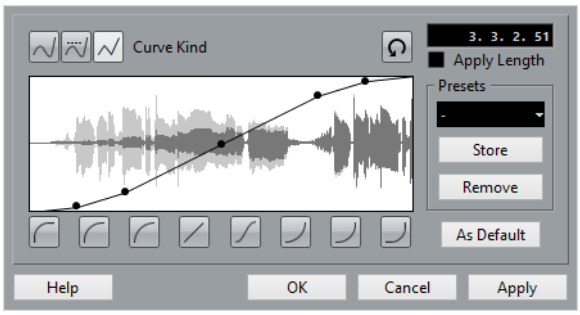
  You can change this setting at any time in the Preferences dialog (Editing–Audio page), under “On Processing Shared Clips”.

RELATED LINKS

The Offline Process History dialog on page 489

The Fade dialogs

The Fade dialogs appear when you edit an existing fade or use the Fade In/Fade Out functions on the Process submenu of the Audio menu. The picture below shows the Fade In dialog; the Fade Out dialog has identical settings and features.



If you open the Fade dialog(s) with several events selected, you can adjust the fade curves for all these events at the same time. This is useful if you want to apply the same type of fade in to more than one event, etc.

The available options are:

Curve Kind

These buttons determine whether the fade curve consists of spline curve segments (left button), damped spline segments (middle button), or linear segments (right button).

Fade display

This shows the shape of the fade curve. The resulting waveform shape is shown in dark gray, with the current waveform shape in light gray.

Click on the curve to add points, and click and drag existing points to change the shape. To remove a point from the curve, drag it outside the display.

Curve shape buttons

These buttons give you quick access to some common curve shapes.

Restore button

This button is only available when editing fades made by dragging the fade handles. Click this to cancel any changes you have made since opening the dialog.

Fade Length Value

This parameter is only available when editing fades made by dragging the fade handles. It can be used to enter fade lengths numerically. The format of values displayed here is determined by the Time Display in the Transport panel.

- When you activate the Apply Length option, the value entered in the Fade Length value field is used when clicking Apply or OK.
- When you set the current fade as the default fade, the length value is included as part of the default settings.

Presets

In this section you can set up presets for fade in or fade out curves that you want to apply to other events or clips.

- To apply a stored preset, select it from the pop-up menu.
- To rename the selected preset, double-click on the name and type in a new one.
- To remove a stored preset, select it from the pop-up menu and click Remove.

As Default button

This button is only available when editing fades made by dragging the fade handles. Click this to save the current settings as the default fade, to be used whenever you create new fades by dragging event handles.

Both the shape and length will be used when you create fades using the “Apply Standard Fade…” command from the Audio menu.

Applying a fade

Depending on whether you are editing a fade made with the fade handles or applying a fade using processing, different buttons are shown in the bottom row of the Fade dialog.

The Edit Fade dialogs have the following buttons:

OK

Applies the set fade curve to the event, and closes the dialog.

Cancel

Closes the dialog without applying any fade.

Apply

Applies the set fade curve to the event, without closing the dialog.

The Process Fade dialogs have the following buttons:

Preview

Plays back the fade area. Playback will repeat until you click the button again (the button is labeled “Stop” during playback).

Process

Applies the set fade curve to the clip, and closes the dialog.

Cancel

Closes the dialog without applying any fade.

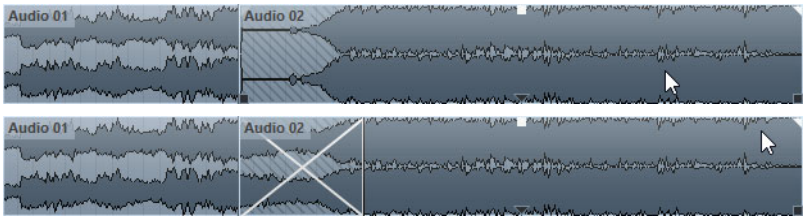
Creating crossfades

Overlapping audio material on the same track can be crossfaded, for smooth transitions or special effects. You create a crossfade by selecting two consecutive audio events and selecting the Crossfade command on the Audio menu (or by using the corresponding key command, by default [X]).

The result depends on whether the two events overlap or not:

- If the events overlap, a crossfade is created in the overlapping area.

  The crossfade will be of the default shape (linear, symmetric), but you can change this as described below.



Crossfade area

NOTE

The default crossfade length and shape are set in the Crossfade dialog.

- If the events do not overlap but are directly consecutive (lined up end-to-start, with no gap) it is still possible to crossfade them – provided that their respective audio clips overlap! In this case, the two events are resized so that they overlap, and a crossfade of the default length and shape is applied.
- If the events do not overlap and cannot be resized enough to overlap, a crossfade cannot be created.
- You can specify the length of the crossfade using the Range Selection tool: make a selection range covering the desired crossfade area and use the Crossfade command on the Audio menu.

  The crossfade is applied to the selected range (provided that the events or their clips overlap, as described above).

  NOTE

  You can also make a selection range after creating the crossfade and use the function “Adjust fades to Range” on the Audio menu.

- Once you have created a crossfade, you can edit it by selecting one or both crossfaded events, and selecting “Crossfade” from the Audio menu again (or by double-clicking in the crossfade zone).

  This opens the Crossfade dialog.

RELATED LINKS

The Crossfade dialog on page 281

Removing crossfades

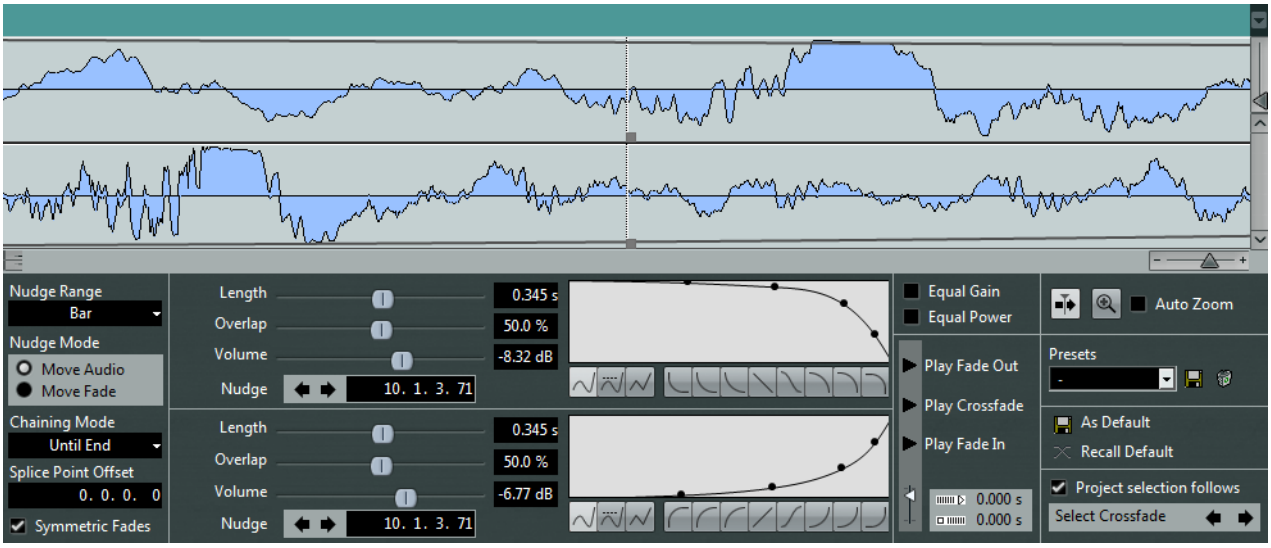
To remove a crossfade, proceed as follows:

- Select the corresponding events and select “Remove Fades” from the Audio menu.
- Use the Range Selection tool to select all fades and crossfades you wish to remove, and select “Remove Fades” from the Audio menu.
- Select a crossfade by clicking, and drag it outside the track.

The Crossfade dialog

NOTE

This section describes the default Crossfade dialog. However, if you activate the “Simple Crossfade Editor” option in the Preferences dialog (Editing–Audio page), a simplified dialog is used instead (similar to the regular Fade dialogs).



The Crossfade dialog consists of two sections: The waveforms of the audio to be crossfaded and the fade curves are displayed at the top. The lower half of the Crossfade dialog contains a number of common settings and controls, as well as separate (but identical) settings for the fade out (top) and the fade in curve (bottom) of the crossfade. The following options are available (from left to right):

Nudge Range

This pop-up menu lets you specify the range that is moved when using the Nudge buttons.

Nudge Mode

Here, you can specify whether you want the fade or the audio to move when you use the Nudge buttons.

Chaining Mode

This setting determines how the audio to the right of the crossfade on the track behaves when you move the crossfade for an event. Note that the behavior is different depending on whether the next audio event on the track follows seamlessly or with a gap:

- Until End – all following events on the track are moved.
- Until Gap – all following events on the track up to the next gap are moved.
- None – none of the following events on the track are moved.

Splice Point Offset

In the fade in and fade out curves you can see a dotted vertical line that marks the splice point. If you work with asymmetric crossfades, you can set different splice points for the fade in and the fade out events, i.e. a splice point offset.

Symmetric Fades

If this is activated, the editing controls of the fade out and fade in curves become “linked”, so that both fade curves are affected by the same amount, regardless of whether you use the fade out or fade in controls.

Length

This specifies the length of the crossfade area.

Overlap

This defines the position of the splice point in the crossfade area.

Volume

This changes the volume of the crossfaded events. This is the same as using the volume handles in the event display.

Nudge buttons

Use the Nudge buttons to nudge the fade area or the audio in the desired direction.

Fade curve displays

These displays show the shape of the fade out and fade in curve, respectively. Click on a curve to add points, click and drag existing points to change their shape, or drag a point outside the display to remove it.

Curve buttons

The curve kind buttons determine whether the corresponding fade curve consists of spline curve segments (left button), damped spline segments (middle button) or linear segments (right button).

The curve shape buttons give you quick access to some common curve shapes.

Equal Gain

Activate this parameter to adjust the fade curves so that the summed fade in and fade out amplitudes will be the same all along the crossfade region. This is often suitable for short crossfades.

Equal Power

Activate this parameter to adjust the fade curves so that the energy (power) of the crossfade will be constant all along the crossfade region.

Equal Power curves have only one editable curve point. You cannot use the Curve kind buttons or the presets when this mode is selected.

Play buttons

These buttons allow you to audition the whole crossfade, or the fade out part, or the fade in part. You can set up key commands for this in the following categories of the Key Commands dialog:

- Crossfade Editor category – Play Fade Out, Play Crossfade, Play Fade In.
- Media category – Preview Start (triggers crossfade playback), Preview Stop (stops crossfade playback).
- Transport category – StartStop (triggers global playback), Stop (stops global playback) and StartStop Preview (triggers crossfade playback).

Pre-roll and Post-roll

Activate pre-roll to start playback before the fade area. Activate post-roll to stop playback after the fade area.

In the time fields you can enter the desired time (in seconds and milliseconds) for the pre-roll and post-roll length.

Auto-Scroll button

Activate this to scroll the crossfade display during playback, so that the position cursor is always visible. This only applies when using the Transport play controls and works like the corresponding function in the Project window.

Zoom to Fade button

Click on this button to zoom and center the display on the currently selected crossfade area.

Auto Zoom

Activate this to zoom and center the display automatically on the current crossfade when you resize it. This also works when you select the next crossfade with the “Select Crossfade” buttons (see below).

Presets section

Click the Store button to the right of the Presets pop-up menu to store the settings of your crossfade so that you can apply them to other events later.

- To rename a preset, double-click on the name and type in a new one.
- To remove a preset, select it on the pop-up menu and click the Delete button.

Default buttons

Click the As Default button to store the current settings as default. These settings will then be used whenever you create new crossfades.

Click the Recall Default button to apply the curves and settings of the default crossfade to the Crossfade dialog.

Select Crossfade buttons

These buttons allow you to select the previous/next crossfade area, provided that the current track contains more than one crossfade.

If “Project selection follows” is activated, selecting another crossfade will automatically change the event selection in the Project window.

RELATED LINKS

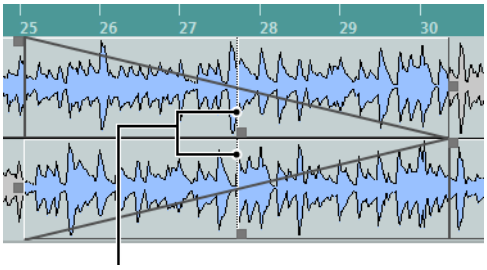
Using the Nudge buttons on page 285
Changing the overlap on page 284
Resizing the crossfade area on page 286
About the volume handle on page 276
Key Commands on page 1168
Auto-Scroll on page 228

Moving the crossfade area

You can move the crossfade area in the crossfade display by changing the overlap or the nudge parameters. This is described in the following sections.

Changing the overlap

The overlap value is the relation between the splice point (i.e. the intersection point of the two events, see the picture below) and the crossfade area. If you use the Overlap controls, the crossfade will be moved around the splice point. By default, the splice point is situated in the center of the crossfade area.



Splice points in a centered symmetric crossfade

For symmetric crossfades, the splice point for the fade out and the fade in is initially situated in the center of the crossfade. By moving the overlap sliders, you can move the crossfade around the splice point to determine how much of the fade out and how much of the fade in event are included.

For asymmetric crossfades you can move the overlap sliders separately to set up different overlap values for the fade in and fade out curves. This results in a Splice Point Offset.

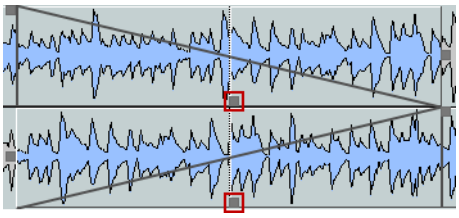
IMPORTANT

Do not mistake the Overlap parameter for the length of the crossfade area of the events.

Using the Nudge buttons

When you use the Nudge buttons, you can decide whether they move the fade area or the audio clip. To do this, activate either “Move Audio” or “Move Fade” in the Nudge Mode section. Each time you click a Nudge button or change the value in the nudge field, the fade area or audio clip is moved in the corresponding direction by the amount specified on the Nudge Range pop-up menu.

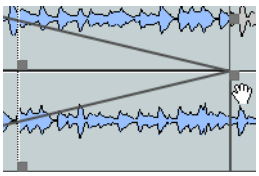
- If “Symmetric Fades” is activated and the Nudge Mode is set to “Move Fade”, both the fade out area and the fade in area will be moved by the same amount. You can also move the fade by using the middle handle of the fade out or the fade in curve.

  Moving the Fade

- If “Symmetric Fades” is activated and the Nudge Mode is set to “Move Audio”, the Nudge buttons in the fade in display will move the audio event.

  You can also move the audio by clicking on the fade in event and dragging with the hand symbol that appears.

  Moving the audio

NOTE

It is not possible to move the audio of the fade out event.

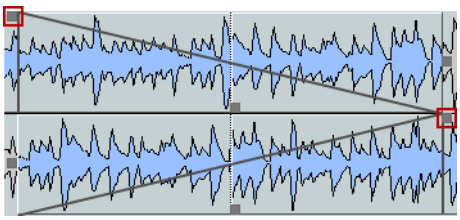
Resizing the crossfade area

IMPORTANT

To be able to resize a crossfade, it must be possible to resize the corresponding event. For example, if the fade out event already plays its audio clip to the end, its end point cannot be moved any further to the right.

Changing the crossfade length without moving the splice points

You can adjust the length of the crossfade area by using the Length sliders, by clicking in the “Length” fields, by changing the value numerically and pressing [Return], or by moving the corresponding handles in the crossfade display:



Click and drag these points to change the length of the fade out or the fade in curve.

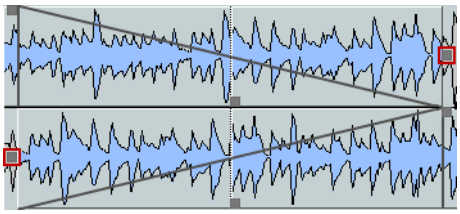
- If “Symmetric Fades” is activated when you change the length, both the fade out and the fade in length are changed by the same amount.

  The length change will be applied equally to both sides, without moving the splice points.

- If “Symmetric Fades” is deactivated, the upper Length controls change the length of the fade out curve, and the lower controls change the length of the fade in curve.

Changing the crossfade length and moving the splice points

You can also adjust the length of the crossfade area by using the right handle of the fade out or the left handle of the fade in curve. This will change the length together with the splice points:



Click and drag these handles to change the length of the fade out or the fade in curve together with the splice points.

- If “Symmetric Fades” is activated, the length and splice points of both the fade out curve and the fade in curve are changed.

- If “Symmetric Fades” is deactivated, the right handle of the fade out curve changes the length and splice point of the fade out curve, and the left handle of the fade in curve changes the length and splice point of the fade in curve.

Auto fades and crossfades

Nuendo features an Auto Fade function that can be set both globally, and separately for each audio track. The idea behind the Auto Fade function is to create smoother transitions between events by applying short (1 to 500 ms) fade ins and fade outs.

IMPORTANT

As event-based fades are calculated in realtime during playback, a higher number of audio events provokes to a higher the demand on the processor when Auto Fades is activated.

NOTE

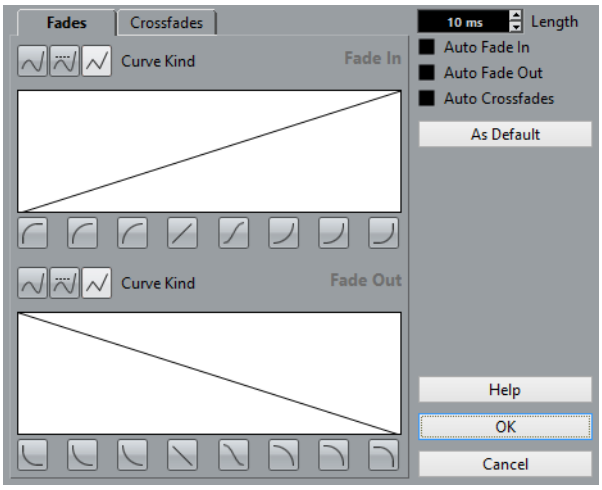
Auto fades are not indicated by fade lines!

Making global Auto Fade settings

PROCEDURE

1. To make Auto Fades settings globally for a project, select “Auto Fades Settings…” from the Project menu.

   This opens the Auto Fades dialog for the project.



2. Use the Length value field to specify the length of the Auto Fades or Crossfades (1 to 500 ms).
3. Use the checkboxes in the upper right corner to activate or deactivate Auto Fade In, Auto Fade Out, and Auto Crossfades.
4. To adjust the shapes of Auto Fade In and Auto Fade Out, select the Fades tab and make settings as in the regular Fade dialogs.

5. To adjust the shape of the Auto Crossfade, select the “Crossfades” tab and make settings as in the regular Crossfade dialog.
6. If you want to use your settings in future projects, click the “As Default” button.
7. Click OK to close the dialog.

RELATED LINKS

The Fade dialogs on page 278
The Crossfade dialog on page 281

Making Auto Fade settings for individual tracks

By default, all audio tracks will use the settings you have made in the project’s Auto Fades dialog.

However, since Auto Fades use computing power, a better approach may be to turn Auto Fades off globally and activate them for individual tracks, as needed:

PROCEDURE

1. Right-click the track in the track list and select “Auto Fades Settings…” from the context menu (or select the track and click the “Auto Fades Settings” button in the Inspector).

   The Auto Fades dialog for the track opens. This is identical to the project’s Auto Fades dialog, with the addition of a “Use Project Settings” option.
2. Deactivate the “Use Project Settings” option.

   Any settings you now make are applied to the track only.
3. Set up the Auto Fades as desired and close the dialog.

Reverting to project settings

If you want a track with individual Auto Fade settings to use the global Auto Fade settings, open the Auto Fades dialog for the track and activate the “Use Project Settings” checkbox.

Event envelopes

An envelope is a volume curve for an audio event. It is similar to the realtime fades, but allows you to create volume changes within the event, not only at the start or end.

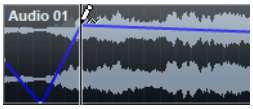
To create an envelope for an audio event, proceed as follows:

PROCEDURE

1. Zoom in on the event so that you can view its waveform properly.
2. Select the Draw tool.

   When you move the Draw tool over an audio event, a small volume curve symbol is shown next to the tool.
3. To add an envelope point, click in the event with the Draw tool.

   An envelope curve and a curve point appear.

4. Drag the curve point to adjust the envelope shape.

   The waveform image reflects the volume curve.

   - You can add as many curve points as you like.
   - To remove a curve point from the envelope, click on it and drag it outside the event.
   - To remove an event envelope curve from a selected event, open the Audio menu and select the Remove Volume Curve option.
   - The envelope curve is a part of the audio event – it will follow when you move or copy the event.

     After copying an event with an envelope, you can make independent adjustments to the envelopes in the original event and the copy.

   NOTE

   It is also possible to apply an envelope to the audio clip using the Envelope function on the Process submenu of the Audio menu.

RELATED LINKS

Envelope on page 474

Arranger Track

Introduction

The arranger track allows you to work with sections of your project in a non-linear fashion, to simplify arranging to the maximum extent. Instead of moving, copying and pasting events in the Project window to create a linear project, you can define how different sections are to be played back, like a playlist.

For this, you can define arranger events, order them in a list, and add repeats as desired. This offers a different and more pattern-oriented way of working, which complements the usual linear editing methods in the Project window.

You can create several arranger chains, making it possible to save different versions of a song within the project without sacrificing the original version. When you have created an arranger chain that you like, you have the option of “flattening” the list, which creates a normal linear project based on the arranger chain.

You can also use the arranger track for live performances on the stage, in clubs or at parties.

Setting up the arranger track

Let’s say you have prepared a number of audio files that form the base of a typical pop song, with introduction, verse, chorus and bridge. Now you want to arrange these files.

The first step is to create an arranger track. On the arranger track, you define specific sections of the project by creating arranger events. These can be of any length, may overlap and are not bound to the start or end of existing events and parts. Proceed as follows:

PROCEDURE

1. Open the project for which you want to create arranger events.
2. Open the Project menu and select Arranger from the Add Track submenu (or right-click the track list and select the corresponding option from the context menu).

   An arranger track is added. There can be only one arranger track in a project, but you can set up more than one arranger chain for this track.

3. On the Project window toolbar, make sure that Snap is activated and that the Snap Type is set to a mode that allows your arranger events to snap to appropriate positions in the project.

Snap to events is activated, i.e. when drawing in the Project window, new events will snap to existing events.

4. On the arranger track, use the Draw tool to draw an event of the desired length.

An arranger event is added, called “A” by default. Any following events will be named in alphabetical order.

You can rename an arranger event by selecting it and changing its name in the Project window info line or by holding down [Alt]/[Option], double-clicking on the name in the arranger chain (see below) and entering a new name.

You may want to name your arranger events according to the structure of your project, e.g. Verse, Chorus, etc.

5. Create as many events as you need for your project.

When arranger events have been created, the music sequence is determined by the arranger events.

Events can be moved, resized and deleted using the standard techniques. Please note:

- If you want to change the length of an event, select the Object Selection tool and click and drag the lower corners of the event in the desired direction.
- If you copy an arranger event (by [Alt]/[Option]-dragging or by using copy/paste), a new event will be created with the same name as the original.

  However, this new event will be totally independent from the original event.
- Double-clicking on an arranger event adds it to the current arranger chain.

RELATED LINKS

Managing arranger chains on page 294

Working with arranger events

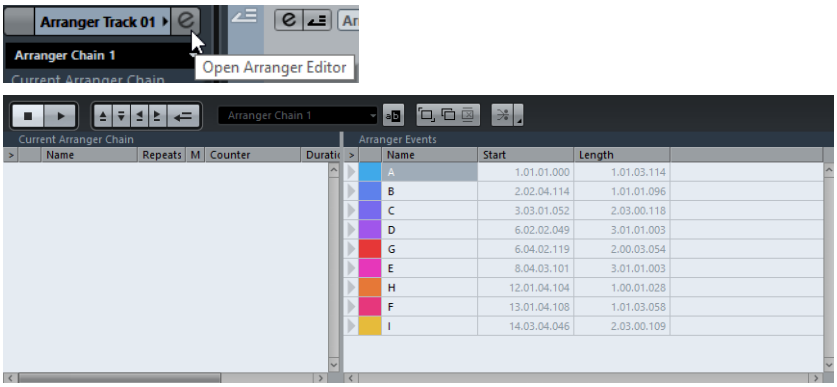
You now have a number of arranger events that form the basic building blocks for your arrangement. The next step is to arrange these events using the functions of the Arranger Editor.

Creating an arranger chain

You can set up an arranger chain in the Arranger Editor or in the Inspector for the arranger track. The Arranger Editor is opened by clicking the “e” button in the Inspector or in the track list.

PROCEDURE

1. Click the “e” button to open the Arranger Editor.



On the right in the Arranger Editor, the available arranger events are listed, in the order they appear on the timeline. To the left you find the actual arranger chain, which shows in which order the events will be played back, from top to bottom, and how many times they are repeated.

Initially the arranger chain is empty – you set it up by adding events from the list to the chain. There are several ways to add events to the arranger chain:

- By double-clicking on the name of an event in the window section on the right (or in the Project window).

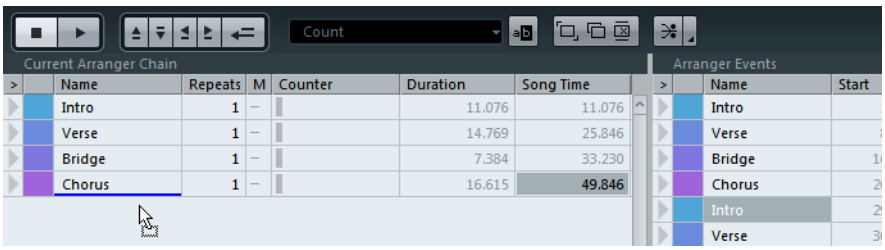
  When an event is selected in the arranger chain on the left, this will add the event above the selected event. When no events are selected in the arranger chain, the event will be added at the end of the list.

- By selecting one or more events in the list, right-clicking and selecting “Append Selected In Arranger Chain”.

  This will add the selected events at the end of the list.

- By dragging and dropping arranger events from the list on the right to the arranger chain on the left.

  A blue insertion line shows you where the dragged event will end up.



An event is dragged into the arranger chain.

- By dragging arranger events from the Project window into the arranger chain.

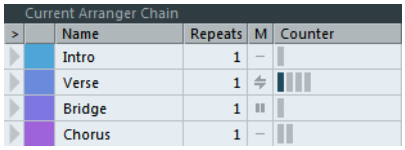
If you followed our example, you should now have arranger events arranged in a very basic pop song pattern. However, we have used audio files that are only a few bars

long – to turn our pattern into a “song” (or at least into a basic sketch of the song structure), these files must be looped. This is where the Repeats function comes in.

If you want an event to repeat several times, proceed as follows:

- Click in the Repeats field for an event, type in the desired number of repeats and press [Enter].

  When playing back the arranger chain, the Counter column indicates which repeat of this event is currently playing.

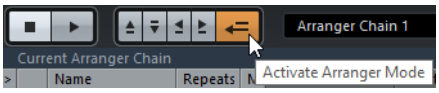


- Click in the Mode field for an event and select the desired repeat mode.

  When you now play back the arranger chain, you will hear the complete arrangement.

2. Make sure that Arranger mode is activated.

   In Arranger mode the project will be played back using the arranger settings.



3. Position the Arranger Editor window so that you can see the arranger track in the Project window, and click in the arrow column for the event at the top of the list.

   You will see the project cursor jump to the beginning of the first event specified in the arranger chain.

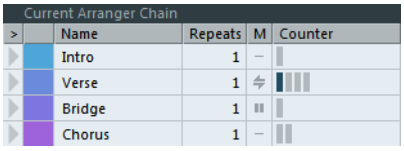
4. Activate playback, either from the Arranger Editor or on the Transport panel.

   The events are played back in the specified order.

RELATED LINKS

Arranger Chain Repeat Modes on page 293

Arranger Chain Repeat Modes



Option	Button	Description
Normal		In this mode, the arranger chain will be played back as you set it up.
Repeat forever		In this mode, the current arranger event will be repeated in a loop until you either click on another event in the Arranger Editor or press play once again.
Pause after Repeats		In this mode, the playback of the arranger chain will be stopped after having played back all repeats of the current arranger event.

Editing the arranger chain

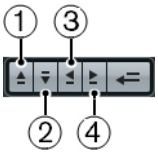
In the arranger chain on the left, you can do the following:

- Select multiple events by [Ctrl]/[Command]-clicking or [Shift]-clicking as usual.
- Drag events to move them in the list.
- Drag events holding [Alt]/[Option] to create copies of the selected items.

  The insert location for both move and copy operations is indicated by a colored insertion line. A blue line indicates that the move or copy is possible; a red line indicates that moving or copying events to the current position is not allowed.
- Use the Repeats column to specify how many times each event is to be repeated.
- Click the arrow to the left of an event in the arranger chain to move the playback position to the start of that event.
- To remove an event from the list, right-click on it and select “Remove Touched” from the context menu. To remove several events, select them, right-click and select “Remove Selected”.

Navigating

To navigate between arranger events, you use the arranger transport buttons.



1) Previous chain step
2) Next chain step
3) First repeat of current chain step
4) Last repeat of current chain step

These controls are available in the Arranger Editor, on the Project window toolbar, and on the Transport panel.

In the Arranger Editor, the event that is currently played back is indicated by an arrow in the leftmost column, and the indicators in the Counter column.

Managing arranger chains

You can create several arranger chains. This way, you can create alternative versions for playback.

In the Arranger Editor, the toolbar buttons on the right are used for this:

Click this to rename the current arranger chain.

Creates a new, empty arranger chain.

Creates a duplicate of the current arranger chain, containing the same events.

Removes the currently selected arranger chain. Only available if you have created more than one arranger chain.

In the Inspector, these functions are accessed from the Arranger pop-up menu (opened by clicking on the Arranger name field).

The arranger chains you create will be listed on the Name pop-up menu, found in the Arranger Editor to the left of the buttons, at the top of the arranger track Inspector, and in the track list. Please note that to be able to select another arranger chain from the pop-up menu, the Arranger mode must be activated.

Flattening the arranger chain

When you have found an arranger chain that suits your purposes, you can “flatten” it, i.e. convert the list into a linear project.

PROCEDURE

1. Click the Flatten button (or select Flatten Chain from the pop-up menu in the Inspector for the arranger track).

   The events and parts in the project are reordered, repeated, resized, moved and/or deleted (if these are not within the boundaries of any used arranger event), so that they correspond exactly to the arranger chain.

   
   The Flatten button

2. Activate Playback.

   The project will now play back exactly as in Arranger mode, but you can view it and work with it as usual.

   IMPORTANT

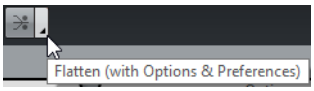
   Flattening the arranger chain may remove events and parts from the project. Only use the Flatten function when you know you do not want to edit the arranger track/chain any more. If in doubt, save a copy of the project before flattening the arranger chain.

Flattening options

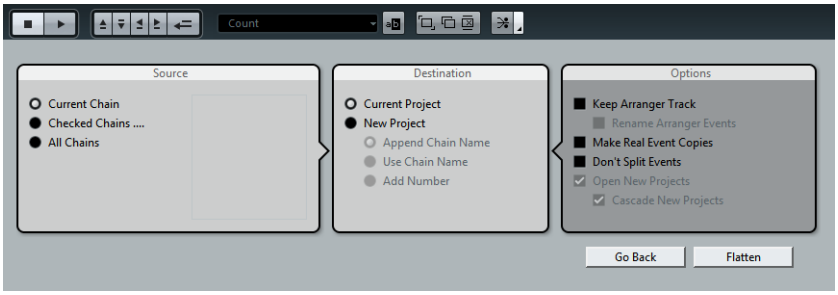
Sometimes it might be useful to keep the original arranger events even after flattening the arranger track. By using flattening options you can define which chain is flattened, where it is stored and how it is named together with other options.

PROCEDURE

1. Click the Flattening options button.



2. In the window that opens, select the desired options.



3. You can now flatten the arranger track by clicking the Flatten button.

   If you realize that you want to do further arrangements, you can click the “Go Back” button and make your adjustments. Your Flattening settings will be kept.

4. Click the “Go Back” button to go back to the Arranger Editor or close the window by clicking its Close button.

Flattening options in the Arranger Editor dialog

In the Source section you can specify which arranger chains are flattened.

Current Chain

If you activate this option, only the current chain will be flattened.

Checked Chains…

If you activate this option, you can select the arranger chains you want to flatten in the list to the left.

All Chains

If you activate this option, all arranger chains of the current project will be flattened.

The Destination section allows you to choose where the result of the flattening is saved. The available options are:

Current Project

This is only available if you have selected “Current Chain” as Source. If you activate this option, the result of the flattening of the current chain will be saved in the current project.

New Project

If you activate this option, you can flatten one or several chains in a new project. In this case it might be useful to use naming options. If you activate “Append Chain Name”, the Chain Names will be appended in brackets to the project name. If you activate “Use Chain Name”, the new projects will have the name of the current arranger chains. If you activate “Add Number”, the new projects will be named like the old ones and a number will be appended in brackets.

In the Options section you can make further settings. The available options are:

Keep Arranger Track

If you activate this option, the arranger track will be kept when flattening the arranger chain. Activate “Rename Arranger Events” to append a number to the events, according to their use. For example, if you use arranger event “A” two times, the first occurrence will be renamed “A 1” and the second “A 2”.

Make Real Event Copies

Normally, you will get shared copies when flattening the arranger track. If you activate this option, real copies will be created instead.

Don’t Split Events

If this option is activated, MIDI notes that start before or are longer than the arranger event will not be included. Only MIDI notes that begin and end inside the arranger event boundaries will be taken into account.

Open New Projects

If you activate this option, a new project will be created for every flattened arranger chain. If you activate the “Cascade New Projects” option the opened projects will be cascaded.

Live mode

If you have set up an arranger track and play it back, you have also the possibility to influence the playback order “live”. Note that the Arranger mode has to be activated to be able to use the Live mode.

PROCEDURE

1. Set up an arranger chain in the Inspector or in the Arranger Editor for an arranger track, activate the Arranger mode and play back your project.

   Now you can use your arranger events listed in the lower section of the Inspector to play back your project in Live mode.

2. Switch into Live mode by clicking on the little arrow in the lower list of the Inspector to the left of the arranger event you want to trigger.

   The arranger event will be looped endlessly, until you click on another arranger event. This might be useful, for example, if you want to loop a guitar solo with a flexible length.

   In the Jump Mode pop-up menu, you can define how long the active arranger event will be played, before jumping to the next one.

   - You can stop Live mode by clicking the Stop button or go back to “normal” playback in Arranger mode by clicking on any arranger event in the upper list.

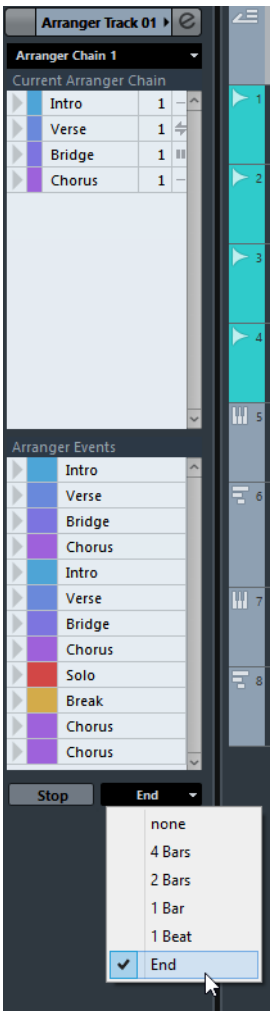
     In the latter case, playback will be continued from the arranger event where you clicked.

RELATED LINKS

Jump Mode options on page 298

Jump Mode options

In the Jump Mode pop-up menu, you can define how long the active arranger event will be played, before jumping to the next one.



The following options are available:

None

Jumps to the next section immediately.

4 bars, 2 bars

When one of these modes is selected, a grid of 4 or 2 bars (depending on the setting) will be placed on the active arranger event. Whenever the respective grid line is reached, playback will jump to the next arranger event. An example:

Let's say you have an arranger event which is 8 bars long and the grid is set to 4 bars. When the cursor is anywhere within the first 4 bars of the arranger event when you hit the next arranger event, playback will jump to the next event when the end of the fourth bar of the arranger event is reached. When the cursor is anywhere within the last 4 bars of the arranger event, playback will jump to the next event at the end of the event.

When an event is shorter than 4 (or 2) bars and this mode is selected, playback will jump to the next section at the event end.

1 bar

Jumps to the next section at the next bar line.

1 beat

Jumps to the next section at the next beat.

End

Plays the current section to the end, then jumps to the next section.

You can stop Live mode by clicking the Stop button or go back to "normal" playback in Arranger mode by clicking on any arranger event in the upper list.

In the latter case, playback will be continued from the arranger event where you clicked.

Arranging your music to video

The relative time of your arranger track can be taken as a reference instead of the project time. This is useful, if you want to use the arranger track to compose music for video and fill a specific video section with music, by repeating the corresponding number of arranger events.

If you position your external sync master device to a position that does not match the Project Start time, Nuendo will jump automatically to the right position in the arranger track and will start playback from there, i.e. the correct relative position and not the absolute project time will be found. The reference for the external timecode can be MIDI or any other timecode that can be interpreted/read by Nuendo.

An example:

PROCEDURE

1. Set up a project with a MIDI track and three MIDI parts. The first part should start at position 00:00:00:00 and end at position 00:01:00:00, the second should start at position 00:01:00:00 and end at position 00:02:00:00 and the third should start at position 00:02:00:00 and end at position 00:03:00:00.
2. Activate the Sync button on the Transport panel.
3. Add an arranger track and create arranger events that match the MIDI parts.
4. Set up the arranger chain “A-A-B-B-C-C”, activate the Arranger mode and play back your project.
5. Start external timecode at position 00:00:10:00 (within the range of “A”).

   In your project, the position 00:00:10:00 will be located and you will hear “A” playing. Nothing special!

   Now, let’s see what happens if your external sync master device starts at a position that does not match the Project Start time:
6. Start at 00:01:10:00 (within the range of what originally was “B”).

   In your project, the position 00:01:10:00 will be located and you will hear “A” playing, because it plays twice in the arranger track.
7. Start external timecode at position 00:02:10:00 (within the range of what originally was “C”).

   In your project, the position 00:02:10:00 will be located and you will hear “B” playing, because it plays “later” in the arranger track.

   NOTE

   If the Arranger mode is not activated or no arranger track exists, Nuendo will work as usual.

Transpose Functions

Nuendo offers transpose functions for audio, MIDI and instrument parts and for audio events. These allow you to create variations of your music or change the harmonics of an entire project or separate sections.

Transpose can be applied on three levels:

- To the entire project

  By changing the project Root Key on the Project window toolbar, the whole project will be transposed.

- To sections of the project

  By creating transpose events on the transpose track, you can set transpose values for separate sections of your project.

- To individual parts or events

  By selecting individual parts or events and changing their transpose value in the info line, you can transpose individual parts or events.

IMPORTANT

The transpose functions do not change the actual MIDI notes or the audio, but only affect the playback.

Apart from the transpose features described in this chapter, you can also transpose all MIDI notes on the selected track using the MIDI modifiers, selected notes using the Transpose dialog, and MIDI tracks using MIDI effects (see the separate PDF document “Plug-in Reference”).

RELATED LINKS

Transposing an entire project with the root key on page 302
Transposing separate sections of a project using transpose events on page 305
Transposing individual parts or events using the info line on page 307
Transpose on page 739
Transpose on page 764

Transposing your music

In the following sections we will describe the different possibilities of transposing your music. Note that these can also be combined. However, we recommend you to set the root key first, before recording or changing transpose values on the transpose track.

IMPORTANT

As a general rule, always set the root key first when you work with content with a defined root key.

Transposing an entire project with the root key

The root key you specify for a project will be the reference that audio or MIDI events in your project will follow. You can however exclude separate parts or events from being transposed, e.g. drums or percussion.

Depending on whether you are using events which already contain root key information or not, the procedures differ slightly.

RELATED LINKS

The Global Transpose setting on page 308

If the events already contain root key information

Let's say you want to create a project based on loops.

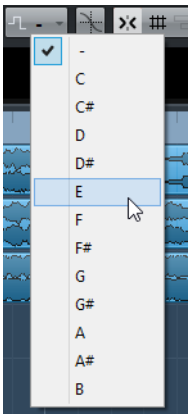
PROCEDURE

1. Open the MediaBay and drag some loops into an empty project.

   For this example, import audio loops with different root keys.

2. Open the Root Key pop-up menu on the Project window toolbar and set the project root key.

   If the Root Key pop-up menu is not visible, right-click the toolbar and select the "Project Root Key" option from the context menu. By default, no project root key is specified ("-").



The entire project will be played back with this root key. To do so, the separate loops are transposed to match the project root key. For example, if you have imported a bass loop in C and the project root key is set to E, the bass loop will be transposed up by 4 semitones.

3. With the root key set, record some audio or MIDI.

   The recorded events will get the project root key.

4. When you are done, you can change the project root key and your events will follow.

IMPORTANT

If you work with drums or percussion, exclude these from being transposed by setting the “Global Transpose” setting on the info line to “Independent”.

RELATED LINKS

Inserting Files into the Project on page 604
The Global Transpose setting on page 308

If the events do not contain root key information

Let’s say you have created a project by recording audio and importing some MIDI loops, and you want to match the root key of the whole project to the register of a certain singer.

PROCEDURE

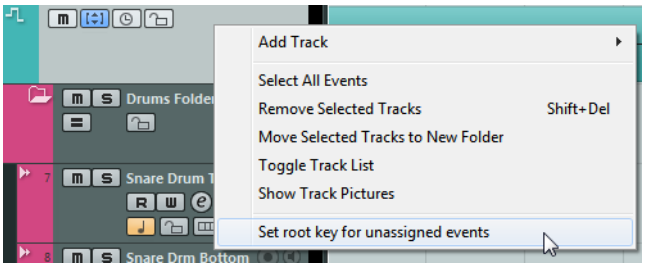
1. Open the Project menu and select “Transpose” from the Add Track submenu (or right-click the track list select the corresponding option from the context menu).

   A transpose track is created. You can only have one transpose track in a project.

2. Set the project to the desired root key by selecting the corresponding option from the Root Key pop-up menu on the Project window toolbar.

3. Right-click the transpose track in the track list and select “Set root key for unassigned events” from the context menu.

   This sets the project root key for all parts or events not containing any root key information. This option is only available, if a project root key has been set.



IMPORTANT

If you work with drums or percussion, exclude these from being transposed by setting the “Global Transpose” setting on the info line to “Independent”.

RELATED LINKS

The Global Transpose setting on page 308

Recording with a project root key

Let’s say that you want to record a guitar line for a project that is in D# minor, but your guitar player prefers to play in A minor. In this case, change the project root key to A, so that you can record your guitar.

PROCEDURE

1. Open your project and set the project root key to A.

   All parts and events will be transposed in order to match the root key.

2. Listen to your project and verify that no drums and percussions have been transposed.

   If drums have been transposed, select them and set their Global Transpose setting to “Independent”.

3. Record your guitar line as desired.

4. When you are done and satisfied with the result, you can change the project root key back to D# minor and your events will follow.

   IMPORTANT

   For recorded audio events and MIDI parts, the “Global Transpose” setting on the info line is automatically set to “Follow”, i.e. the events or parts will get the project root key.

Changing the root key of single events or parts

If you want to check if an audio event or part has root key information or if you want to change it, proceed as follows:

1) Open the Pool and display the Key column by activating the Root Key option on the View/Attributes pop-up menu.
2) Click in the Key column for the desired audio event and set the root key according to your needs.

   You can also check and assign root keys in the MediaBay.

NOTE

If you change the root key of an audio part or event, the corresponding audio file will not change. To save the root key in the audio file, you have to use the “Bounce Selection” function on the Audio menu.

To check or change the root key setting of a MIDI part, proceed as follows:

1) Select your MIDI part in the Project window and check the Project window info line.

   A MIDI part with the root key set to “D”
2) Click on the root key value in the info line to open the corresponding pop-up menu and select the desired root key.

IMPORTANT

If you change the project root key after setting the event root key, the events will keep their own root key settings, and will be transposed to match the project root key. If you record an audio or a MIDI part and the project root key is specified, this root key is automatically set.

Transposing separate sections of a project using transpose events

Sometimes you may want to transpose only certain sections of your project, e.g. to create harmonic variations. This can be done by creating transpose events. Transpose events allow you to add a relative transpose offset by specifying transpose values in semitones.

For example, you can brighten up your loops in C major by transposing them by 5 semitones, so that the subdominant on F major is played back, or you can turn your hit more interesting by transposing the last chorus one semitone upwards.

PROCEDURE

1. Open the Project menu and select “Transpose” from the Add Track submenu (or right-click the track list select the corresponding option from the context menu).

   A transpose track is created. You can only have one transpose track in a project.

2. Select the Draw tool and click in the transpose track to create a transpose event.

   A transpose event will be created from the point where you clicked until the end of the project.

3. To create another transpose event, click with the Draw tool on the first transpose event.

   By default, the transpose value of new transpose events is set to 0.

   You can add more transpose events by clicking with the Draw tool.

4. Click in the transpose value field and enter the transpose value for the transpose event.

   You can enter the desired value with the computer keyboard, use the mouse wheel or [Alt]/[Option]-click on the transpose value to open a value fader. You can specify values between -24 and 24 semitones.

5. Play back your project.

   The parts of your project on the same position as the transpose events will be transposed according to the specified transpose values.

   NOTE

   You can also transpose the whole project using the transpose track. This is useful if your singer does not reach a certain pitch, for example. You could then transpose the whole project by -2 semitones, for example. Always remember to verify that the “Global Transpose” setting for drums and percussion is set to “Independent” on the info line.

   You can erase and move transpose events, but you cannot mute, cut or glue them. The “Locators to Selection” option does not apply on transpose events.

RELATED LINKS

The Global Transpose setting on page 308

Transposing individual parts or events using the info line

You can also transpose individual audio and MIDI parts and events using the info line (or the Inspector). This transposition will be added to the global transposition (i.e. the root key or the transpose events).

PROCEDURE

1. Select the event that you want to transpose.
2. In the Project window info line, adjust the Transpose value as desired.

   NOTE

   A global transpose change will not overwrite individual part or event transpose, but will be added to the transpose value for the part or event. In this case, it might be useful to keep the transposition within the octave range.

RELATED LINKS

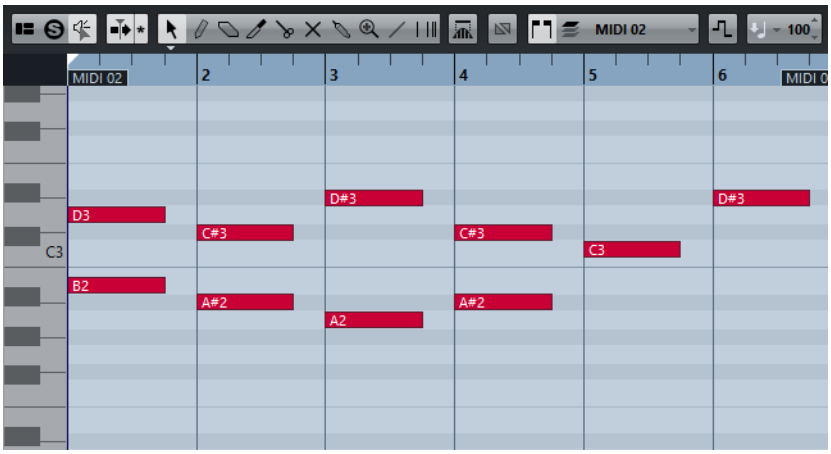
Keep Transpose in Octave Range on page 309

Other functions

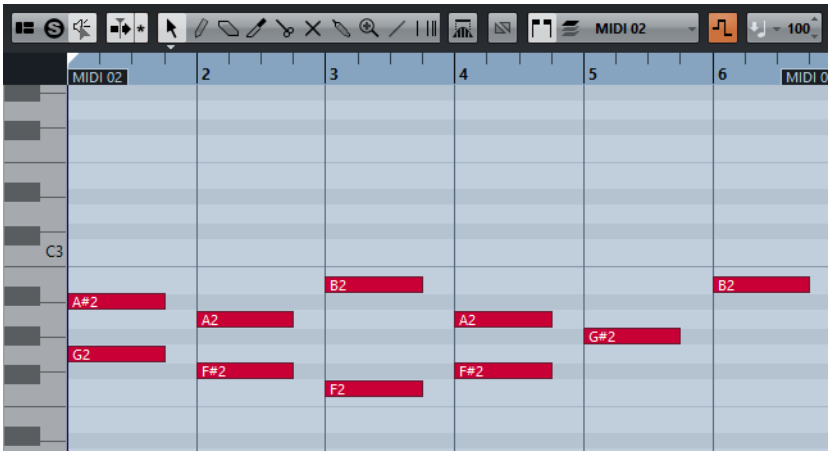
Indicate Transpositions

When you transpose your music using the transpose track, you may sometimes want to visually compare the original sounds and the transposed music. For MIDI parts, you can check this by opening the Key Editor and clicking the “Indicate Transpositions” button.

This will help you to see how your MIDI notes will be transposed. If the button is activated, the Key Editor will show the note pitch you will hear, if it is deactivated, the Key Editor shows the original pitch of the notes in your MIDI part. By default, the “Indicate Transpositions” button is deactivated.



A MIDI part as originally recorded.



When you activate “Indicate Transpositions” you will see how your MIDI part will be transposed.

The Global Transpose setting

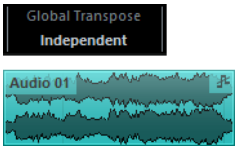
If you are working with drum and percussion loops or special effects (FX) loops, you will want to exclude these from being transposed. This can be achieved by locking them using the Global Transpose setting.

Proceed as follows:

1) Open your project.

2) Select the desired event or part and set the “Global Transpose” setting on the info line to “Independent”.

   A symbol will be displayed in the upper right corner of the selected part or event, indicating that it will not be transposed neither by changing the root key nor by specifying transpose events.



   If Global Transpose is set to Independent, the selected part will not be transposed.

3) You can now change the project root key.

   The “Independent” parts or events will not be affected by the root key changes.

NOTE

If you import ready-made parts or events that are tagged drums or FX, Global Transpose will be automatically set to Independent.

If you record audio or MIDI, Global Transpose will be set to “Independent”, provided that the transpose track exists and you have specified at least one transpose event (even when the transpose value is not defined). In this case, your recording will sound exactly the way you played it. The transpose events will not be taken into account during recording and the recorded event will not get the project root key.

Have a look at the following example:

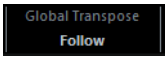
1) Set up a project with the root key in C.
2) Add a transpose track and enter transpose events with the values 0, 5, 7 and 0.
3) Record some chords with your MIDI keyboard. For our example, record C, F, G and C.

The transpose events are not taken into account and the result of your recording will be C, F, G and C. No root key will be set.

NOTE

Recorded events are independent from Global Transpose.

If no transpose track exists or if no transpose event has been added, Global Transpose will be set to Follow.



If Global Transpose is set to Follow, the selected part will follow all global transpositions.

Locking the transpose track

If you want to prevent your transpose events from being changed by mistake, activate the Lock button on the transpose track. This way, you will not be able to move your transpose events or change their transpose values.

Muting transpose events

Sometimes it might be useful to disable the transpose track, e.g. to hear the original sound of individual tracks. If you activate the mute button on the transpose track, your transpose events will not be taken into account during playback.

Keep Transpose in Octave Range

The “Keep Transpose in Octave Range” button on the transpose track (the button with an up and down arrow in brackets) keeps the transposition in the octave range. This option is activated by default. This way, nothing will be transposed by more than seven semitones. This ensures that your music never sounds unnatural because the pitch was raised too high or too low.

To understand the principle behind this, follow the example below:

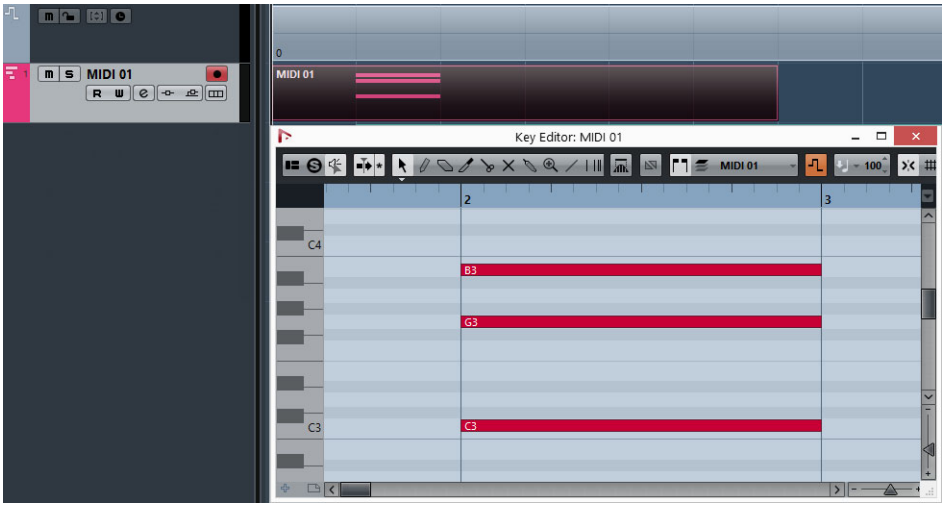
PROCEDURE

1. Create a MIDI part, enter a C major chord, open the Key Editor and activate “Indicate Transpositions”.

   This way you can observe and understand what happens when you change the transposition.

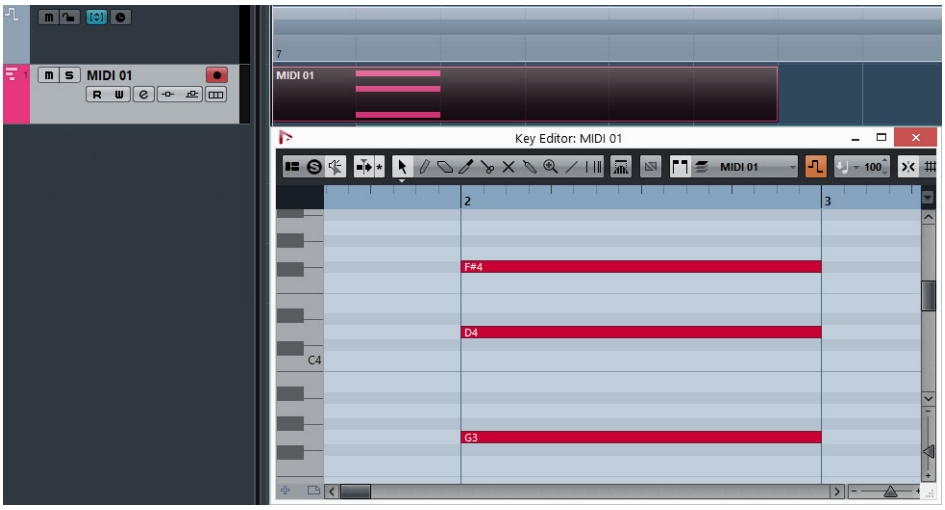
2. Add a transpose track and create a transpose event.

   By default, the transpose value is set to 0.



3. Make sure that the “Keep Transpose in Octave Range” button is activated on the transpose track and change the transpose value of the transpose event to 7.

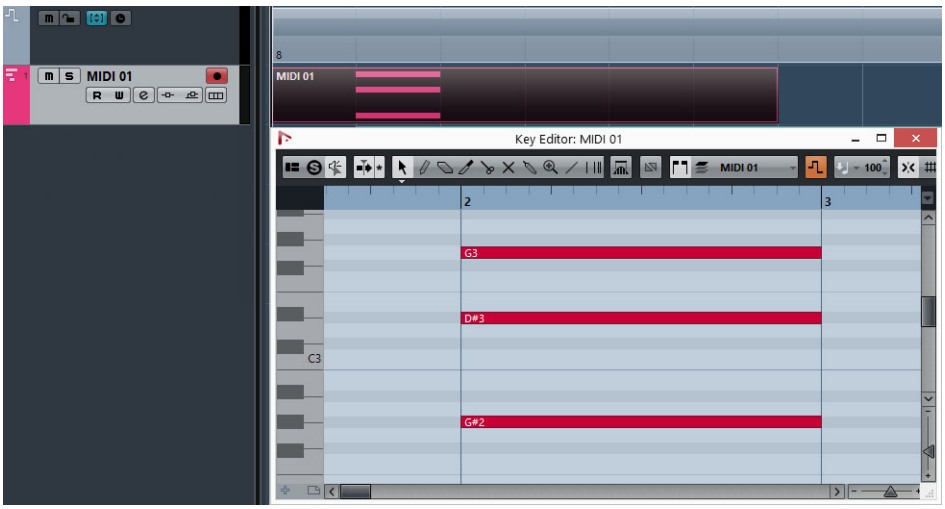
   Your chord will be transposed accordingly.



If you enter a transpose value of 7, your chord will be transposed by seven semitones upwards. In this example, this would be G3/D4/F#4.

4. Set the transpose value to 8 semitones.

   As “Keep Transpose in Octave Range” is activated, your chord will now be transposed to the nearest interval or pitch.



   Your chord has been transposed to the nearest pitch, this results in G#2/D#3/G3.

   IMPORTANT

   If you mainly work with audio loops, we recommend activating “Keep Transpose in Octave Range”.

Markers

Markers are used to locate certain positions quickly. There are two types of markers: position markers and cycle markers.

If you often find yourself jumping to a specific position within a project, you should insert a marker at this position. You can also use markers to make range selections or for zooming.

Markers are located on marker tracks. For postproduction purposes, you can set up multiple marker tracks. This is useful for viewing and working with Edit Decision Lists and CSV files.

Position Markers

Position markers allow you to save a specific position.

Position markers on the marker track are shown as marker events: vertical lines with the marker description (if assigned) and number beside it. If you select a marker track, all its markers are shown in the Inspector.

Cycle Markers

By creating cycle markers you can save any number of left and right locator positions as start and end positions of a range and recall them by double-clicking on the corresponding marker.

Cycle markers are shown on marker tracks as two markers bridged by a horizontal line. Cycle markers are ideal for storing sections of a project.

By defining cycle markers for different actors when post-synchronizing a film project, you can quickly navigate to the sections and repeat or record them again by activating the **Cycle** button on the **Transport** panel.

Setting the Locators Using Cycle Markers

Cycle markers represent ranges in your project. You can use them for moving the left and right locators.

PROCEDURE

- To set the left locator to the cycle marker start and the right locator to the cycle marker end, perform one of the following actions:
  - Double-click on a cycle marker.
  - From the Cycle pop-up menu in the track list, select a cycle marker.

RESULT

The left and right locators are moved to encompass the cycle marker.

AFTER COMPLETING THIS TASK

Now you can move the project cursor position to the start or the end of the cycle marker by moving it to the corresponding locator or use cycle markers to export specific ranges of your project with the **Export Audio Mixdown** dialog.

Editing Cycle Markers

When editing cycle markers on the marker track, snap is taken into account.

- To add a cycle marker, press [Ctrl]/[Command] click and drag on the marker track.
- To change the start/end position of a cycle marker, drag the start/end handle.
- To move a cycle marker to another position, drag the upper border.
- To delete a cycle marker, click with the **Erase** tool.

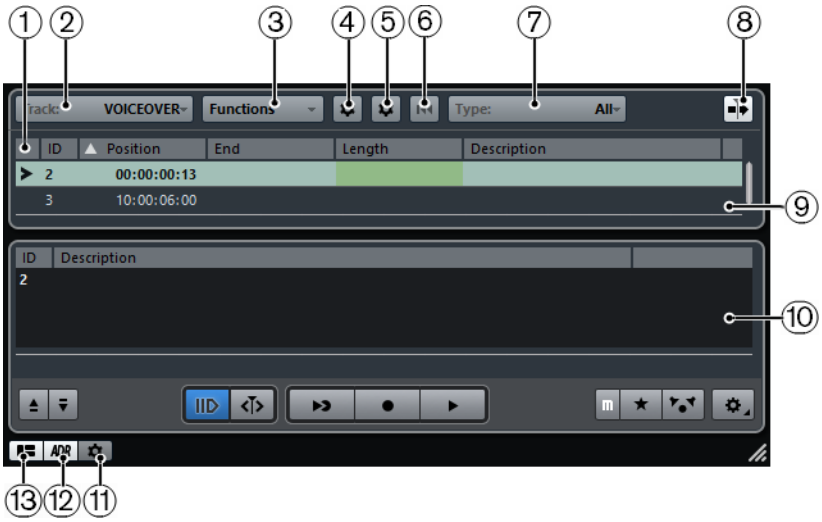
  If you hold down [Alt]/[Option] when you click, all consecutive markers are deleted.
- To trim a cycle marker, select a range in the cycle marker and press [Ctrl]/[Command]-[X].
- To set the marker start/end of the selected cycle marker to the cursor position, select **Project > Markers** to open the **Markers** window, and select **Functions > Set marker start/end to cursor**.
- To create a selection range spanning all tracks in the project, double-click a cycle marker.
- To set the left and right locators, double-click a cycle marker.
- To zoom in on a cycle marker, press [Alt]/[Option] and double-click the cycle marker.

Markers Window

In the **Markers** window you can view and edit markers. The markers on the active marker track are displayed in the marker list in the order in which they occur in the project.

To open the **Markers** window, you have the following possibilities:

- Select **Project > Markers**.
- On the **Transport** panel in the marker section, click **Show**.
- Use a key command (by default [Ctrl]/[Command]-[M]).



1) **Locate arrow**
Indicates which marker is at the project cursor position.

2) **Set focus to marker track**
Allows you to select the marker track that has the focus.

3) **Functions menu**
Lists all functions available in the **Marker** window.

4) **Set up Attribute Columns**
Allows you to set up the attribute columns.

5) **Set up Attribute Columns for Details**
Allows you to set up the attribute columns for the details.

6) **Reset Filters**
Allows you to remove all filters for all columns.

7) **Marker type**
Allows you to specify which marker type is shown in the marker list.

8) **Auto-Scroll with Project Cursor**

Allows you to keep track of the locate arrow, even if your project contains a large number of markers. When this option is activated, the **Marker** window is automatically scrolled to keep the locate arrow visible.

9) **Markers list**

Shows the markers in the order in which they occur in the project.

10) **ADR Panel**

Shows the ADR functions.

11) **Marker Preferences**

Shows the marker preferences.

12) **Show ADR Panel**

Shows the ADR panel.

13) **Show Details View**

Shows the details view.

Editing in the Markers Window

In the **Markers** window you can select, edit, add, move, and remove markers.

- To select a marker, click on it.
- To edit a selected marker, click on it.

  Select multiple markers by [Shift] or [Ctrl]/[Command]-clicking them.
- To add a position marker at the cursor position, select **Functions > Insert Marker**.

  A position marker is added at the current project cursor position on the active marker track.
- To add a cycle marker at the cursor position, select **Functions > Insert Cycle Marker**.

  This adds a cycle marker between the left and right locators on the active marker track.
- To move a marker to the cursor position, select the marker and select **Functions > Move Markers to Cursor**.

  You can also enter the new position numerically in the **Position** column. If a cycle marker is selected, the move operation affects the cycle marker start position.
- To move markers to another track, select the markers, select **Functions > Move Markers to Track**, and select the marker track.
- To remove a marker, select it and select **Functions > Remove Marker**.

Navigating in the Marker List

You can navigate in the marker list using your computer keyboard and select entries by pressing [Enter]. This is a quick and easy way to jump to markers during playback or recording.

- To move to the previous/next marker in the list, press [Up Arrow]/[Down Arrow].
- To jump to the first/last marker, press [Page Up]/[Page Down].
- To step through the attributes of a marker, select a marker, then click again and press [Tab].
- To step back, press [Shift]-[Tab].

NOTE

When working with video, you can use the **Markers** window as a spotting list (a list of timecode values) to position your audio events according to the video events.

RELATED LINKS

Using the Marker window as a spotting list on page 1155

Sorting and Reordering the Marker List

You can customize the display of the marker attributes in the marker list by sorting or reordering the columns.

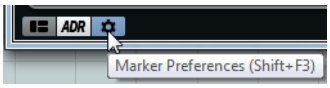
- To sort the marker list by a specific attribute (except Row Count), click on the corresponding column header.
- To reorder the marker attributes, drag and drop the corresponding column headers.
- To adjust the width of a column, place the mouse pointer between two column headers and drag left or right.

NOTE

No matter by which attribute you sort, the second sort criterion will always be the position attribute.

Marker Preferences

You can access the marker preferences by clicking the corresponding button in the bottom left corner of the **Markers** window.



Cycle follows when locating to Markers

This sets the left and right locators automatically to a position or cycle marker, when locating to this marker. This is useful if you need to set the locators on the fly, e.g. during recording for Punch In/Punch Out.

Show marker IDs on marker track

When this option is activated, the marker IDs are shown on the marker track.

Sync Selection

When this option is activated, the **Markers** window selection is linked to the selection in the **Project** window.

Marker Attributes

The following marker attributes are shown in the marker list of the **Marker** window by default:

Locate

An arrow indicates which marker is at the project cursor position (or closest to the project cursor). If you click in this column, the project cursor is moved to the corresponding marker position. This column cannot be hidden.

ID

This column shows the marker ID numbers.

Position

In this column you can view and edit the markers' time positions (or start positions for cycle markers). This column cannot be hidden.

End

In this column you can view and edit the end positions of cycle markers.

Length

In this column you can view and edit the length of cycle markers.

Description

Here you can enter names or descriptions for markers.

RELATED LINKS

Marker IDs on page 321
Cycle Markers on page 312
Filtering Attributes on page 319

Setting Up Attribute Columns

If you want to show different attributes in the **Markers** window, you can set up the attribute columns.

- To show other attributes, click **Set up Attribute Columns**, and select other attributes from the pop-up menu.

  The most common attributes for postproduction are listed in categories according to their usage: General, ADR, Dialog Spotting, Foley, SFX, Background, and User Defined (if available). The standard attributes are found in the Standard Attributes category.

  The number in brackets following the category name helps to get a quick overview of how many attributes of a certain category are displayed as columns in the **Marker** window.

- To show all attributes in the **Marker** window, select **Set up Attribute Columns > Show all**.
- To hide all attributes in the **Marker** window, select **Set up Attribute Columns > Hide all**.

  This hides all attributes except for **Locate** and **Position**.

- To show only the columns that are used for at least one marker, select **Set up Attribute Columns > Show only used Attributes**.
- To consecutively number the rows in the marker list, select **Set up Attribute Columns > Row Count**.

  This can be useful when using filters for certain attributes.

Editing Attributes

There are three different types of attributes: Text, Number, and Yes/No switch. Depending on the type, you can enter text or numerical values, or activate/deactivate the corresponding checkbox.

- To edit a marker attribute, select the corresponding marker, click in the desired attribute column, and make your settings.
- To change the attributes of several markers, select the markers and click the checkbox for the desired attribute.

  All selected markers will change their attributes accordingly. Note that this does not work when clicking on a timecode value or a text field.

NOTE

To navigate in the list of marker attributes, you can also use the [Tab] key and the arrow keys.

Sorting and Reordering Columns

You can customize the display of the marker attributes in the marker list by sorting or reordering the columns.

- To sort the marker list by a specific attribute, click on the corresponding column header.

  NOTE

  No matter by which attribute you sort, the second sort criterion will always be the position attribute.

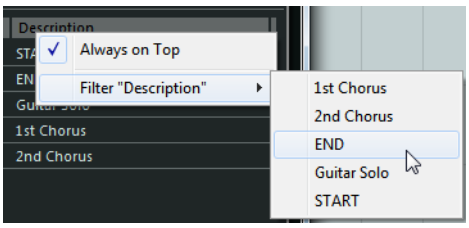
- To reorder the marker attributes, drag and drop the corresponding column headers.
- To adjust the width of a column, place the mouse pointer between two column headers and drag left or right.

Filtering Attributes

When you are working with many markers so that the list is very long, you may want to filter the list to show only markers with a certain attribute value, such as the name of a character. Filter settings are not saved in the project or defaults.

PROCEDURE

1. Right-click on the column header of the attribute that you want to use for the filter.



2. From the **Filter <Attribute Title>** submenu, select the desired attribute value.

RESULT

The marker list is filtered according to your settings, and the column header changes its color to indicate that a filter is applied.

- To remove the filter, right-click the column header and select **Reset <Attribute Title> Filter**.
- To remove all filters for all columns, click **Reset Filters**.

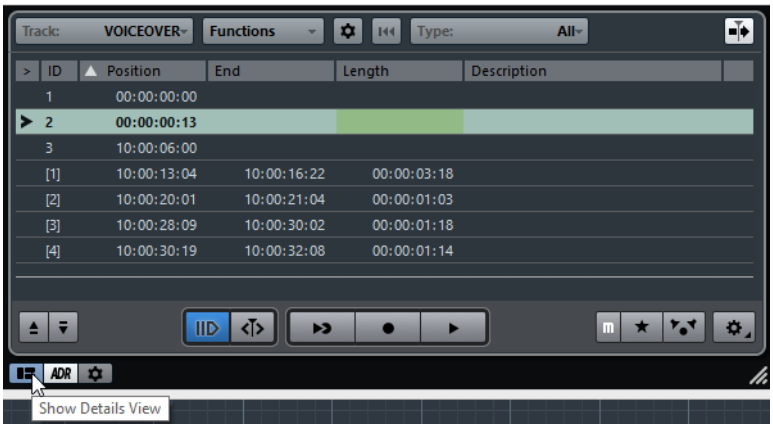
  The filters are also reset if you change the displayed marker track or hide a filtered attribute.

Setting Up the Details View

The Details view shows the details for the marker that is selected in the marker list. The details view supports line breaks which is useful for attributes with long texts. If more than one marker is selected, only the details for the first marker of the selection are shown.

PROCEDURE

1. Click **Show Details View**.



The **Set up Attribute Columns for Details** button is displayed next to the **Set up Attribute Columns** button.

2. Click **Set up Attributes Columns for Details** and select the options from the pop-up menu.

RESULT

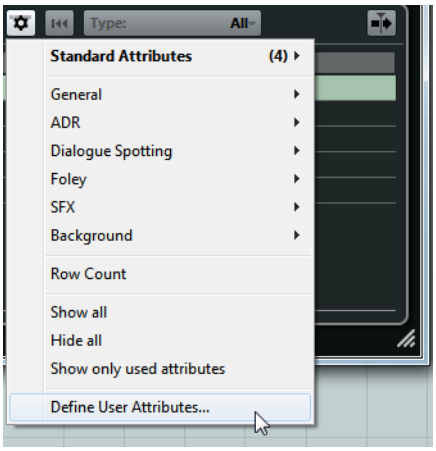
The attributes are shown in the Details view. You can edit the marker details in the same way as in the marker list.

To hide the Details view, click the **Show Details View** button again.

Setting up User Attributes

PROCEDURE

1. Click **Set up Attribute Columns** and select **Define User Attributes**.



2. In the **User Attributes** dialog, click **Add User Attribute** (+).

   A new attribute is added to the attributes list.

   NOTE

   To remove a user attribute, select it and click **Remove User Attribute** (-). The attribute is removed from the list and the pop-up menu.

3. Enter a name for the new attribute and define its type.
4. Optional: Click **Store as Defaults** to save your user attributes as default.

   New projects will contain these attributes in the **User Defined** category of the **Set up Attribute Columns** pop-up menu.

5. Click **OK**.

RESULT

The new attribute is added to the list of available attributes and can be displayed in the **Marker** window.

NOTE

To restore your previously saved user attributes, click **Restore Defaults**. This removes any attributes that are not saved as defaults.

Marker IDs

Each time you add a marker, it is automatically and sequentially assigned an ID number, starting from 1.

IDs for cycle markers are shown in brackets and start from [1]. ID numbers can be changed at any time – this allows you to assign specific markers to key commands.

NOTE

If you move a marker from one marker track to another by drag & drop in the **Project** window and the marker ID is already used on this track, the inserted marker automatically gets a new ID.

Reassigning Marker IDs

Sometimes, especially when setting markers on the fly, you may forget or miss to set a marker. When added later, this marker's ID will not correspond to its position on the marker track. Therefore, it is possible to reassign the IDs for all markers on a track.

PROCEDURE

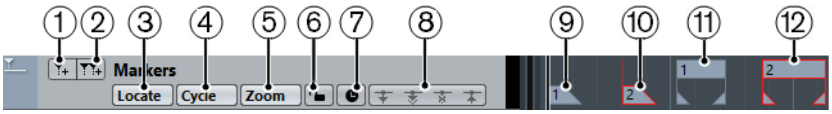
1. Open the **Markers** window.
2. Select the marker track whose ID numbers you want to reassign.
3. Open the **Functions** pop-up menu and select either **Reassign Position Marker IDs** or **Reassign Cycle Marker IDs**.

RESULT

The marker IDs of the selected type are reassigned to match the order of markers on the marker track.

Marker Track

Marker tracks are used for adding and editing markers.



1) **Add Marker**
Adds a position marker at the cursor position.

2) **Add Cycle Marker**
Adds a cycle marker at the cursor position.

3) **Locate pop-up menu**
If you select a position or a cycle marker in this pop-up menu, the corresponding marker in the event display or in the **Markers** window is selected.

4) **Cycle pop-up menu**
If you select a cycle marker in this pop-up menu, the left and right locators are set to the corresponding cycle marker.

5) **Zoom pop-up menu**
If you select a cycle marker in this pop-up menu, the view zooms to the corresponding cycle marker.

6) **Lock**
Locks the marker track. When a marker track is locked, you cannot edit the track and its markers. However, you can still rename the track or change its status (active/inactive).

7) **Toggle Time Base**
Sets the track time base.

8) **Network Controls**

9) **Marker event (inactive)**
Shows an inactive marker event.

10) **Marker event (active)**
Shows an active marker event.

11) **Cycle marker event (inactive)**
Shows an inactive cycle marker event.

12) **Cycle marker event (active)**
Shows an active cycle marker event.

Adding, Moving, and Removing the Marker Track

- To add a marker track to the project, select **Project > Add Track > Marker**.
- To move a marker track to another position in the track list, click and drag it up or down.
- To remove one or more marker tracks, right-click them in the track list and select **Remove Selected Tracks**.
- To remove an empty marker track, select **Project > Remove Empty Tracks**.
  This also removes any other tracks that are empty.

NOTE

When you remove all marker tracks, the marker track that you removed last (including all its markers) is moved to the clipboard. If you later insert a new marker track, this track is pasted from the clipboard into the track list.

Multiple Marker Tracks

You can create up to 32 marker tracks. Multiple marker tracks are useful when working in a postproduction context. For example, they can be used to import Edit Decision Lists (EDLs) or import/export CSV files for Automatic Dialogue Replacement (ADR).

A possible scenario would be to create a marker track with cycle markers for sections of the audio, and another marker track with important sync points in the video. You can also use multiple marker tracks to insert markers for different users in a network or different narrators in a movie.

Naming marker tracks

By default, the first marker track you create is called “Marker”, the second “Marker 02”, and so on. If you work with multiple marker tracks, it is recommended to name marker tracks according to their purposes, e.g. audio, video, or scene.

You can name marker tracks by double-clicking on the marker track name in the track list or the Inspector and entering a new name.

The active marker track

When you are working with multiple marker tracks, only one track is active. All editing functions affect the markers on the active track only. You activate a track by clicking the **Activate this track** button in the track list.

The following rules apply:

- When you add a new marker track, this track is automatically active.
- When you remove an active track, the topmost marker track in the track list is activated.When using cycle markers for zooming, only the cycle markers of the active track are displayed on the **Zoom** pop-up menu.
- When exporting an audio mixdown of the audio between the cycle markers, only the cycle markers of the active track are displayed in the **Export Audio Mixdown** dialog.
- Most marker key commands affect the active track.

Locking marker tracks

You can lock one or more marker tracks by clicking the corresponding lock button of the track. When a marker track is locked, you cannot edit the track and its markers. However, you can still rename the track or change its status (active/inactive). In the **Markers** window and the Project Browser, the unavailable features of a locked track are grayed out.

RELATED LINKS

Editing Cycle Markers on page 313
Importing and Exporting Markers on page 327

Working with Multiple Marker Tracks

Let's say you have a video project where the dialogue of two narrators is to be replaced. All you have to do is create different marker tracks for the individual narrators and set up the markers according to the video sections that need to be dubbed.

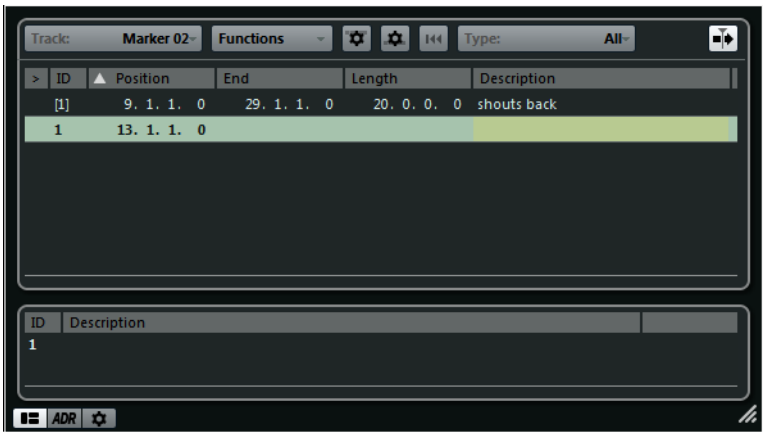
PREREQUISITE

You have added at least two marker tracks to the project and named them.

PROCEDURE

1. Select **File > Key Commands**.
2. In the **Marker** category, set up a key command for **Insert and name Marker**.

   This command adds a position marker, opens the **Markers** window and activates the **Description** column.
3. Set up key commands for **Activate next Marker Track** and **Activate previous Marker Track**.
4. Activate the marker track for the first narrator, and play back the video file.

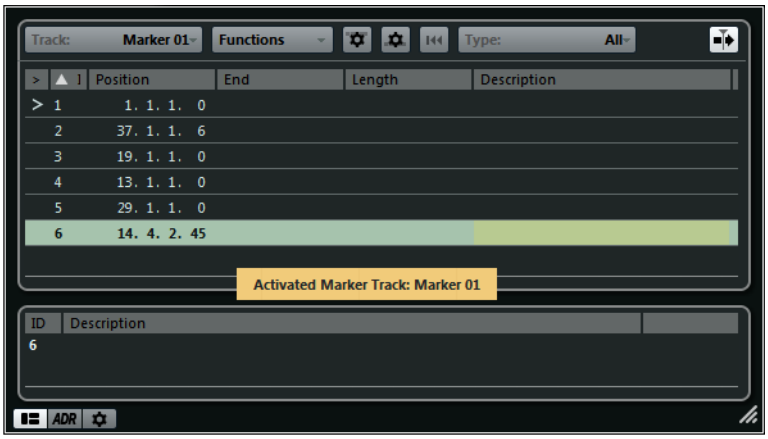


5. At the position where the first dialogue section should be replaced, trigger **Insert and name Marker**.

   The **Marker** window opens with the **Description** column is active, so that you can insert a name for the new marker.
6. Enter a name or description for the section, and press [Return] to confirm.

   A new marker is created on the active track in the **Project** window.
7. Activate the track on which you want to insert the next marker using the **Activate next/previous Marker Track** key command.

   A message informs you that a different marker track is now active.



8. Trigger the **Insert and name Marker** key command at the position where the next dialogue section should be replaced.

   Repeat this procedure for all markers that you want to insert.

Editing Markers on the Marker Track

- To add a position marker, click **Add Marker** or use the **Draw** tool.
- To add a cycle marker, click **Add Cycle Marker** or use the **Draw** tool.
- To select a marker, use the standard techniques.
- To resize a cycle marker, select it and drag the handles. You can also do this numerically on the info line.
- To move a marker, select it and drag it. You can also edit marker positions on the info line.

  If you move markers from one track to another, the marker gets the numbering of the first free marker ID on the track where it is dropped.
- To remove a marker, select it and press [Delete] or use the **Erase** tool.

RELATED LINKS

Marker IDs on page 321

Using Markers to Select Ranges

Markers can be used in conjunction with the **Range Selection** tool to make range selections in the **Project** window. This is useful if you quickly want to make a selection that spans all tracks in the project.

PROCEDURE

1. Set markers at the start and end of the section that you want to move or copy.
2. Select the **Range Selection** tool and double-click on the marker track between the markers.

   Everything in the project within the marker boundaries is selected. Any functions or processing you perform now affect the selection only.
3. Click on the marker track in the selected range and drag the range to a new position.

   If you hold down [Alt]/[Option] while you drag the range, the selection in the **Project** window is copied instead.

Importing and Exporting Markers

Markers and marker tracks can be imported and exported.

The following files can contain markers:

- EDL files (edit decision lists)
- CSV files (comma separated values)
- MIDI files
- Track archives

Edit Decision Lists

You can import Edit Decision Lists (EDLs) in CMX3600 format.

EDLs are cut lists, i.e. representations of video edits that can be used to align audio events to a reference video file. They contain reel and timecode data that help you to detect the exact position of each video clip. Most EDLs are simple ASCII files created by offline editing systems, but you can also create, open, and edit them manually with a text editor.

The information contained in an EDL can be used in Nuendo to place audio events in the **Project** window at the specific timecode positions that correspond to the edits made in the video editing suite.

EDLs allow you to edit your audio according to the cuts of a video. When you import an EDL in Nuendo together with the cut video file, each cut described in the EDL is indicated by a marker.

NOTE

Every track in the EDL results in a new marker track in Nuendo. One video track and up to four audio tracks of the EDL can be imported.

Importing an EDL

PROCEDURE

1. Create a new project.

   This is not strictly necessary, but helps you keep track of things.

2. Set up the project frame rate according to the frame rate of the EDL that you want to import.

   For EDL import, Nuendo supports the frame rates 24 fps, 25 fps, 29.97 fps, 29.97 dfps, 30 fps, and 30 dfps.

3. Select **File > Import > EDL CMX3600**.
4. Select the file that you want to import and click **Open**.
5. In the **Import Options** dialog in **Import** column, activate the marker tracks that you want to import.

   You can also select all tracks by clicking the Select All Tracks button.

6. In the sections **Marker Options - Video** and **Marker Options - Audio**, select whether you want to import position or cycle markers.
7. Click **OK** to import the EDL file.

   If there are EDL edits outside the current project range, you are asked if you want the range to be automatically adjusted.

Scene Detection with EDL files

EDL CMX3600 files can also be used for scene detection. Scene detection can be useful if you want to fill specific sections of your project with a certain background atmosphere. Do do so, set the locators to the cycle marker and select **Edit > Functions > Fill Loop**. On import, each scene is indicated by a colored cycle marker.

Nuendo supports the following ways of scene naming:

- Three number scene naming, e.g. 25-3-5

  The first is the scene number, the second is the setting or shooting angle and the third is the take number. As separators, the following characters can be used: comma (,), semicolon (;), full stop (.), hyphen (-), underscore (_), slash (/), backslash (\).

```
002  7350     V     C        11:58:48:17 11:58:54:10 10:00:05:04 10:00:10:22
* FROM CLIP NAME:  37401/2/3-K1.NEW.01

003  7351     V     C        11:58:54:10 11:58:55:22 10:00:10:22 10:00:12:09
* FROM CLIP NAME:  37401/2/3-K2.NEW.01
```

- Clip names

  Scenes can also be identified by their clip names.

```
001  UNTITLED AA/V  C        01:02:19:14 01:02:30:20 01:00:00:00 01:00:11:06
* FROM CLIP NAME:  C0007.MOV
* COMMENT:
* CLIP FILTER: SHIFT FIELDS
AUD   3     4

002  UNTITLED AA/V  C        01:02:30:20 01:02:40:17 01:00:11:06 01:00:21:03
* FROM CLIP NAME:  C0008.MOV
* COMMENT:
* CLIP FILTER: SHIFT FIELDS
AUD   3     4
```

Recommendations

When exporting EDLs from your offline editing system, keep the following rules in mind in order to achieve the best import results in Nuendo:

- Export your EDL in CMX3600 format.

  Nuendo only supports the CMX3600 format.

- Add clip names as comments to the EDL and use a consistent naming scheme.

  These names are used for naming markers and detecting scenes.

NOTE

Make sure that you set the correct export options in your video editing application (e.g. Final Cut Pro, Avid Xpress Pro) when creating the EDL.

CSV Files

In Nuendo, you can import CSV (Comma Separated Values) files that were created with an additional program (taker program, etc.) or manually (text editor, Excel, Open Office, etc.). The values in the file should be separated by comma, semicolon, or tab and must contain at least timecode in information. Make sure that the CSV file uses the file extension “*.csv”.

On import, the data in the CSV file will be interpreted as markers. For example, these help you to detect the exact timecode position of each audio or video clip. This is extremely useful if you want to create dubbed or synchronized audio versions of your video.

Importing a CSV File

PROCEDURE

1. Create a new project.

   This is not strictly necessary, but helps you keep track of things.

2. Set up the project frame rate according to the frame rate of the EDL that you want to import.

   For CSV import, Nuendo supports the frame rates 24 fps, 25 fps, 29.97 fps, 29.97 dfps, 30 fps, and 30 dfps.

3. Select **File > Import > CSV Marker**.

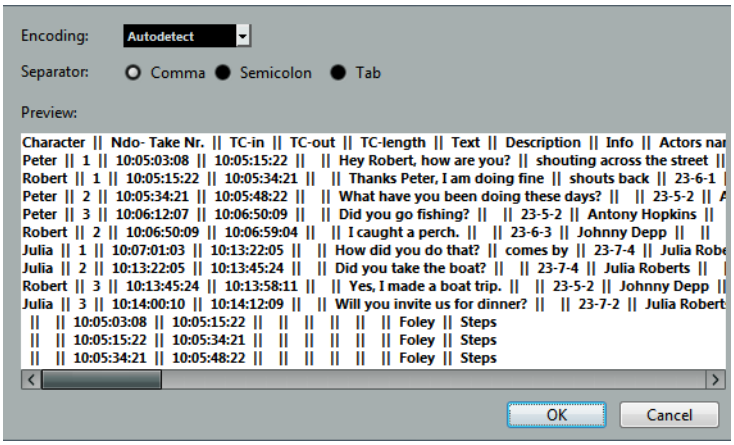
4. Select the file that you want to import and click **Open**.

5. In the **CSV Import - Encoding** dialog, make your settings an click **OK** to apply them.

   If you are not sure which encoding method was used, select the **Autodetect** option.

   NOTE

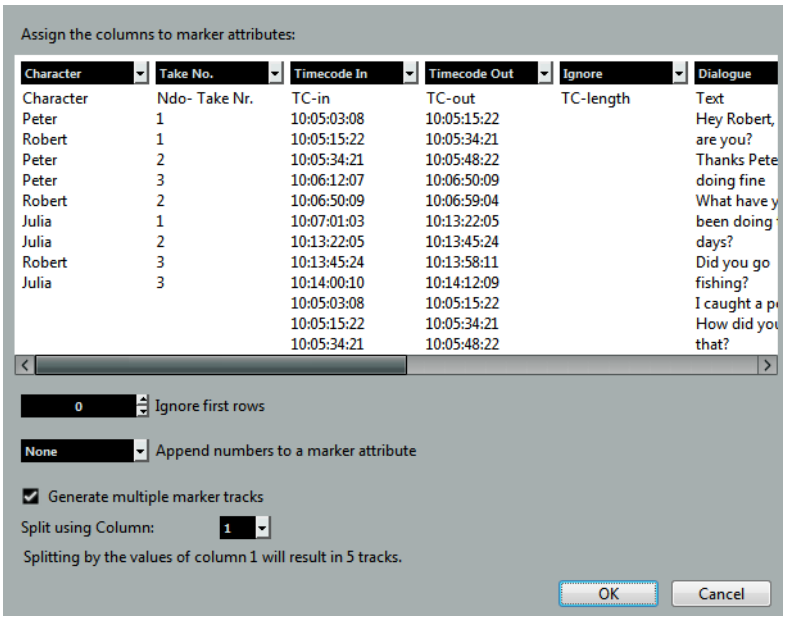
   The Preview section gives you visual feedback of how Nuendo interprets the data contained in the CSV file. If the data is not displayed correctly, try another encoding method.



6. In the **CSV Import - Attribute Selection** dialog, make your settings and click **OK** to apply them.

   NOTE

   Note that at least the attribute for timecode in has to be assigned.



7. In the **Import Options** dialog, select the tracks that you want to import by activating the corresponding tracks in the Import column to the left, or select all tracks by clicking the **Select All Tracks** button.
8. Click **OK** to import the CSV file and close the dialog.

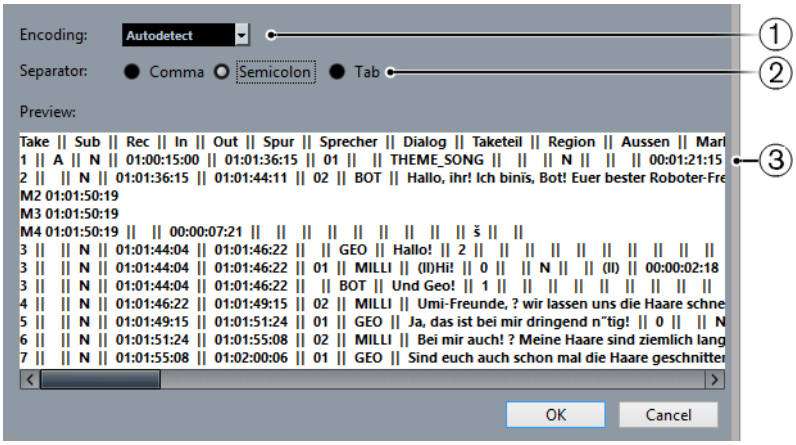
RESULT

The data contained in the CSV file is imported into marker tracks in Nuendo.

RELATED LINKS

CSV Import - Encoding on page 331
CSV Import - Attribute Selection on page 332

CSV Import - Encoding



1) **Encoding**

Allows you to select the encoding method of the file that you want to import. If you are not sure which encoding method was used, select **Autodetect**.

2) **Separator**

Allows you to select the separator type of the CSV file that you want to import.

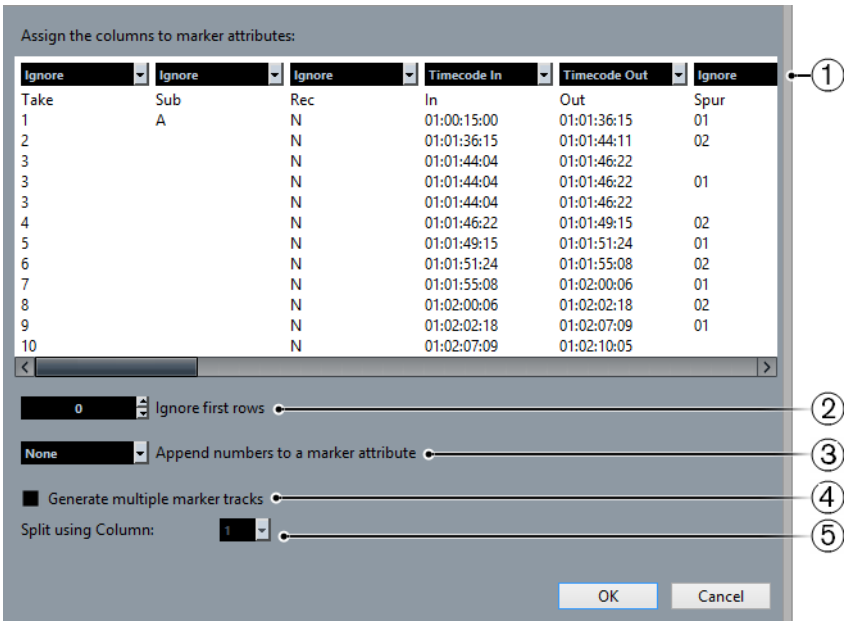
3) **Preview**

Gives you visual feedback of how Nuendo interprets the data contained in the CSV file.

NOTE

If the data is not displayed correctly, try another encoding method.

CSV Import - Attribute Selection



1) **Column pop-up menus**

These menus allow you to assign marker attributes. You must assign at least **Timecode In**.

2) **Ignore first rows**

Allows you to specify how many lines you want to exclude from import. Use this, if your CSV file contains column headers that you want to exclude from import.

3) **Append numbers to a marker attribute**

Allows you to add a counter to a marker attribute. This is useful, if you later sort the marker list by this attribute in the **Markers** window.

NOTE

Do not use this attribute to split your CSV file.

4) **Generate multiple marker tracks**

Activate this, if you want the markers to be placed on different tracks.

5) **Split using Column**

Allows you to specify by what column the markers are sorted. This specifies that all lines with the same value in the split column are imported into the same marker track in Nuendo.

Exporting Markers as CSV File

You can export the markers you set up in Nuendo as CSV (Comma Separated Values) files to use them as dispositions. These are useful in recording studios, as they allow you to determine for how long a specific narrator is needed, etc. This makes it easier to calculate time and costs of a synchronization project.

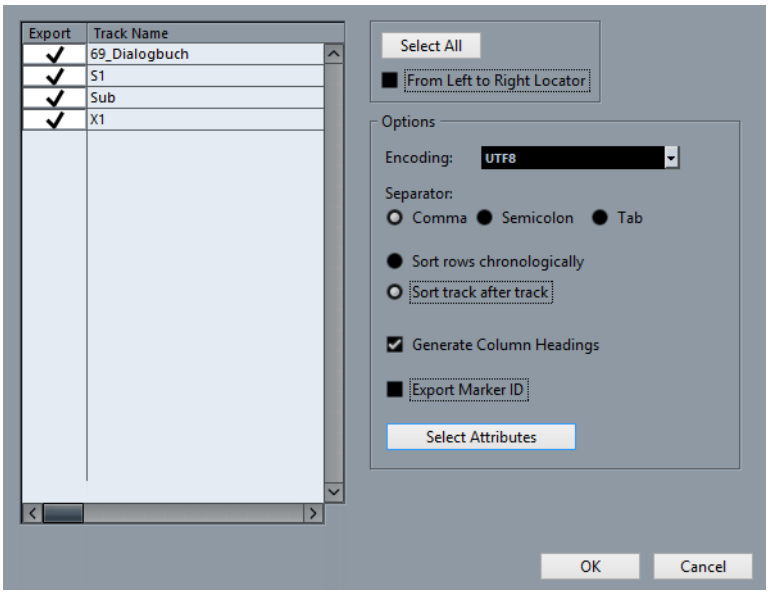
PROCEDURE

1. Set up the markers for your project.
2. Select **File > Export > CSV Marker**.
3. In the **Export Options** dialog, activate the marker tracks that you want to export in the **Export** column.

   To select all marker tracks, click **Select All**.
4. On the right of the dialog, make your settings.
5. Optional: To specify which marker attributes you want to export, click **Select Attributes**, and in the **CSV Export - Attribute Selection** dialog, make your settings.

   Click **OK** to confirm your attribute selection and close the **Select Attributes** dialog.
6. Click **OK** to export your markers as a CSV file.

Export Options



Export column

Allows you to activate the tracks that you want to export.

Select All

Allows you to activate all tracks for export.

Encoding pop-up menu

Allows you to select an encoding format for your CSV file. The available formats are: UTF8, UTF16, Win-1252/Win Latin1, MacRoman, Mac Central European, and Shift JIS.

Separator

Activate one of the options to specify the kind of separator used in your file. The available options are: Comma (default setting), Semicolon, and Tab.

Sort rows chronologically

Activate this if you want to sort the markers according to their position on the timeline.

Sort track after track

Activate this if you want to sort the markers by their track name.

Generate Column Headings

Activate this if you want to generate column headings.

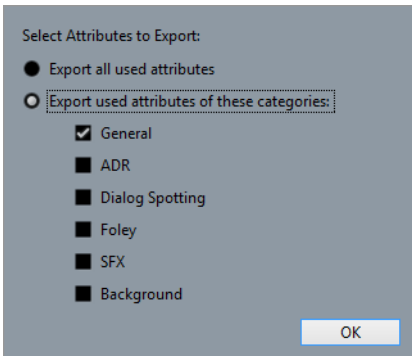
Export Marker ID

Activate this if you want to export the marker ID.

Select Attributes

Allows you to open the **CSV Export - Attribute Selection** dialog where you can specify which marker attributes you want to export.

Attribute Selection



Export all used attributes

Allows you to export all used attributes, i.e. attributes where at least one marker has a value.

Export used attributes of these categories

Allows you to select specific attribute categories only.

RELATED LINKS

Marker Attributes on page 317

Importing Markers via MIDI

You can import position markers by importing MIDI files containing markers. This is useful if you want to use your marker tracks in other projects or if you want to share them with other Nuendo users. Any markers you have added are included in the MIDI file as standard MIDI file marker events.

- Select **File > Preferences > MIDI > MIDI File** and make sure **Import Markers** is activated.

The following settings are imported:

- The start position of position markers and cycle markers
- The track assignment of markers
- All marker tracks

NOTE

If you import a standard MIDI file created in other applications, all markers are merged on one marker track.

RELATED LINKS

Importing MIDI files on page 1205

Exporting Markers via MIDI

You can export your markers as part of a MIDI file.

- To include any markers in the MIDI file, activate **Export Markers** in the **Export Options** dialog.

The following settings are exported:

- The start position of position markers and cycle markers.
- The track assignment of markers.
- All marker tracks

NOTE

To be able to export markers via MIDI export, your project must contain at least one marker track.

RELATED LINKS

Exporting MIDI files on page 1203

Importing Markers as Part of a Track Archive

You can import position markers and cycle markers by importing track archives containing marker tracks. Select the tracks that you want to import in the **Import Options** dialog.

The following settings are imported:

- The start and end positions of cycle markers
- The track assignment of markers
- The marker IDs
- The attributes
- All marker tracks

RELATED LINKS

Importing Tracks from a Track Archive on page 1208

Exporting Markers as Part of a Track Archive

If you want to use your marker tracks in other projects, for example to share them with other users, you can export them as part of a track archive. Select the marker tracks that you want to export and select “Selected Tracks…” from the Export submenu of the File menu.

The following settings are exported:

- The start and end positions of cycle markers
- The track assignment of markers
- The marker IDs
- The attributes
- All marker tracks

RELATED LINKS

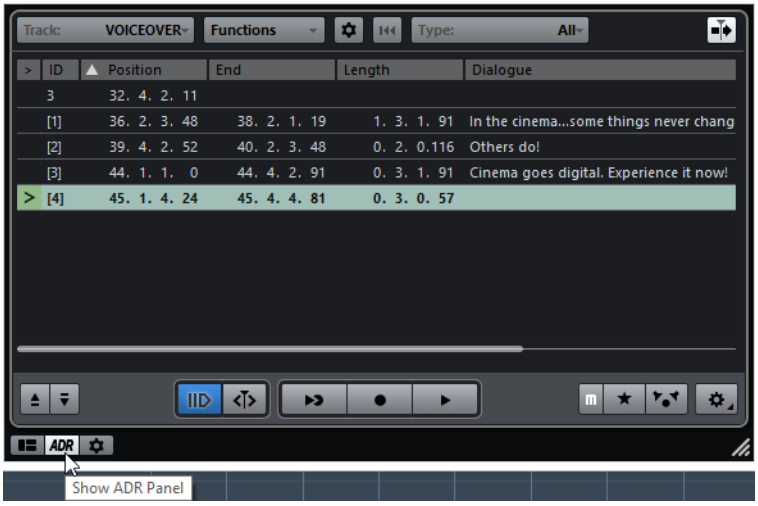
Exporting tracks as track archives on page 1207

ADR

The **ADR** panel allows you to perform ADR and language dubbing tasks.

Sometimes, you must re-record dialogue from production tracks or dub them in a different language. When you do this, the original takes are played back to allow the dubbing actor to listen to the original production track as a guide. The actor can then rehearse the dialogue and re-record it. These tasks can be performed with the ADR functions that are located in the **ADR** panel of the **Marker** window.

To open the **ADR** panel, select **Project > Markers** and click **ADR** at the bottom of the **Marker** window.



To get the most out of the ADR functions, it is important that you understand the following concepts:

- ADR and Selecting Markers
- ADR Statuses (Rehearse, Record, Review)
- ADR Modes (Automatic, Free Run)

ADR and Marker Selection

The ADR functionality makes extensive use of markers.

In the marker list, you can select cycle markers to set the start and end position for **Rehearse**, **Record**, and **Review**.

If you select position markers, only the start position is set.

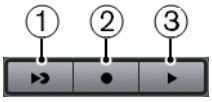
If no marker is selected, the start position for any ADR status in **Automatic** mode is determined by the left locator. In **Free Run** mode, the start position is determined by the project cursor position.

NOTE

You can also select multiple markers, for example, to combine multiple takes.

ADR Statuses

The ADR statuses **Rehearse**, **Record**, and **Review** are transport functions that have been designed specifically for ADR tasks.



1) **Rehearse**
   Allows you to play back the take, so that the artist can rehearse it.

2) **Record**
   Allows you to record the take on the record-enabled track.

3) **Review**
   Allows you to play back the recorded take for review.

NOTE

The ADR statuses take into account all settings in the **ADR Setup** window.

RELATED LINKS

ADR Setup on page 341

ADR Modes

You can select either **Automatic** mode or **Free Run** mode.

NOTE

The ADR modes take into account all settings in the **ADR Setup** window.

Automatic

This mode is activated by default. It allows you to record a take according to the position and length of the selected marker. In the different ADR statuses, the following happens:

- If you click **Rehearse**, a locator range according to the position and length of the selected markers is selected in the **Project** window ruler. The project cursor jumps to the start of the **Pre-roll** phase and playback starts. At the end, the project cursor automatically jumps back to the start position.
- If you click **Record**, the project cursor jumps to the start of the **Pre-roll** phase and playback starts. When the left locator is reached, recording starts. At the end of the **Post-roll** phase, recording stops automatically and the project cursor jumps back to the left locator. The recorded event is automatically resized to this position.
- If you click **Review**, the project cursor jumps to the start of the **Pre-roll** phase and playback starts. At the end of the **Post-roll** phase, playback stops automatically and the project cursor jumps back to the take start position.

Free Run

Activate this mode for more flexibility. It allows you to use the project cursor position as the ADR start position. You can set the project cursor position manually or using a marker in the marker list. Free run mode works as follows:

- If you click **Rehearse**, the left locator is set to the project cursor position and playback starts from there. If **Pre** is enabled, playback starts with the pre-roll that you defined in the **ADR Setup** window. Playback stops when you click **Stop**.
- If you click **Record**, the project cursor jumps to the take start position and recording starts. If **Pre** is enabled, playback starts at the beginning of the pre-roll phase and recording starts when the take start position is reached. Recording stops when you click **Stop**.
- If you click **Review**, the project cursor jumps to the take start position and playback starts. If **Pre** is enabled, playback starts at the beginning of the pre-roll phase. Playback stops when you click **Stop**.

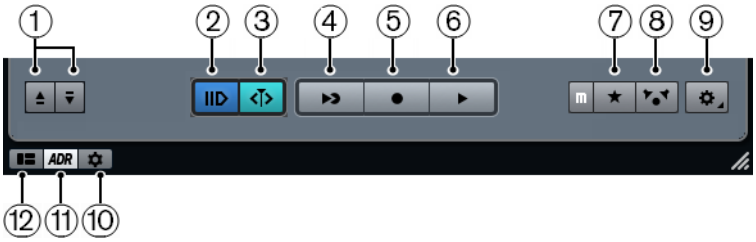
NOTE

If **Return to Start Position on Stop** is activated (**File > Preferences > Transport**), the project cursor returns to the take start position.

ADR Panel

The **ADR** panel is located in the lower part of the **Marker** window.

- To open the **ADR** panel, select **Project > ADR Panel**.



1) **Locate Previous/Next Marker in Marker Window**

   Allows you to select the previous/next marker in the marker list. If **Sync Selection** is activated in the **Marker Preferences**, the corresponding locator range is also selected in the **Project** window ruler.

2) **Pre-Roll On/Off**

   Allows you to activate/deactivate a pre-roll for the **Free Run Mode**.

3) **Free Run Mode On/Off**

   Activate this mode to start from the project cursor position. On stop, the cursor returns to the start position by default. You can change this by deactivating **Return to Start Position on Stop** (**File > Preferences > Transport**).

   Deactivate this mode to use the selected cycle marker. Pre-roll and post-roll are determined by the settings on the **General** tab in the **ADR Setup** window.

4) **Rehearse**

   Plays back the selected take so that the artist can rehearse it.

5) **Record**

   Records the selected take on the record-enabled track.

6) **Review**

   Plays back the take for review. To enable this, on the **Signal Switchboard** tab, activate **Take** in **Review** mode for **Other Audio** for the **Control Room** and **Cue 1**.

7) **Guide Track for Cue 1 On/Off**

   Allows you to mute the guide track for cue 1.

8) **Guide Track for Control Room On/Off**

   Allows you to mute the guide track for the **Control Room**.

9) **Setup**

   Allows you to open the **ADR Setup** window.

10) **Marker Preferences**

Allows you to show the marker preferences.

11) **Show ADR Panel**

Allows you to show/hide the **ADR** panel.

12) **Show Details View**

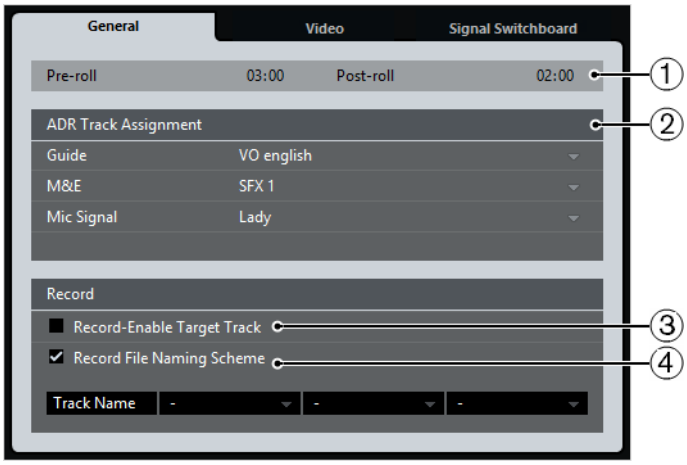
Allows you to show/hide the details view.

RELATED LINKS

ADR Modes on page 339
Signal Switchboard Tab on page 343
ADR Setup on page 341

ADR Setup

General Tab



1) **Pre-roll/Post-roll**

Allows you to enter a **Pre-roll/Post-roll** value.

NOTE

You can set a value for **Audio Pre-Record Seconds** (**File > Preferences > Record > Audio**). The post record time corresponds to the post-roll time.

2) **ADR Track Assignment**

Allows you to specify which tracks you want to use as guide, M&E, and mic signal.

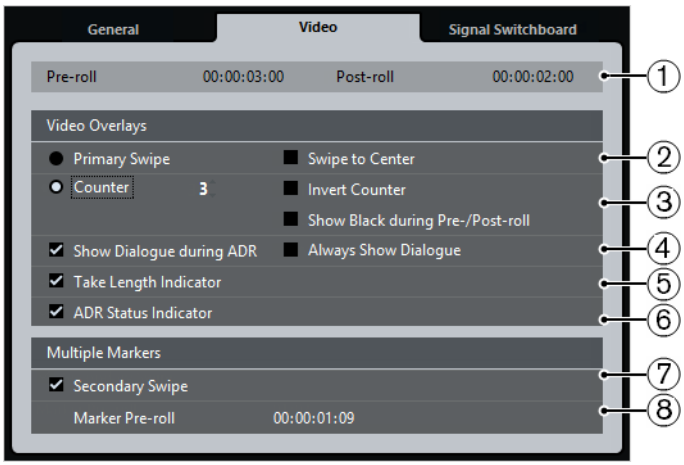
3) **Record Enable Target Track**

Allows you to automatically record-enable the target track. To enable this, you must set up the **Target Track** marker attribute.

4) **Record File Naming Scheme**

Allows you to specify a naming scheme for the recorded files that is added to the track name as a suffix.

Video Tab



1) **Pre-roll/Post-roll**

Allows you to enter a **Pre-roll**/**Post-roll** value.

NOTE

You can set a value for **Audio Pre-Record Seconds** (**File > Preferences > Record > Audio**). The post record time corresponds to the post-roll time.

2) **Primary Swipe**

Activate this to display a bar that swipes from the left to the right side of the **Video Player** window as a take start indicator. The **Pre-roll** value defines the duration of the swipe.

Activate **Swipe to Center** to display two bars that swipe from the left and right sides to the center of the **Video Player** window.

3) **Counter**

Activate this to display a count-in by numbers as a take start indicator in the **Video Player** window. Specify a start number in the value field to the right. The interval between each count is one second. The metronome is automatically synchronized with the counter.

Activate **Invert Counter** to invert the order of the displayed numbers.

Activate **Show Black during Pre-/Post-roll** to show a black picture during pre-roll and post-roll.

4) **Show Dialogue during ADR/Always show Dialogue**

These options allow you to show the dialogue attribute of the selected marker.

Activate **Show Dialogue during ADR** to display the **Dialogue** marker attribute as a video overlay in the **Video Player** window during one of the ADR modes.

Activate **Always show Dialogue** to always display the dialogue marker attribute.

5) **Take Length Indicator**

Activate this to show a take length indicator at the bottom of the **Video Player** window.

6) **ADR Status Indicator**

Activate this to show an ADR status indicator at the top left corner of the **Video Player** window.

Rehearse status is indicated with a yellow indicator, record status with a red indicator, and review with a green indicator.

7) **Secondary Swipe**

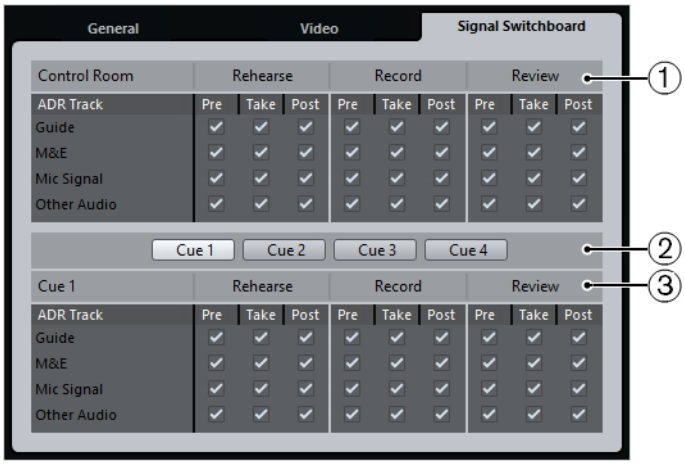
If you selected multiple markers, activating this option displays a swipe as a pre-roll for every take.

8) **Marker Pre-roll**

Allows you to define a pre-roll for the secondary swipes.

Signal Switchboard Tab

The **Signal Switchboard** tab allows you to define which signals are heard during the different ADR phases. This helps you to set up different schemes for the dubbing artist and the ADR operator, for example.



1) **Control Room section**

Allows you to specify the track that you hear in the Control Room channel during rehearse, record, and review. Furthermore, you can determine if you want to hear the signal during the preroll, take, and postroll phases.

2) **Cue selectors**
Allow you to switch to another cue channel.

3) **Cue section**
Allows you to specify the track that you hear in the selected Cue channel during rehearse, record, and review. Furthermore, you can determine if you hear the signal during the preroll, take, and postroll phases.

NOTE

In the **MixConsole**, make sure that the Control Room and cue channels are set up correctly.

RELATED LINKS

Enabling Automatic Record-Enabling for Target Tracks on page 348

Setting Up ADR Tracks

To use the available functions in the **ADR** panel, you must set up your project first.

Creating a Guide Track

The guide track is to play back the original dialogue that you want to replace.

PROCEDURE

1. Create an audio track or a group and name it so that you can recognize it as the guide track.
2. Set the **Output Routing** pop-up menu to the Stereo Out output bus that is set as the Main Mix.

Creating an M&E (Music and Effects) Track

The M&E track is designed to play back music and effects.

PROCEDURE

1. Create an audio track or group and name it so that you can recognize it as the M&E track.
2. Set the **Output Routing** pop-up menu to the Stereo Out output bus that is set as the Main Mix.

Creating a Mic Track

The mic track is designed to lead the signal that is to be recorded. For this to work, you must activate its **Monitor** button.

PROCEDURE

1. Create an audio track for the mic signal.
2. In the **Inspector**, set the **Input Routing** pop-up menu to your microphone input bus.
3. Set the **Output Routing** pop-up menu to the output bus that is set as the Main Mix.
4. Activate **Monitor** for the mic signal track.

   NOTE

   If you use a mic signal track, set the **Auto Monitoring** mode (**File > Preferences > VST**) to **Manual**. Otherwise, select **Tapemachine Style**.

Creating Other Tracks

The other tracks are designed for recording and for playback of your recordings.

PROCEDURE

1. Create as many other audio tracks as you need.
2. In the **Inspector** of each track, set the **Input Routing** pop-up menu to your microphone bus.
3. Set the **Output Routing** pop-up menu to the output bus that is set as the Main Mix.

Creating Cue Channels

Cue channels are used for sending cue mixes, also known as headphone mixes, to performers in the studio during recording.

PROCEDURE

1. Select **Devices > VST Connections > Studio**.
2. Activate **Enable/Disable Control Room**.
3. Click **Add Channel** and add at least one cue channel.

Setting Up the ADR Environment

Setting up your ADR environment includes importing files and defining takes, assigning ADR tracks, setting up the routing, configuring video overlays, and enabling automatic record for target tracks.

Importing Files and Defining Takes

Import your files and define the takes that you want to record by creating cycle markers.

PROCEDURE

1. Select **File > Import > Video File** and navigate to the video file that you want to import.
2. Select the guide track, select **File > Import > Audio File**, and import the audio file for the dialogue that you want to replace.
3. Select the M&E track, select **File > Import > Audio File**, and import the music and effect sounds.
4. Play back the guide track and set up cycle markers for all dialogue that you want to re-record.

   NOTE

   If you have a take list from a dedicated ADR taker application or an Excel sheet, you can also import this.

Assigning ADR Tracks

You must define which of your tracks or groups correspond to a specific ADR track. This is useful for setting up the signal switchboard. The track assignment is stored with the project.

PROCEDURE

1. Select **Project > Markers**.

   The **Marker** window opens.
2. Activate **Show ADR Panel**.
3. Click **Setup**.

   The **ADR Setup** window opens.
4. Click **General**.
5. In the **ADR Track Assignment** section, use the **Guide**, **M&E**, and **Mic Signal** pop-up menus to select the tracks that you want to use as guide, M&E, and mic signal tracks.

Setting Up the Routing for Individual Mixes

You can define which signals are heard during the different ADR phases and set up different schemes for the dubbing artist and the ADR operator, for example. The routing that you set up is automatically applied when you use the ADR modes. The settings are saved globally.

PROCEDURE

1. On the **ADR** panel, click **Setup**.
2. In the **ADR Setup** window, click **Signal Switchboard**.

   The signal switchboard shows all ADR tracks (sources) for the **Control Room** (destination) in the upper section and the cues 1 to 4 (destinations) in the lower section.
3. Activate the checkboxes for the signals that you want to hear on each ADR track.

   To hear the source signal of a specific ADR track during pre-roll, activate the **Pre** option for that track. To hear the signal during the take, activate **Take**. To hear the signal during post-roll, activate **Post**.

   NOTE

   In the **MixConsole**, make sure that the Control Room and cue channels are set up correctly.

RELATED LINKS

Signal Switchboard Tab on page 343

Configuring Video Overlays

You can set up different video overlays that may be helpful for the dubbing artist.

PROCEDURE

1. On the **ADR** panel, click **Setup**.
2. Select the **General** tab and enter values for **Pre-roll** and **Post-roll**.

   NOTE

   You can set a value for **Audio Pre-Record Seconds** (**File > Preferences > Record > Audio**). The post record time corresponds to the post-roll time.
3. Select the **Video** tab.
4. In the **Video Overlays** section, configure which overlays are displayed in the **Video Player** window.
   - To enable the timecode display as an overlay in the **Video Player** window, select **Devices > Device Setup > Video Player**. In the **Video Playback** section, activate **Show Timecode**.
   - To adjust the display position, use the **Position** pop-up menu.

RELATED LINKS

General Tab on page 341

Enabling Dialogue Display in the Video Player

You can display the dialogue that must be replaced or dubbed in the **Video Player** window or on a dedicated video output device.

PREREQUISITE

The **Dialogue** attribute is assigned manually or has been imported via a CSV file.

PROCEDURE

1. In the **Marker** window, click **Set up Attribute Columns**, and activate **ADR > Dialogue**.

   The **Dialogue** column is displayed in the **Marker** window.
2. On the **ADR** panel, click **Setup**.
3. In the **ADR Setup** window, click **Video**.
4. In the **Video Overlays** section, activate **Show Dialogue during ADR**.

RESULT

The dialogue of the selected marker is shown in the **Video Player** window during rehearse, record, and review.

NOTE

You can activate **Always Show Dialogue** if you want to see the dialogue always, not only during ADR.

Enabling Automatic Record-Enabling for Target Tracks

You can automatically record-enable a track when clicking **Rehearse**, **Record**, or **Review**.

PROCEDURE

1. In the **Marker** window, click **Set up Attribute Columns**, and activate **General > Target Track**.

   The **Target Track** column is displayed in the **Marker** window.
2. On the **ADR** panel, click **Setup**.
3. In the **ADR Setup** window, click **General**.
4. In the **Recording** section, activate **Record-Enable Target Track**.

RESULT

You can now use the **Target Track** column of the **Marker** window to type in the number of the track. If you have imported this attribute with the take list, it is shown automatically.

NOTE

Only numbers are allowed as values for the target track attribute.

Rehearsing Takes

PREREQUISITE

Define takes by creating cycle markers and set up the **Signal Switchboard** as required.

PROCEDURE

1. In the markers list, select the marker for the take that you want to record.
2. On the **ADR** panel, click **Rehearse**.

Switching from Rehearse to Record

You can switch from **Rehearse** to **Record** without stopping playback. This is useful, if you realize during rehearsing that you want to record straight away.

PREREQUISITE

You are rehearsing a take.

PROCEDURE

- On the **ADR** panel, click **Record**.
  - If you click **Record** during the pre-roll phase, playback continues and recording starts only at the take start position.
  - If you click **Record** during the take phase, recording starts directly at the cursor position.

Recording Takes

PREREQUISITE

The dubbing artist has rehearsed the take and is ready to record. You have record-enabled the track on which you want to record.

NOTE

To combine track selection and record-enabling, select **File > Preferences > Editing > Project & MixConsole** and activate **Enable Record on Selected Audio Track**.

PROCEDURE

- On the **ADR** panel, click **Record**.

RESULT

The take is recorded.

Reviewing Takes

PROCEDURE

- On the **ADR** panel, click **Review**.

RESULT

The take is played back so that the director and the artist can review it.

NOTE

If you cannot hear the recorded take, open the **Signal Switchboard** tab and make sure that **Take** is activated in **Review** mode for **Other Audio** for the **Control Room** and **Cue 1**.

AFTER COMPLETING THIS TASK

If you are satisfied with the recording, proceed with the next take.

NOTE

You can select the next marker in the marker list by clicking **Locate Next Marker in Marker Window**. If **Sync Selection** is activated in the **Marker Preferences**, the corresponding take is also selected in the **Project** window. Make sure that **Track Selection Follows Event Selection** is deactivated (**File > Preferences > Editing**).

MixConsole

The **MixConsole** provides a common environment for producing mixes in stereo or surround. It allows you to control level, pan, solo/mute status, etc. for audio and MIDI channels. Furthermore, it is a convenient environment for setting up the input and output routing for multiple tracks or channels at the same time.

To open the **MixConsole**, you have the following options:

- Press [F3].
- Select **Devices > MixConsole**.
- On the **Project** window toolbar, click **Open MixConsole** .

  This is only visible on the toolbar if the section **Media & MixConsole Windows** is activated.

The **MixConsole** is divided into several sections:

1) **Channel Selector**

Allows you to set up the visibility and positions of channels in the fader section.

2) **Fader Section**

The fader section is the heart of the **MixConsole**. It is always visible and shows all channels in the same order as in the track list.

3) **Channel Overview**

Displays all channels as boxes. If you have more channels than can be displayed in the window, you can use the channel overview to navigate to other channels and select them.

4) **Meter Bridge**

Allows you to monitor the levels of your channels.

5) **Equalizer Curve**

Allows you to draw an EQ curve. Click in the curve display to open a larger view where you can edit the curve points.

6) **Channel Racks**

Allows you to show additional channel controls as needed.

7) **Pictures**

Opens the **Pictures** section that allows you to add a picture to the selected channel. Pictures can help you identify your **MixConsole** channels quickly.

8) **Notepad**

In the **Notepad** section, you can enter notes and comments about a channel. Each channel has its own notepad.

9) **Control Room/Meter**

Opens the **Control Room/Meters** section.

RELATED LINKS

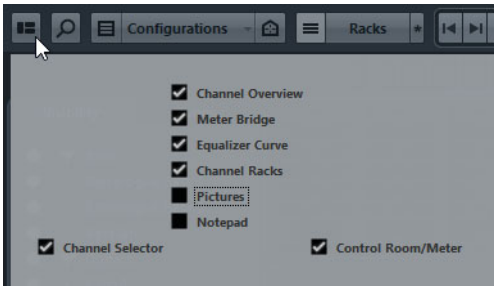
Track Pictures Browser on page 145

Setting Up the MixConsole

You can show and hide the different sections of the **MixConsole**. This saves screen space and enables you to display only the information that you need.

PROCEDURE

1. Click the **Set up Window Layout** button on the **MixConsole** toolbar.
2. Activate the checkboxes for the sections that you want to show.



MixConsole Toolbar

The toolbar holds tools and shortcuts for settings and functions in the **MixConsole**.

Set up Window Layout

Allows you to activate/deactivate the different sections of the **MixConsole**.

Find Track/Channel

Opens a selector that lists all tracks/channels.

Filter Channel Types

Opens the channel filter that allows you to show/hide all channels of a certain channel type.

Channel Visibility Configurations

Allows you to create configurations that are useful for switching quickly between different visibility setups.

Channel Visibility Agents

Allows you to select channels with specific properties.

Show/Hide Channel Racks

Activates/Deactivates the rack selector.

Select Racks

Opens the rack selector that allows you to show/hide specific racks.

Rack Settings

Opens a pop-up menu with settings for the racks.

Locators

Shows the left and right locator positions.

Transport Buttons

Shows the transport controls.

Time Display

Shows the time display.

Markers

Shows the marker buttons.

State Buttons

Shows the mute, solo, listen, and automation states. Here you can also bypass inserts, EQs, channel strips, and sends.

Link Group

Allows you to link channels.

Zoom Palette

Allows you to increase/reduce the channel width and the rack height. You can change the width for all channels from viewable (narrow) to editable (wide), by using the default key commands [G] and [H].

Performance Meter

Shows the meters for ASIO time usage and hard disk transfer load.

Functions Menu

Opens the **Functions Menu**, that allows you to make settings in the **MixConsole**.

Functions Menu

The **Functions** menu holds tools and shortcuts for settings and functions in the **MixConsole**.

- To open the **Functions Menu**, click the **Functions Menu** button in the top right corner of the **MixConsole**.

Scroll to Selected Channel

If this option is activated and you select a channel in the **Visibility** tab, the selected channel is automatically displayed in the **Fader** section.

Copy First Selected Channel's Settings

Copies the settings of the first selected channel.

Paste Settings to Selected Channels

Pastes the settings to the selected channels.

Zoom

Opens a submenu where you can increase or reduce the channel width and the rack height.

Open VST Connections

Opens the **VST Connections** window.

Control Room Cue Channels

Opens a submenu where you can activate/deactivate cue channels and change level and panning settings.

Constrain Delay Compensation

Allows you to activate/deactivate the **Constrain Delay Compensation** that keeps all channels in perfect sync and automatically compensates any delay inherent in VST plug-ins during playback.

Direct Routing: Summing Mode On/Off

Allows you to feed your signals to several outputs at the same time.

After Fader Listen Mode

Allows you to enable/disable that the signal of a listen-enabled channel is routed to the **MixConsole** channel after applying the fader and pan settings.

EQ/Filter Transition

Allows you to change the **EQ/Filter Transition** mode from **Soft** to **Quick**.

Save Selected Channels

Saves the settings for the selected channels.

Load Selected Channels

Loads the settings for the selected channels.

Global Meter Settings

Opens a submenu where you can set up the global meter settings.

Reset MixConsole Channels

Allows you to reset EQ, insert, and send effect settings for all or selected channels. Solo and mute buttons are deactivated, the volume fader is set to 0 dB, and pan is set to the center position.

Link MixConsoles

If you opened more than one **MixConsole**, you can link them.

Saving MixConsole Settings

You can save **MixConsole** settings for selected audio-related channels in the **MixConsole** and load them into any project.

PROCEDURE

1. Select the channels with the settings that you want to save.
2. Select **Functions > Save Selected Channels**.
3. In the file dialog, specify the file name and location.
4. Click **Save**.

RESULT

The settings for the selected channels are saved with the file extension `.vmx`. The input/output routing is not saved.

Loading MixConsole Settings

You can load **MixConsole** settings that have been saved for selected channels.

PROCEDURE

1. Select the same number of channels that you selected when you saved your **MixConsole** settings.

   The loaded **MixConsole** settings are applied in the same order as originally saved. For example, if you have saved the settings for channels 4, 6, and 8, and apply these

settings to channels 1, 2, and 3, the settings saved for channel 4 are applied to channel 1, the settings saved for channel 6 to channel 2, and so on.

2. Select **Functions > Load Selected Channels**.
3. In the **Load Selected Channels** dialog, select the `.vmx` settings file and click **Open**.

RESULT

The channel settings are applied to the selected channels.

NOTE

When you apply loaded **MixConsole** settings to fewer channels, some of the saved settings are not applied. Since the saved settings are applied from left to right as shown in the **MixConsole**, the settings for the channels furthest to the right are not applied to any channels.

Configuring the MixConsole

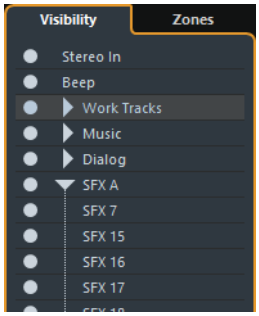
You can configure the **MixConsole** exactly to your needs and to your individual workflow.

Channel Selector

The channel selector contains the **Visibility** tab and the **Zones** tab. These tabs list all channels contained in your project.

Visibility Tab

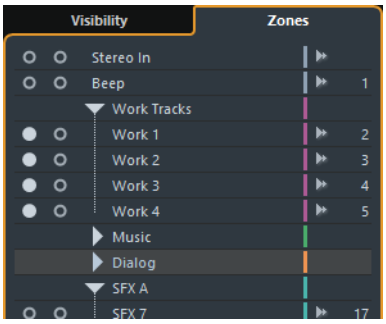
The **Visibility** tab allows you to determine which channels are shown in the **MixConsole**. This is particularly helpful if you organize your tracks in folder or group tracks.



- To show/hide channels, activate/deactivate the dots.
- To collapse/expand groups and folders, click the group or folder name.

Zones Tab

The **Zones** tab allows you to determine and lock the position of certain channels.



- To lock channels on the left/right of the fader section, activate the left/right dots next to the channel names.

  Locked channels are excluded from scrolling and are always visible.

Input Routing Configurations for Mono Channels

- Mono input busses or individual channels within a stereo or surround input bus.
- External inputs configured on the **Studio** tab of the **VST Connections** window.

  These can be mono or individual channels within a stereo or surround bus. They can also be routed to the **Talkback** input.
- Mono output busses, mono group output busses, or mono FX channel output busses.

  These should not lead to feedback.

RELATED LINKS

Routing on page 383

Input Routing Configurations for Stereo Channels

- Mono or stereo input busses or stereo child busses within a surround bus.
- External inputs that are configured on the **Studio** tab of the **VST Connections** window.

  These can be mono input busses or stereo input busses. They can also be routed to the **Talkback** input.
- Mono or stereo output busses, mono or stereo group output busses, and mono or stereo FX channel output busses.

  These should not lead to feedback.

RELATED LINKS

Routing on page 383

Input Routing Configurations for Surround Channels

- Surround input busses.
- External inputs that are configured on the **Studio** tab of the **VST Connections** window.

  These must have the same input configuration.
- Output busses.

  These must have the same input configuration and should not lead to feedback.

RELATED LINKS

Routing on page 383

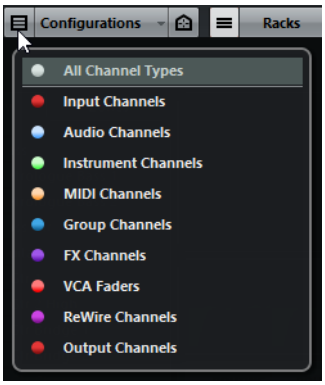
Filtering Channel Types

The channel types filter on the **MixConsole** toolbar allows you to determine which channel types are shown.

PROCEDURE

1. Click **Filter Channel Types**.

   This opens the channel types filter.



2. Click a dot to the left of a channel type to hide it.

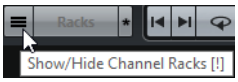
RESULT

Channels of the filtered type are removed from the fader section and the color of the **Filter Channel Types** button changes to indicate that a channel type is hidden.

Rack Selector

The rack selector allows you to activate specific **MixConsole** functions, such as routing, insert, or send handling, that are organized in racks.

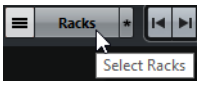
- To activate the rack selector, activate **Show Channel Racks**.



Channel Racks

You can activate and deactivate the different channel racks in the **MixConsole**.

- To open the **Select Racks** pop-up menu, click **Select Racks**.



Depending on the channel type, you can activate/deactivate the following racks:

Hardware

Allows you to control your audio hardware effects. This rack is only available if supported by your hardware.

Routing

Allows you to set up the input and output routing. For MIDI, you can also select the MIDI channel.

Pre (Filters/Gain/Phase)

Contains input filter and gain controls along with **Phase** and **Gain** controls for audio-related channels or an **Input Transformer** control for MIDI channels.

Inserts

Allows you to select insert effects for your channel.

Equalizers (audio-related channels only)

Allows you to set the channel EQ.

Channel Strip (audio-related channels only)

Allows you to integrate channel strip modules, such as Gate, Compressor, EQ, Transformer, Saturator, and Limiter that allow you to enhance your sound.

Sends

Allows you to select send effects for your channel.

Cue Sends (audio-related channels only)

Allows you to activate and control the level and pan for up to 4 cue sends.

Direct Routing

Allows you to set and activate outputs for all selected channels at once.

Track Quick Controls

Allows you to add quick controls for instant access.

Device Panels

Allows you to view the available device panels.

VCA

Allows you to view and set connections to VCA faders.

Rack Settings

The **Rack Settings** pop-up menu allows you to make settings for the racks.

- To open the **Rack Settings** pop-up menu, click *****.

Exclusive Expanded Rack

Shows the selected rack exclusively and collapses the other racks.

Fixed Number of Slots

Shows all available slots for the **Inserts**, **Sends**, **Cues**, and **Quick Controls** racks.

Link Racks to Configurations

If activated, the rack status is taken into account when you save and load a configuration.

Show Pre/Filters as <Combined Label & Setting>

Select **Combined Label & Setting**, if you want to show the label and the setting in one line.

Select **Separate Label & Setting**, if you want to show the label and the setting in separate lines.

Show Inserts as <Plug-in & Preset Names>

Select **Plug-in Names**, if you want to show the plug-in names only.

Select **Plug-in & Preset Names**, if you want to show the plug-in and the preset names.

Show All Channel Strip Controls

Shows all available controls on the **Channel Strip** rack.

Show One Channel Strip Type

Shows only one channel strip type at a time.

Show Sends as <Combined Destination & Gain>

Select **Combined Destination & Gain**, if you want to show the destination and the gain in one line.

Select **Separate Destination & Gain**, if you want to show the destination and the gain in separate lines.

Show Quick Controls as <Combined Destination & Value>

Select **Combined Destination & Value**, if you want to show the destination and the value in one line.

Select **Separate Destination & Value**, if you want to show the destination and the value in separate lines.

Channel Visibility Configurations

The **Channel Visibility Configurations** button on the **MixConsole** toolbar allows you to create configurations that are useful for switching quickly between different visibility setups.

The button displays the name of the active configuration. A list of configurations is shown as soon as you create at least one configuration. To load a configuration, select it from this list. Channel visibility configurations are saved with the project.

Add Configuration

Opens the **Add Configuration** dialog that allows you to save the configuration and enter a name for it.

Update Configuration

If you change the active configuration, this is indicated by an asterisk after the configuration name. Use this function to save changes to the active configuration.

Rename Configuration

Opens the **Rename Configuration** dialog that allows you to rename the active configuration.

Delete Configuration

Allows you to delete the active configuration.

Move Configuration to Position

This function becomes available if 2 or more configurations exist. It allows you to change the position of the active configuration on the menu. This is useful as you can assign key commands to the first 8 configurations in the **Channel & Track Visibility** category of the **Key Commands** dialog.

Saving Configurations

To quickly switch between different channel setups, you can save configurations. The configurations contain visibility and zone settings as well as the show/hide status of channel types and racks.

PROCEDURE

1. Set up the configuration that you want to save.
2. On the toolbar, click **Configurations**.
3. From the pop-up menu, select **Add Configuration**.

4. In the **Add Configuration** dialog, enter a name for the configuration.
5. Click **OK**.

RESULT

The configuration is saved and you can return to it at any time.

Channel Visibility Agents

Channel visibility agents allow you to show or hide all channels, selected channels, or channels with certain properties.

To open the **Channel Visibility Agents** pop-up menu, do one of the following:

- Click the **Channel Visibility Agents** button on the toolbar.
- In the **Channel Selector**, open the **Visibility** tab and right-click to open the context menu.

Showing Channels with Specific Properties

- To open the **Channel Visibility Agents** pop-up menu, click the **Channel Visibility Agents** button in the toolbar.

Show all Channels

Shows all channels of your project.

Show Only Selected Channels

Shows only channels that are selected.

Hide Selected Channels

Hides all channels that are selected.

Show Channels for Tracks with Data

Shows all channels for tracks with events or parts.

Show Channels for Tracks with Data at the Cursor Position

Shows all channels for tracks with events or parts at the cursor position.

Show Channels for Tracks with Data between the Locators

Shows all channels for tracks with events or parts between the locators.

Show Channels that are Connected to the First Selected Channel

Shows all channels that are connected to the channel you first selected.

NOTE

You can assign key commands for the channel visibility agents in the **Channel & Track Visibility** category of the **Key Commands** dialog.

Undoing/Redoing Visibility Changes

You can undo/redo up to 10 visibility changes.

PROCEDURE

1. In the **MixConsole** toolbar, click the **Channel Visibility Agents** button.
2. Select **Undo Visibility Change** or **Redo Visibility Change**.

Synchronizing Channel and Track Visibility

You can synchronize the channel visibility in the **MixConsole** with the track visibility in the **Project** window.

PROCEDURE

1. In the **Channel Selector**, open the **Visibility** tab and move the mouse to the right of the label.
2. Click the dot to open the **Sync Track/Channel Visibility** menu.
3. Select **Sync MixConsole and Project** to synchronize the channel visibility with the track visibility.

RESULT

The dot in the **Visibility** tab changes to indicate that the track and channel visibility are synchronized.

NOTE

Channels in the left or right zones of the **MixConsole** are not synchronized.

RELATED LINKS

Synchronizing Track and Channel Visibility on page 55

Finding Channels

The **Find Track/Channel** function allows you to find specific channels. This is useful if you have a large project with many channels or if you have hidden channels using the visibility features.

PROCEDURE

1. Click **Find Track/Channel** in the **MixConsole** toolbar to open a selector that lists all channels.
2. In the search field, enter the name of the channel.

   As you type, the selector filters automatically.
3. In the selector, select the channel and press [Return].

RESULT

The channel is selected in the channel list.

NOTE

If the channel was outside the view or hidden, it is now shown. Channels that are hidden using **Filter Channel Types** are not shown.

Linking Channels

You can link selected channels in the **MixConsole** to form a link group. Any change that is applied to one channel is mirrored by all linked channels, depending on which settings are activated in the link group settings.

The **Link Group** options on the **MixConsole** toolbar allow you to link channels and to edit links and linking configuration.

Link Group options in Nuendo toolbar.

Display Line

Whenever you create a link group, a display line is added on top of the fader section in the **MixConsole**.

The display line shows the number and the name of the created link group and provides a pop-up menu that allows you to edit the link group settings.

On the display line, you can change the name of the link group by double-clicking and entering a different name. If you hold down a modifier key and double-click the name, the **Link Group Settings** dialog opens.

The pop-up menu provides the following options:

Unlink Selected Channels

Only available for a selected link group. Select this option to remove the link between the channels. This removes the link group.

Edit Link Group Settings

Allows you to change the link group settings.

Included in Link Group: <name of link group>

Shows the link group to which the selected channel belongs. You can assign the selected channel to a different link group. This removes the channel from the current group. If you only want to remove the selected channel from the link group, select **None**.

Linked Channels

Shows which channels are linked in the link group.

RELATED LINKS

Changing the Link Group Settings on page 367
Adding Channels to Link Groups on page 367
Removing Channels from Link Groups on page 368
VCA Faders on page 368

Creating Link Groups

You can link several channels to form a link group.

PROCEDURE

1. Select the channels that you want to link.
2. On the **MixConsole** toolbar, click **Link**.
3. In the **Link Group Settings** dialog, activate the parameters that you want to link.
4. Click **OK**.

RESULT

The number and name of the link group is indicated above the channel name in the display line.

NOTE

If you link groups, insert and channel strip module linking is applied at the slot level. For example, if you change the settings for insert slot 3 on one channel, these changes are also applied to slot 3 on the other channels. Insert effects in other slots remain unaffected.

Changing the Link Group Settings

If you change a setting for a channel of the link group, the change is applied to the whole group.

- To change the link settings for an existing link group, select the group, on the **MixConsole** toolbar, click **Edit Link Group Settings**, and change the settings in the **Link Group Settings** dialog.
- To unlink channels, select one of the linked channels and click **Link** on the **MixConsole** toolbar.
- To make individual settings and changes for a channel in a link group, activate **Sus** on the **MixConsole** toolbar or press [Alt]/[Option].
- To make absolute instead of relative value changes, activate **Abs** on the **MixConsole** toolbar.

NOTE

The automation tracks for linked channels are not affected by the **Link** function.

Adding Channels to Link Groups

You can add a channel to an existing link group.

PROCEDURE

1. On the display line of the channel that you want to add, open the pop-up menu.
2. Select **Included in Link Group: <None>** and select the link group.

RESULT

The channel is added to the link group.

Removing Channels from Link Groups

You can remove a channel from an existing link group.

PROCEDURE

1. On the display line of the channel that you want to remove, open the pop-up menu.
2. Select **Included in Link Group: <link group name>** and from the link group list, select **None**.

RESULT

The channel is removed from the link group.

Using Quick Link

You can activate the **Temporary Link Mode** to synchronize all touched parameters of selected channels.

PROCEDURE

1. Select the channels that you want to link.
2. On the **MixConsole** toolbar, activate **Q-Link**.

   NOTE

   You can also press [Shift]-[Alt]/[Option] to temporarily link channels. In that case, the link is only active as long as you press the keys.

3. Change the parameters for one of the selected channels.

RESULT

The changes are applied to all selected channels until you deactivate **Q-Link**.

VCA Faders

VCA faders serve as remote controls for channel faders in the **MixConsole**.

VCA stands for Voltage-Controlled Amplifier. VCA faders were originally found on hardware mixing desks. They allowed the user to control the volume levels of several mixer channels with only one fader. To assign channel faders to a VCA fader, the respective channels must be physically connected with the VCA fader.

In Nuendo, the VCA fader function is based on the same concept. VCA faders can be connected with different types of audio-related channels. This allows the VCA faders to control the volume of the connected channels. A channel can be connected to only one VCA fader.

From a technical perspective, moving a VCA fader to a different dB level adds or subtracts the new value to or from the original values of the connected channels.

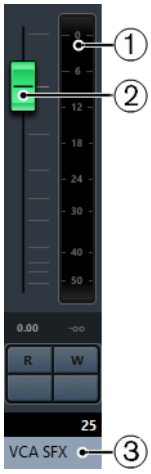
EXAMPLE

A channel has a level of -6 dB, the VCA fader is at the 0 position. If you move the VCA fader to a level of +3 dB, this value is added to the level of the connected channel. The connected channel now has a level of -3 dB.

VCA Fader Settings

VCA fader channels are different from the default fader channels.

VCA faders have no panner. Their fader caps have a color different from the other fader channels. If you change the name and the color of the VCA fader, this is reflected in the connected channels on the VCA rack.



1) Peak meter that displays the summed up level of the meters of all connected channels
2) Fader cap
3) Fader name and color

The VCA fader context menu provides the following options:

Disconnect All

Disconnects the VCA fader from all connected channels.

Combine Automation of VCA and Connected Channels

Combines the automation of VCA fader and connected channels. This has the effect that the original automation settings of the connected channels are replaced by the combined automation and that the automation of the VCA fader is reset to its original position. In the **Project** window, the automation curve of the VCA fader is reset to the static value line. In the **MixConsole**, the VCA fader is reset to the 0 position.

RELATED LINKS

VCA Fader Automation on page 371

Creating VCA Faders

You can create VCA faders in several ways.

VCA faders can be created in the **MixConsole** and in the **Project** window.

In the **MixConsole**, you have the following options:

- You can create unassigned VCA faders in the fader section. They are placed at the right end of the fader section in front of the output channels. You can connect the VCA faders to channels using the **VCA** rack at a later stage.To create unassigned VCA faders in the **MixConsole**, right-click in the fader section and select **Add VCA Fader**.
- You can create VCA faders and automatically connect them to selected channels.

In the **Project** window, you can create VCA fader tracks in the track list. The VCA faders are placed in a **VCA Tracks** folder at the end of the track list. The VCA faders can be connected to channels using the **VCA** rack in the **MixConsole** at a later stage.

NOTE

You can delete VCA faders only in the **Project** window.

RELATED LINKS

VCA on page 407
Creating VCA Faders for a Selection of Channels on page 370
VCA Fader Track on page 133
Adding Tracks on page 142

Creating VCA Faders for a Selection of Channels

You can select several channels and automatically create and connect a VCA fader.

NOTE

You can also connect VCA faders to a selection of channels using the **VCA** rack.

PROCEDURE

1. Select several channels in the **MixConsole**.
2. Right-click one of the selected channels.
3. In the context menu, select **Add VCA Fader to Selected Channels**.

RESULT

A VCA fader is created and placed to the right of the selected faders. In the **Project** window, the VCA track is placed below the selected tracks.

RELATED LINKS

Connecting Several Channels with VCA Faders on page 408

Nested VCA Faders

VCA faders can control other VCA faders.

If you use several VCA faders that control different channels, you can create another VCA fader that controls the VCA faders. This allows you to control the volume level of more than one selection of connected channels at the same time.

Technically, a VCA fader that controls other VCA faders affects the volume level of all VCA faders and all connected channels.

EXAMPLE

A VCA fader (main fader) controls a nested VCA fader that has been set to -10 dB. The latter VCA fader controls a connected channel that had an original level of -3 dB and that is currently set to -13 dB. If you change the main fader level from 0 to +4 dB, the controlled VCA fader is set to a level of -6 dB, and the connected channel is set to a level of -9 dB.

VCA Fader Automation

VCA fader automation affects the volume automation of the connected channels.

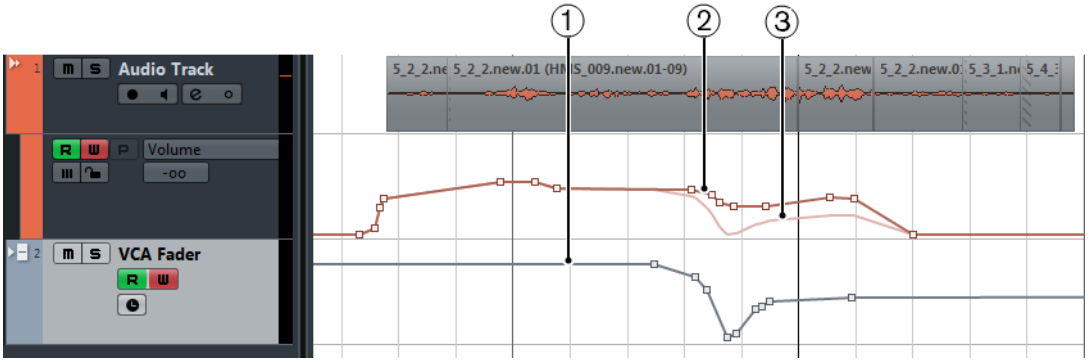
VCA faders have their own, independent automation track. Whenever you write automation for a VCA fader, it affects the volume automation of the connected channels. The automation of the connected channels and the VCA fader are combined, which you can hear and see. On the automation tracks of the connected channels, this is visualized as follows:

- If the VCA fader and its connected channel have volume automation, the VCA fader automation influences the existing volume automation of the connected channel. The automation tracks show the original automation and the combined automation of VCA fader and its connected channels.

- If the VCA fader and its connected channels have volume automation and you select **Combine Automation of VCA and Connected Channel** in the context menu of the VCA fader, the automation of the connected channels takes over the combined automation. The automation of the VCA fader is reset to its default position. The automation tracks of the connected channels show the combined automation. The automation tracks of the VCA fader show the default static value line.

EXAMPLE

The following illustration shows how the VCA fader automation affects the automation of the connected channels.



1) Automation curve of the VCA fader
2) Automation curve of the connected channel
3) Combined automation of VCA fader and connected channel. This is what you hear.

RELATED LINKS

VCA Fader Settings on page 369

Metering

The **MixConsole** features a master meter and a loudness meter that can be shown to the right of the fader section.

Displaying Meters

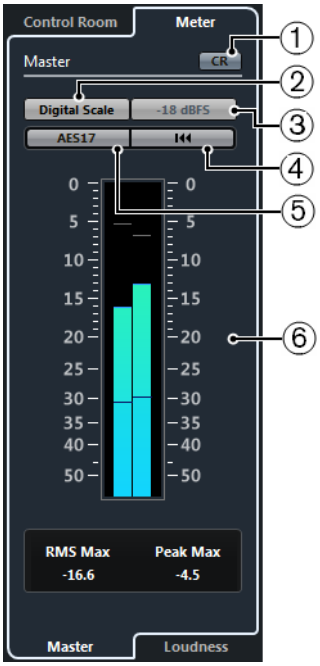
PROCEDURE

1. In the **MixConsole**, click the **Set up Window Layout** button on the toolbar and activate **Control Room/Meter**.
2. Click the **Meter** tab at the top of the **Control Room/Meter** section.

   By default, the master meter is displayed.

Master Meter

The master meter is a multi-channel true peak meter.



1) **Control Room view**

   Activates the **Control Room** section in the **MixConsole**.

2) **Scales**

   Lets you select a scale according to different broadcast standards (Digital, DIN, EBU, British, Nordic, K-20, K-14, or K-12). The headroom is indicated by red lines in the meter scale.

3) **Alignment level standards**

Lets you select an alignment level (offset) for your scale. This is unavailable for digital and K-System scales. The broadcast meter scales DIN, EBU, Nordic, and British have a default alignment level of -18 dBFS.

4) **Reset RMS and PPM Max**

Resets the measurement.

5) **AES17 standard**

Activates the AES17 standard that adds an offset of 3 dB to the RMS value.

6) **RMS/Peak meter**

Shows the RMS and peak hold values as blue lines and the peak values as gray lines.

The following parameters are available:

RMS Max

Shows the maximum RMS value.

Peak Max

Shows the maximum peak value.

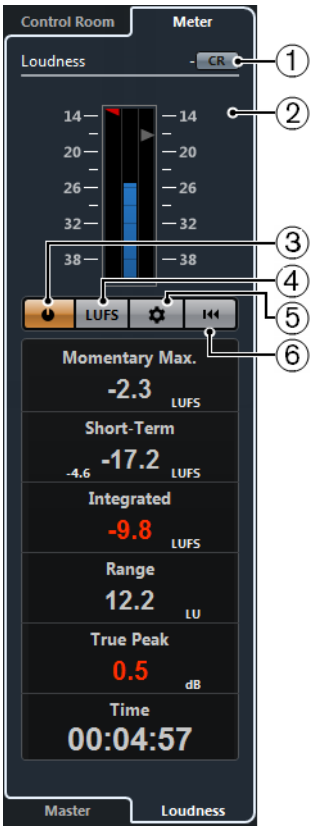
RELATED LINKS

Control Room on page 414

Loudness Meter

The loudness meter complies to the loudness recommendation R 128 of the European Broadcasting Union (EBU). Measurements that correspond to this recommendation consider loudness, loudness range, and maximum true peak level values. Loudness is measured in LUFS (Loudness Unit, referenced to Full Scale) or LU.

- To activate the loudness meter, click the **Loudness** tab at the bottom of the meter display.



1) **Control Room view**

Activates the **Control Room** section in the **MixConsole**.

2) **Loudness meter**

Shows the **Momentary Max** value as a green triangle in the left meter scale and the **Integrated** value as a gray triangle in the right meter scale.

3) **Measure Loudness**

Activates the loudness measurement.

4) **Switch between LUFS and LU**

Switches the meter scale between LUFS (absolute values) and LU (relative values).

5) **Configure Loudness Settings**

Lets you specify a threshold value for the **Short-Term**, the **Integrated**, and the **True Peak** clipping indicators. If values above the set thresholds are detected, the corresponding indicators turn red.

To reset all values on playback start, activate the **Reset on Start** option.

6) **Reset Loudness**

Resets all loudness values.

The following parameters are available:

Momentary Max

Shows the maximum loudness measured over a duration of 400 ms.

Short Term

Shows the loudness measured over a duration of 3 ms.

Integrated

Shows the average loudness measured from start to stop. The period of measurement is shown in the **Time** display. The recommended value for the integrated loudness is -23 LUFS. This absolute value is the reference point for the relative LU scale where -23 LUFS equals 0 LU.

Range

Shows the dynamic range of the audio measured from start to stop. This value helps you to decide how much dynamic compression you can apply. The range that is recommended for highly dynamic audio such as film music is 20 LU.

True Peak

Shows the true peak level of the audio. The maximum permitted true peak level in production is -1 dB.

Time

Shows the duration of integrated loudness measurement.

RELATED LINKS

Control Room on page 414

Input Levels

When recording digital sound, it is important to set the input levels high enough to ensure low noise and high audio quality. At the same time, you must avoid clipping (digital distortion).

Setting Input Levels

PROCEDURE

1. Click **Filter Channel Types** and activate **Input Channels**.

   In this mode, the input channel level meters show the level of the signal at the input of the bus, before any adjustments, such as input gain, EQ, effects, level, or pan are made. This allows you to check the level of the unprocessed signal coming into the audio hardware.

2. Select **Functions > Global Meter Settings > Meter Position** and activate **Input**.

3. Play back the audio and check the level meter for the input channel.

   The signal should be as loud as possible without exceeding 0 dB that is the clipping indicator for the input bus should not light up.

4. If necessary, adjust the input level in one of the following ways:
   - Adjust the output level of the sound source or the external mixer.
   - If possible, use the audio hardware's own application program to set the input levels. See the documentation for the audio hardware.
   - If your audio hardware supports the ASIO control panel function, it may be possible to make input level settings. To open the ASIO control panel, select **Devices > Device Setup** and in the list to the left (below **VST Audio System**), select your audio card. When this is selected, you can open the control panel by clicking the **Control Panel** button in the settings section to the right.

5. Optional: Select **Functions > Global Meter Settings > Meter Position** and activate **Post-Fader**.

   NOTE

   This allows you to check the level of the audio being written to a file on your hard disk which is only necessary if you make any adjustments to the input channel.

6. In the **Channel Racks** section, in the **Inserts** rack, click a slot and select an effect, or in the **Equalizers** rack, make your EQ settings.

   For some effects you may want to adjust the level of the signal going into the effect. Use the input gain function for this. Press [Shift] or [Alt]/[Option] to adjust the input gain.

7. Play back the audio and check the level meter of the input channel.

   The signal should be reasonably loud without exceeding 0 dB that is the clipping indicator for the input bus should not light up.

8. If necessary, use the input channel fader to adjust the signal level.

Clipping

Clipping typically occurs in the audio hardware when an analog signal is too loud and therefore converted to digital in the hardware's A/D converters.

Clipping can also occur when the signal from the input bus is written to a file on your hard disk. The reason for this is that you can make settings for the input bus, adding EQ, effects, etc. to the signal while it is being recorded. This may raise the level of the signal, which causes clipping in the recorded audio file.

Copying and Moving Rack and Channel Settings

You can use drag and drop to copy or move rack and channel settings.

Drag and drop works between different channels or different rack slots on the same channel. When you drag, a blue frame indicates the sections where you can drop your settings.

The following applies:

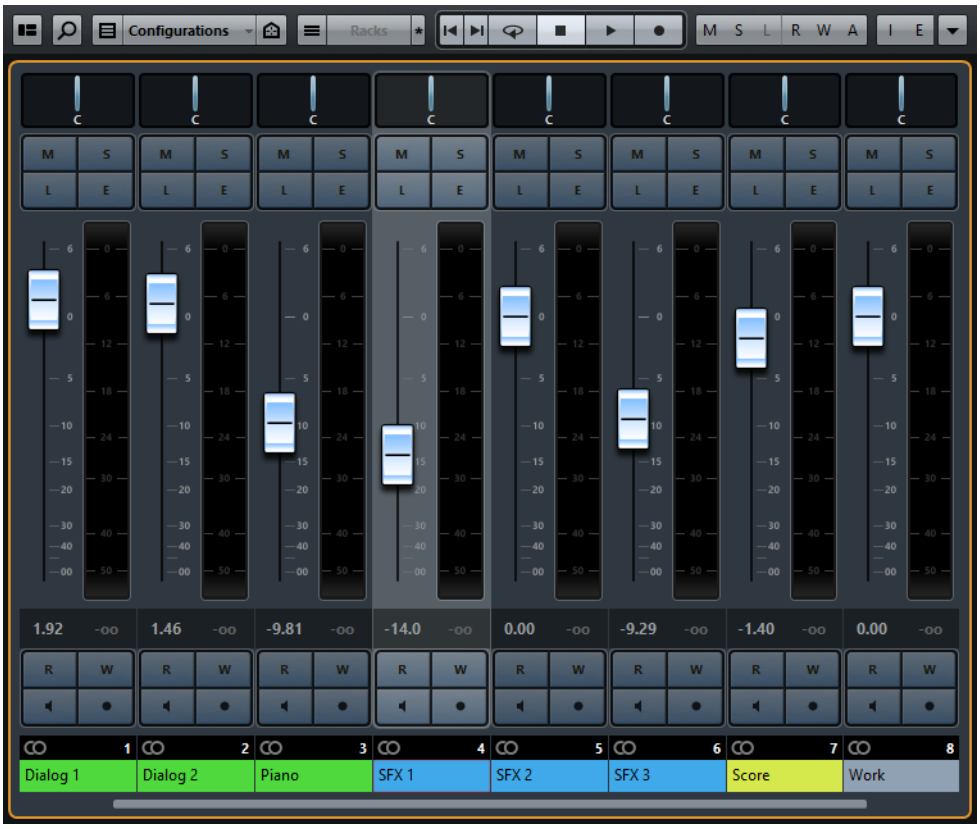
- To copy the rack settings from one rack to another, drag the rack and drop it on the rack to which you want to copy the settings.
- To move the rack settings from one rack to another, press [Alt]/[Option], drag the rack, and drop it on the rack to which you want to move the settings.
- To copy the channel settings from one channel to another, drag the channel and drop it on the channel to which you want to copy the settings.

You can copy rack and channel settings between different types of channels, provided that the target channels have corresponding settings.

- For example, copying from input/output channels leaves the sends settings in the target channel unaffected.
- For projects with surround sound, any insert effects that are routed to surround speaker channels become muted when the settings are pasted to a mono or stereo channel.

Fader Section

The fader section is the heart of the **MixConsole**. It shows input and output channels together with audio, instrument, MIDI, group, FX, VCA fader, and ReWire channels that appear in the same order as in the track list.



NOTE

If a channel is deactivated in the channel selector or if its channel type is deactivated, it is not shown in the fader section.

The fader section allows you to do the following:

- Edit link group settings
- Set the panorama
- Activate mute and solo
- Enable Listen mode
- Open the channel settings
- Set the volume
- Enable automation

RELATED LINKS

Changing the Link Group Settings on page 367
Using Channel Settings on page 409
Write/Read Automation on page 659

Setting Pan

For each audio-related channel with at least a stereo output configuration, you can find a pan control at the top of the fader section. For MIDI channels, the pan control sends out MIDI pan messages. The result depends on how your MIDI instrument is set to respond to pan.

The pan control allows you to position a channel in the stereo spectrum. This control is different for stereo and surround configurations. Channels with a multi-channel output configuration feature a miniature SurroundPanner control.

- To make fine adjustments, hold down [Shift] when you move the pan control.
- To select the default center pan position, hold down [Ctrl]/[Command], and click the pan control.
- To edit the value numerically, double-click the pan control.

RELATED LINKS

Creating New Projects on page 69
Surround Sound on page 637

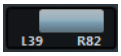
Stereo Balance Panner

The stereo balance panner allows you to control the balance between the left and right channels. It is activated by default.

Stereo Combined Panner

With the stereo combined panner, the left and right pan controls are linked and keep their relative distance if you move them. It is available for channels with a stereo input and output configuration.

- To activate this panner, open the context menu for a pan control and select **Stereo Combined Panner**.

- To set the pan independently for the left and right channels, hold down [Alt]/[Option] and drag left or right.
- To reverse the left and right channels, pan the left channel to the right and the right to the left.

  The area between the pan controls changes the color to indicate that the channels are reversed.

- To sum two channels, set them to the same pan position (mono).

  Note that this increases the volume of the signal.

- To specify the default stereo panner mode for new audio tracks, select **File > Preferences > VST**.

Panning Bypass

You can bypass the panning for all audio-related channels.

- To activate panning bypass, click the button to the left or press [Ctrl]/[Command]-[Alt]/[Option]-[Shift] and click the pan control.
- To deactivate panning bypass, press [Ctrl]/[Command]-[Alt]/[Option]-[Shift] and click again.

When panning is bypassed for a channel, the following happens:

- Mono channels are panned center.
- Stereo channels are panned hard left and right.
- Surround channels are panned center.

Using Solo and Mute

You can silence one or several channels using the **Solo** and **Mute** buttons.

- To silence a channel, click **Mute**.

  Click again to deactivate the mute state for the channel.

- To mute all other channels, click **Solo** for a channel.

  Click again to deactivate the solo state.

- To deactivate the mute or solo states for all channels simultaneously, click **Deactivate All Mute States** or **Deactivate All Solo States**.

- To activate exclusive solo mode, hold down [Ctrl]/[Command] and click **Solo** for the channel.

  The **Solo** buttons of all other channels are deactivated.

- To activate solo defeat for a channel, [Alt]/[Option]-click **Solo**.

  You can also click and hold **Solo** to activate solo defeat. In this mode the channel is not muted when you solo another channel. [Alt]/[Option]-click again to deactivate solo defeat.

Listen Mode

The listen mode allows you to quickly check the signal that is coming from selected channels without interrupting and interfering with the actual mix. During a recording session it allows the sound engineer in the control room to attenuate the signal that is coming from one of the musicians while the recording continues undisturbed, for example.

NOTE

To enable the listen mode, you need to enable the **Control Room**.

- To enable the listen mode, click the **Listen** button for a channel.

  This routes the channel to the **Control Room** without interrupting the signal flow.

- To turn off listen mode for all channels simultaneously, click **Deactivate all Listen States** on the **MixConsole** toolbar.

Setting Volume

Each channel in the fader section of the **MixConsole** has a volume fader. The fader levels are displayed below the fader, in dB for audio-related channels and as MIDI volume (0 to 127) for MIDI channels.

- To change the volume, move the fader up or down.
- To make fine volume adjustments, press [Shift] while moving the faders.
- To reset the volume on its default value, press [Ctrl]/[Command] and click a fader.

For audio channels, the volume fader controls the volume of the channel before it is routed to an output bus, directly or via a group channel. For output channels the volume fader controls the master output level of all audio channels that are routed to an output bus. For MIDI channels the volume fader controls the volume changes in the **MixConsole** by sending out MIDI volume messages to the connected instruments that are set to respond to MIDI messages.

Level Meters

The channel meters show the level when you play back audio or MIDI. The **Meter Peak Level** indicator shows the highest registered level.

- To reset the peak level, click the **Meter Peak Level** value.

NOTE

Input and output channels have clipping indicators. When they light up, lower the gain or the levels until the indicator is no longer lit.

Channel Meter Options

You can change the meter characteristics for audio channels using the context menu of the channel meter.

Meter Type - PPM

Shows a PPM type channel meter.

Meter Type - Wave

Shows a waveform type channel meter.

Meter Peak Options - Hold Peaks

The highest registered levels are held and shown as static horizontal lines in the meter.

Meter Peak Options - Hold Forever

If this option is activated, the peak levels are shown until you reset the meters. If this option is deactivated, you can use the **Meters' Peak Hold Time** parameter (**File > Preferences > Metering**) to specify for how long the peak levels are held. The peak hold time can be between 500 and 30000 ms.

Meter Position - Input

If this option is activated, the meters show input levels for all audio channels and input/output channels. The input meters are post input gain.

Meter Position - Post-Fader

If this option is activated, the meters show post-fader levels.

Meter Position - Post-Panner

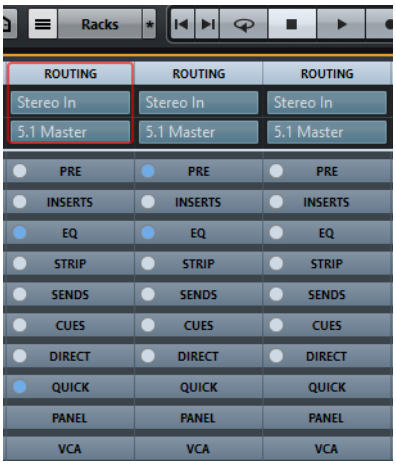
If this option is activated, the meters show post-fader levels and also reflect pan settings.

Reset Meters

Resets the meters.

Working with Channel Racks

The **Channel Racks** section holds specific **MixConsole** functions, such as routing, insert, or send handling. These are organized in racks.



Routing

The **Routing** rack allows you to configure input and output routing, that is, setting up input and output busses.

Input busses are used when you record on an audio track. In this case, you must select from which input bus the audio is received.

NOTE

The settings that you make for the input channel will be a permanent part of the recorded audio file.

Output busses are used when you play back an audio, group, or FX channel. In this case, you must route the channel to an output bus.

You can route the outputs from multiple audio channels to a group. For example, to control the channel levels using one fader, and to apply the same effects and equalization to all the channels.

Setting up Routing

PREREQUISITE

Set up busses and group channels in the **VST Connections** window.

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Routing** to show the **Routing** rack above the fader section.
3. Click one of the slots of the **Routing** rack to open the input or the output routing pop-up menu for a channel.
4. In the routing selector, select an entry.
   - To set up the routing for multiple selected channels simultaneously, press [Shift]-[Alt]/[Option] and select a bus.
   - To set several selected channels to incrementing busses (the second selected channel to the second bus, the third to the third bus, etc.), press [Shift] and select a bus.
   - To disconnect input or output bus assignments, select **No Bus**.

Input Busses

The input routing selector only lists busses that correspond to the channel configuration.

NOTE

If you select a group channel as input for an audio channel, you can record a downmix.

Output Busses

For output busses any assignment is possible.

Using Group Channels

You can route the outputs from multiple audio channels to a group. This enables you to control the channel levels using one fader, apply the same effects and EQ to all channels, etc. You can also select a group channel as input for an audio track, to record a downmix of separate tracks, for example.

PREREQUISITE

You have created and set up a group channel track in stereo.

PROCEDURE

1. Route the group channel track to an output bus.
2. Add effects to the group channel as insert effects.
3. Route the mono audio track to the group channel.

RESULT

The signal from the mono audio track is sent directly to the group, where it passes through the insert effect, in stereo.

Pre (Filters/Gain/Phase)

The **Pre** rack for audio-related channels features a high-cut and a low-cut filter as well as gain and phase settings.

For MIDI channels it allows you to open the Input Transformer.

NOTE

You cannot edit the **Pre** rack settings in the EQ curve display.

RELATED LINKS

About the Input Transformer on page 936
Equalizer Settings on page 389

Making Filter Settings

Each audio-related channel has separate high-cut and low-cut filters that allow you to attenuate signals with frequencies that are higher or lower than the cutoff frequency.

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Pre (Filters/Gain/Phase)** to show the **Pre** rack above the fader section.

3. Click to the left of the high-cut filter to activate the high-cut filter. You have the following options:
   - Drag the slider to adjust the cutoff frequency.
     The available range spans from 20 kHz to 50 Hz.
   - Click **Select Filter Slope** on the right of the high-cut filter to select a filter slope.
     You can choose between 6, 12, 24, 36, and 48 dB. The default value is 12 dB.
4. Click to the left of the low-cut filter to activate the low-cut filter. You have the following options:
   - Drag the slider to adjust the cutoff frequency.
     The available range spans from 20 Hz to 20 kHz.
   - Click **Select Filter Slope** on the right of the low-cut filter to select a filter slope.
     You can choose between 6, 12, 24, 36, and 48 dB. The default value is 12 dB.

RESULT

The changed settings are visible in the curve display. If you deactivate the high-cut and low-cut filters, the filter curves are removed from the display. Bypassed high-cut and low-cut filters are displayed in a different color.

Making Input Gain Settings

The **Pre-Gain** slider allows you to change the level of a signal before it reaches the EQ and the effects section. This is useful as the level going into certain effects can change the way the signal is affected. A compressor, for example, can be driven harder by raising the input gain. Gain can also be used to boost the level of poorly recorded signals.

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Pre (Filters/Gain/Phase)** to show the **Pre** rack above the fader section.
3. Drag the **Gain** slider to the left or to the right to cut or boost the gain.

Making Phase Settings

Each audio-related channel and input/output channel has a **Phase** button that allows you to correct the phase for balanced lines and microphones that are wired backwards or that are out of phase due to their positioning.

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Pre (Filters/Gain/Phase)** to show the **Pre** rack above the fader section.
3. Activate **Phase** to invert the phase polarity for the signal.

Inserts

The Inserts rack for audio-related channels features insert effect slots that allow you to load insert effects for a channel. For MIDI channels you can load MIDI inserts.

For further information, refer to the separate PDF document Plug-in Reference.

RELATED LINKS

Audio Effects on page 439

Adding Insert Effects

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Inserts** to show the Inserts rack above the fader section.
3. Click one of the insert slots to open the insert selector.
4. Click an insert effect to select it.

RESULT

The selected insert effect is loaded and automatically activated. Its plug-in panel opens.

Moving Inserts to Post-Fader or Pre-Fader Position

For each audio-related channel, you can add 6 pre-fader and 2 post-fader inserts.

PROCEDURE

1. Right-click an insert effect in a pre-fader position.
2. From the context menu, select **Move to Post-Fader Slot**.

   To move a post-fader insert to a pre-fader position, open its context menu and select **Move to Pre-Fader Slot**.

Bypassing Insert Effects

- To bypass all inserts, click the bypass button at the top of the **Inserts** rack.
- To bypass a single insert, click the button on the left of the inserts slot.
- To deactivate bypass, click the button again.

Activating Side-Chain for Inserts

Some of the inserts feature side-chain functionality.

PROCEDURE

1. Right-click an insert effect.
2. From the context menu, select **Activate Side-Chain**.

Saving/Loading FX Chain Presets

You can save and load all insert rack settings using FX chain presets. FX chain presets have the file name extension `.fxchainpreset`.

PROCEDURE

- In the top right corner of the **Inserts** rack, open the **Presets** pop-up menu and perform one of the following actions:
  - To save the current settings as a preset, select **Save FX Chain Preset** and name your preset.
  - To load a preset, select **Load FX Chain Preset** and select a preset.

  NOTE

  You can also apply inserts together with EQ and channel strip settings from track presets. You can load, tag, and save FX chain presets in the **MediaBay**.

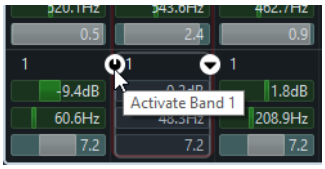
Equalizers (EQ)

The **Equalizers (EQ)** rack is only available for audio-related channels. It features a built-in parametric equalizer with up to 4 bands for each audio channel.

Activating Equalizer Bands

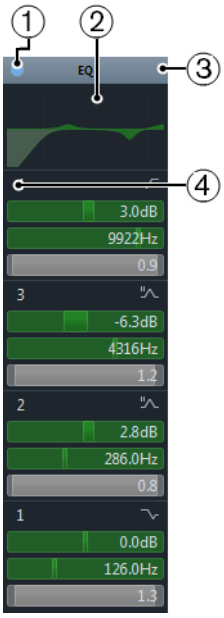
PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Equalizers** to show the **EQ** rack above the fader section.
3. Click **Activate Band** to activate an EQ band.



Equalizer Settings

You can make equalizer settings for the 4 bands. These have different default frequency values and different Q names. However, they all have the same frequency range (20 Hz to 20 kHz). You can specify different filter types for each individual module.



1) **Bypass EQ**
Click to bypass all EQ bands.

2) **Curve Display**

Click on the display in a channel to show a larger version. The display is also available in the **Inspector** and in the **Channel Settings** dialog. If you activate **Equalizer Curve** in the **Set up Window Layout** pane, the curve is removed from the EQ rack and is displayed above the racks.

Hovering with the mouse over the display shows a cross-hair cursor. The current mouse position shows the frequency, note value, offset, and level at the top or bottom of the display.

Click and hold to add a curve point and activate the corresponding EQ band. Double-click the curve point to deactivate it. Drag the curve point up or down to adjust the gain. Press [Ctrl]/[Command] to edit only the gain. Drag left or right to adjust the frequency. Press [Alt]/[Option] to edit only the frequency. Press [Shift] while dragging to set the Q-factor. To invert the EQ curve, open the context menu and select **Invert EQ Settings**.

The final curve shows the EQ settings as well as active high-cut and low-cut filters of the **Pre** rack settings. Bypassed filter settings are shown in a different color than the active settings. Disabled filter settings are hidden from the display.

NOTE

You cannot edit the high-cut and low-cut filters in the curve display. To edit the filters, open the **Pre** rack.

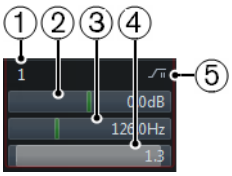
3) **Select Preset**

Opens a pop-up menu where you can load/save a preset.

4) **Activate Band**

Click to activate/deactivate an EQ band.

Band Settings



1) **Activate Band**

Activates the equalizer band.

2) **Gain**

Set the amount of cut or boost. The range is ±24dB.

3) **Frequency**

Sets the center frequency of the frequency range to be cut or boosted. You can set the frequency either in Hz or as a note value. If you enter a note value, the frequency is automatically displayed in Hz. For example, a note value of A3 sets the frequency to 440 Hz. When you enter a note value, you can also enter a cent offset. For example, enter A5 -23 or C4 +49.

NOTE

Ensure that you enter a space between the note and the cent offset. Only in this case, the cent offsets are taken into account.

4) **Q-Factor**

Determines the width of the affected frequency range. Higher values give narrower frequency ranges.

5) **Type**

Opens a pop-up menu where you can select an EQ type for the band. Bands 1 and 4 can act as parametric, shelving, or high/low-cut filters. EQ bands 2 and 3 are always parametric filters.

RELATED LINKS

Making Filter Settings on page 385

Saving/Loading EQ Presets

You can save and load EQ presets.

PROCEDURE

- In the top right corner of the **EQ** rack, open the presets pop-up menu and perform one of the following actions:
  - To save the current settings as a preset, select **Save Preset** and name your preset.
  - To load a preset, select **Load Preset** and select a preset.

NOTE

You can also apply EQ together with insert and channel strip settings from track presets. You can load, tag, and save EQ presets in the **MediaBay**.

Channel Strips

The **Channel Strip** rack is only available for audio-related channels. It allows you to load built-in processing modules for separate channels.

Channel Strip Modules

The channel strips allow you to apply modules directly to specific channels. You can change the position of specific modules in the signal flow via drag and drop.

Gate

Allows you to silence audio signals below a set threshold level. As soon as the signal level exceeds the set threshold, the gate opens to let the signal through.

Compressor

Allows you to create smooth compression effects. Drag the compressor up or down to change its position in the signal flow.

EQ

Allows you to make EQ settings.

Tools

Provides various tools.

Sat

Allows you to add warmth to the sound.

Limit

Allows you to avoid clipping even at high levels.

Noise Gate

Noise gating silences audio signals below a set threshold. As soon as the signal level exceeds the threshold, the gate opens to let the signal through.

Threshold (-60 to 0dB)

Determines the level at which **Gate** is activated. Signal levels above the set threshold trigger the gate to open, and signal levels below the set threshold close the gate.

Side-Chain

Activates the external side-chain.

Release (10 to 1000ms or Auto mode)

Sets the time after which the gate closes (after the set **Hold** time). If **Auto Release** is activated, **Gate** automatically finds the best release setting for the audio material.

State LED

Indicates whether the gate is open (LED lights up in green), closed (LED lights up in red), or in an intermediate state (LED lights up in yellow).

Attack (0.1 to 1000ms)

Sets the time after which the gate opens when it is triggered.

Range

Adjusts the attenuation of the gate when it is shut. If **Range** is set to -oo, the gate is completely shut. The higher the value, the higher the level of the signal that passes through the shut gate.

Filter Frequency (50 to 20000 Hz)

If **Side-Chain** is activated, this sets the filter frequency.

Q-Factor (0.01 to 10000)

If **Side-Chain** is activated, this sets the resonance of the filter.

Listen Filter

Allows you to monitor the filtered signal.

Compressor

This channel strip module reduces the dynamic range of the audio, making softer sounds louder or louder sounds softer, or both. Open the pop-up menu to select between **Standard Compressor**, **Tube Compressor**, and **Vintage Compressor**.

Standard Compressor

Allows you to create smooth compression effects. Drag the compressor up or down to change its position in the signal flow.

Threshold (-60 to 0 dB)

Determines the level where the compressor kicks in. Only signal levels above the set threshold are processed.

Side-Chain

Activates the external side-chain.

Ratio (1:1 to 8:1)

Sets the amount of gain reduction that is applied to signals above the set threshold. A ratio of 3:1 means that for every 3 dB the input level increases, the output level increases by 1 dB.

Gain Reduction LED

Indicates the amount of compression of the signal.

Attack (0.1 to 100 ms)

Determines how fast the compressor responds to signals above the set threshold. If the attack time is long, more of the early part of the signal passes through unprocessed.

Release (10 to 1000 ms or Auto mode)

Sets the time after which the gain returns to the original level when the signal drops below the threshold. If **Auto** is activated, the compressor automatically finds the best release setting for the audio material.

Make-up (0 to 24dB or Auto mode)

Compensates for output gain loss that is caused by compression. If **Auto** is activated, the knob becomes dark and the output is automatically adjusted for gain loss.

Tube Compressor

This versatile compressor with integrated tube-simulation allows you to achieve smooth and warm compression effects. The VU meter shows the amount of gain reduction. **Tube Compressor** features an internal side-chain section that lets you filter the trigger signal.

Input (-24.0 to 48.0dB)

Determines the compression amount. The higher the input gain, the more compression is applied.

Side-chain

Activates the external side-chain.

Output (-12.0 to 12.0dB)

Sets the output gain.

Gain Reduction LED

Indicates the amount of compression of the signal.

Attack (0.1 to 100.0ms)

Determines how fast the compressor responds. If the attack time is long, more of the initial part of the signal passes through unprocessed.

Release (10 to 1000ms or Auto mode)

Sets the time after which the gain returns to the original level. If **Auto** is activated, **Tube Compressor** automatically finds the best release setting for the audio material.

Drive (1.0 to 6.0)

Controls the amount of tube saturation.

Mix (0 to 100)

Sets the level balance between the dry signal and the wet signal.

VintageCompressor

VintageCompressor is modeled after vintage type compressors.

Input (-24 to 48dB)

In combination with the **Output** setting, this parameter determines the compression amount. The higher the input gain setting and the lower the output gain setting, the more compression is applied.

Side-chain

Activates the external side-chain.

Output (-48 to 24dB)

Sets the output gain.

Gain Reduction LED

Indicates the amount of compression of the signal.

Attack (0.1 to 100ms)

Determines how fast the compressor responds. If the attack time is long, more of the early part of the signal passes through unprocessed.

Punch (On/Off)

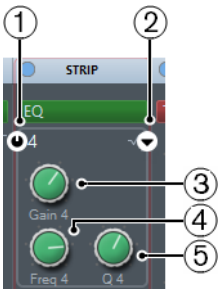
If this is activated, the early attack phase of the signal is preserved, retaining the original punch in the audio material, even with short **Attack** settings.

Release (10 to 1000ms or Auto mode)

Sets the time after which the gain returns to its original level. If **Auto** is activated, **Vintage Compressor** automatically finds the best release setting for the audio material.

EQ

You can make equalizer settings for the 4 bands. These have different default frequency values and different Q names. However, they all have the same frequency range (20Hz to 20kHz). You can specify different filter types for each individual module.



1) **Activate Band x**

Activates the equalizer band.

2) **Select EQ Band x Type**

Opens a pop-up menu where you can select an EQ type for the band. Bands 1 and 4 can act as parametric, shelving, or high/low-cut filters. EQ bands 2 and 3 are always parametric filters.

3) **Gain**

Sets the amount of cut or boost.

4) **Freq**

Sets the center frequency of the frequency range to be cut or boosted.

5) **Q**

Determines the width of the affected frequency range. Higher values give narrower frequency ranges.

Tools

Provides various tools.

DeEsser

This channel strip module reduces excessive sibilance, primarily for vocal and speech recordings. Basically, it is a special type of compressor that is tuned to be sensitive to the frequencies produced by the s-sound. Close proximity microphone placement and equalizing can lead to situations where the overall sound is just right, but there is a problem with sibilants.

Reduction

Controls the intensity of the de-essing effect.

Side-Chain

Activates the internal side-chain filter. The input signal can then be shaped according to the filter parameters. Internal side-chaining can be useful for tailoring how the gate operates.

Release

Sets the time after which the de-essing effect returns to zero when the signal drops below the threshold.

Gain Reduction LED

Indicates the amount of compression of the signal.

Threshold

If **Auto** is deactivated, you can use this control to set a threshold for the incoming signal level above which the plug-in starts to reduce the sibilants.

Auto

Automatically and continually chooses an optimum threshold setting independent of the input signal. The **Auto** option does not work for low-level signals (< -30 db peak level). To reduce the sibilants in such a signal, set the threshold manually.

Low-Frequency

Allows you to set the low frequency band.

High-Frequency

Allows you to set the high frequency band.

Solo

Allows you to solo the frequency band to find the appropriate position and width of that band.

Diff

Allows you to listen to the sounds that the de-esser removes from the signal.

EnvelopeShaper

This channel strip module can be used to attenuate or boost the gain of the attack and release phase of audio material. You can use the knobs to change parameter values. Be careful with levels when boosting the gain and if needed reduce the output level to avoid clipping.

Attack (-20 to 20dB)

Changes the gain of the attack phase of the signal.

SC (Side-Chain)

Activates the external side-chain.

Release (-20 to 20dB)

Changes the gain of the release phase of the signal.

Length (5 to 200ms)

Determines the length of the attack phase.

Output (-24 to 12dB)

Sets the output level.

Sat

Allows you to add warmth to the sound. Open the pop-up menu to select between **Magneto II**, **Tape Saturation**, and **Tube Saturation**.

Magneto II

This channel strip module simulates the saturation and compression of recording on analog tape machines.

Saturation

Determines the amount of saturation and the generation of overtones. This leads to a small increase in input gain.

Dual Mode

Simulates the use of two tape machines.

Saturation On/Off

Activates/Deactivates the saturation effect.

Output

Allows you to adjust the output level.

Saturation Amount LED

Indicates the amount of saturation of the signal.

Low-Frequency

Sets the frequency range of the spectrum band to which the tape effect is applied.

To avoid the saturation of lower frequencies, set the value to 200 Hz or 300 Hz.

High-Frequency

Sets the frequency range of the spectrum band to which the tape effect is applied.

To avoid the saturation of very high frequencies, set the **Freq Hi** parameter to values below 10 kHz.

Solo

Allows you to hear only the set frequency range including the tape simulation effect. This helps you to determine the appropriate frequency range.

HF-Adjust

Sets the amount of high frequency content of the saturated signal.

HF-Adjust On/Off

Activates/Deactivates the **HF-Adjust** filter.

Tape Saturation

This channel strip module simulates the saturation and compression of recording on analog tape machines.

Drive

Controls the amount of tape saturation.

Dual Mode

Simulates the use of two tape machines.

Auto Gain

Adjusts the gain automatically.

Output

Sets the output gain.

Drive Amount LED

Indicates the amount of drive of the signal.

Low-Frequency

This is a low shelving filter with fixed frequency.

High-Frequency

This is a Hi Cut filter. Use the frequency fader to reduce harshness of the output signal.

Tube Saturation

This channel strip module simulates the saturation and compression of recording of analogue tube compressors.

Drive

Controls the amount of tube saturation.

Output Gain

Sets the output gain.

Drive Amount LED

Indicates the amount of drive of the signal.

Low-Frequency

This is a low shelving filter with fixed frequency.

High-Frequency

This is a Hi Cut filter. Use the frequency fader to reduce harshness.

Limit

Allows you to avoid clipping even at high levels. Open the pop-up menu to select between **Brickwall Limiter**, **Maximizer**, and **Standard Limiter**.

Brickwall Limiter

Brickwall Limiter ensures that the output level never exceeds a set limit.

Due to its fast attack time, **Brickwall Limiter** can reduce even short audio level peaks without creating audible artifacts. However, this channel strip module creates a latency of 1 ms.

Threshold (-20 to 0 dB)

Determines the level where the limiter kicks in. Only signal levels above the set threshold are processed.

Release (ms)

Sets the time after which the gain returns to the original level when the signal drops below the threshold. If **Auto** is activated, **Brickwall Limiter** automatically finds the best release setting for the audio material.

Gain Reduction LED

Displays the amount of gain reduction.

Maximizer

This channel strip module raises the loudness of audio material without the risk of clipping.

Optimize

Determines the loudness of the signal.

Output (-24 to 6dB)

Determines the maximum output level. Set this to 0dB to avoid clipping.

Gain Reduction LED

Displays the amount of gain reduction.

Mix (0 to 100)

Sets the level balance between the dry signal and the wet signal.

Standard Limiter

This channel strip module is designed to ensure that the output level does not exceed a set output level, to avoid clipping in following devices. **Limiter** can adjust and optimize the **Release** parameter automatically according to the audio material, or it can be set manually.

Input (-24 to 24dB)

Adjusts the input gain.

Output (-24 to 6dB)

Determines the maximum output level.

Gain Reduction LED

Displays the amount of gain reduction.

Release (0.1 to 1000ms or Auto mode)

Sets the amount of time it takes for the gain to return to its original level. If **Auto** is activated, **Limiter** automatically finds the best release setting for the audio material.

Saving/Loading Strip Presets

You can save and load strip presets. Strip presets have the file name extension `.strippreset`.

PROCEDURE

- In the top right corner of the **Channel Strip** rack, open the **Presets** pop-up menu and perform one of the following actions:
  - To save the current settings as a preset, select **Save Strip Preset** and name your preset.
  - To load a preset, select **Load Strip Preset** and select a preset.

  NOTE

  You can also apply channel strip settings together with insert and EQ settings from track presets. You can load, tag, and save strip presets in the **MediaBay**.

Sends

The **Sends** rack for audio-related channels features send effect slots that allow you to load send effects and value sliders that allow you to determine the send level for a channel. For MIDI channels the **Sends** rack features send effect slots that allow you to load send effects.

Adding Send Effects

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Sends** to show the rack above the fader section.
3. Click one of the send slots to open the send selector.
4. Click a send effect to select it.
   The selected send effect is loaded.
5. Click on the left of the slot to activate the send.

Bypassing Send Effects

- To bypass all sends, click the bypass button at the top of the **Sends** rack.
- To deactivate bypass, click the button again.

Adding FX Channels to a Send

PROCEDURE

1. Right-click on the send slot to open the context menu.
2. Select **Add FX Channel to Send**.
3. In the **Add FX Channel Track** window, select the effect and configuration.
4. Click **Add Track**.

RESULT

The FX channel track is added in the **Project** window, and the send is automatically routed to it.

Cue Sends

Cue sends allow you to create discrete cue mixes that performers can listen to during recording. Essentially, cue sends are stereo aux sends that are routed to cue channel outputs in the **Control Room Mixer**.

For every cue channel defined in the **VST Connections** window, each channel in the **MixConsole** has a cue send, with level, pan, and pre/post-fader selection.

Adding Cue Sends

PREREQUISITE

Create a cue channel in the **VST Connections** window and activate the **Control Room**.

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Cue Sends** to show the rack above the fader section.
3. Click one of the slots to open the send selector.
   The cue sends are displayed.
4. Click on the left of the slot to activate the cue send.

RESULT

You can now change the level and pan settings.

Direct Routing

The **Direct Routing** rack allows you to set and activate outputs for all selected channels at once.

In addition to the main output you can set up 7 routing destinations that are positioned post-fader and post-panner in the signal path. This allows you to switch the destination of channels, and create different mix versions in one go. The direct routing features are available for audio, instrument, FX channel tracks, groups, and output busses.

Setting Up Direct Routing

In the **Direct Routing** rack you can assign up to 8 routing destinations to each channel.

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Direct Routing**.

   The **Direct Routing** rack is shown above the fader section.
3. Select all channels for which you want to set up the same destinations, press [Shift]-[Alt]/[Option] and click in the first slot of the **Direct Routing** rack.
4. In the routing selector, select the main output for the selected channels.

   NOTE

   We recommend that you choose the same set of destinations for all channels that belong together. The main output should also have the widest channel configuration, since it is used as a reference for all additional output destinations.
5. Click in the next destination slot and select another output.
6. Do this for as many destination slots as required (up to 8).

   After routing your audio tracks to groups, you can route the groups to output busses.
7. For each channel, you can now activate the appropriate routing destination by clicking on the corresponding slot.

   The active routing destination lights up in green.

Automating Destination Switches

Especially in larger postproduction scenarios you often need to switch the output destinations for audio-related tracks. Automating these switches is especially useful for FX channel tracks that carry insert effects such as reverb that you want to apply to different stems. You can also automate switches, if a certain type of sound is sometimes part of the ambience stem and at other times needs to be fed to the SFX stem.

PROCEDURE

1. Play back your project and take note of the positions where routing changes are necessary.
2. Write-enable the corresponding track.
3. At the right moment, click on the routing destination to which you want to switch.

   The new destination is now active, and the switch has been recorded as automation data.
4. Continue to record destination changes for your project.

   NOTE

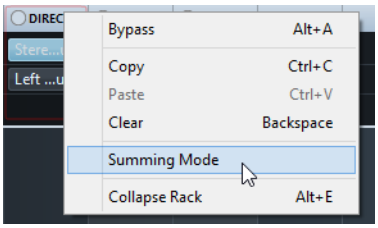
   To switch destinations for multiple channels simultaneously, select these channels and keep [Shift]-[Alt]/[Option] pressed when activating a different destination.

Feeding Signals to Multiple Destinations

Direct routing offers a summing mode, allowing you to feed your signals to several outputs at the same time. This is useful if you want to apply an effect to several stems at the same time, for example.

PROCEDURE

1. Set up your output busses as routing destinations.
2. In the **Direct Routing** rack, open the context menu and activate **Summing Mode** for all channels that you want to sum.



   NOTE

   To activate this setting for all channels at once use the **Link** function.

3. Activate all outputs to which you want to route the selected channels.

RELATED LINKS

Setting up Routing on page 384

Automatic Downmixing

The output in the first **Direct Routing** slot defines the channel width. Since the other destinations are positioned post-panner in the signal path, they have the same channel width to start with, and the signal needs to be converted accordingly by downmixing. Nuendo does that automatically.

NOTE

Always select the output with the widest channel configuration in the first slot. It is not recommended to use a setup where the main output has less channels than the direct routing destination even though it is technically possible. Upmixing might lead to unexpected side effects.

When performing an automatic downmix from 5.1 to stereo, the levels are adjusted as follows:

	L	**R**	**C**	**Lfe**	**Ls**	**Rs**
L	0.0		-3.01	-3.01	-6.02	
R		0.0	-3.01	-3.01		-6.02

Center and Lfe signals are split to L and R channels, Ls and Rs are sent to L and R respectively, but reduced in volume.

When performing an automatic downmix from 7.1 to 5.1 the levels are adjusted as follows:

	L	**R**	**C**	**Lfe**	**Ls**	**Rs**	**Lc**	**Rc**
L	0.0						-3.01	
R		0.0						-3.01
C			0.0				-3.01	-3.01
LFE				0.0				
Ls					0.0			
Rs						0.0		

Lc and Rc signals are split to L/R respectively and the center channel.

Track Quick Controls

Track Quick Controls give you instant access to up to 8 different parameters, for example, track, effect, or instrument controls. This saves you from having to click your way through the various windows and sections pertaining to your track.

Adding Track Quick Controls

PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **Track Quick Controls** to show the rack above the fader section.
3. Click one of the slots to open the Quick Controls selector.
4. Click a parameter to select it.

RESULT

The selected parameter is loaded and automatically activated as Track Quick Control.

Assigning Parameters from Racks or Channel Settings

You can assign several parameters to Quick Control slots directly from within racks or channel settings in the **MixConsole**.

Some specific racks and channel settings allow you to add several parameters directly to the **Quick Controls** tab in the Inspector.

- Pre (Filters/Gain/Phase)
- Equalizers
- Channel Strip

You can assign an effect parameter either to the next empty slot or to a specific Quick Control slot.

NOTE

These options are only available for VST 3 plug-ins that support this function.

PROCEDURE

- Right-click the parameter.
  - To assign the parameter to the next empty slot, select **Add “x” to Quick Controls** (where x is the name of the parameter).
  - To assign the parameter to a specific slot, select **Add “x” to Quick Controls Slot** (where x is the name of the parameter). Then select the slot from the submenu.

RELATED LINKS

Track Quick Controls on page 709

Device Panels

You can display device panels, for example, for external MIDI devices, audio track panels, or VST insert effect panels.

For information on how to create or import MIDI device panels, see the separate PDF document MIDI Devices.

RELATED LINKS

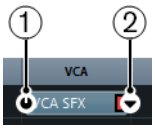
About Device panels on page 759

VCA

The **VCA** rack allows you to set and view connections to VCA faders.

The VCA rack allows you to connect channels to VCA faders. You can also let VCA faders control other VCA faders.

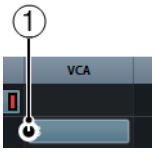
The VCA rack is divided into 2 slots. The top slot shows the name and color of the VCA fader that controls the connected channel. You can select the VCA fader that you want to connect to the channel and activate/deactivate an existing connection to the VCA fader. The top slot is available for channels and VCA faders.



1) Activate/Deactivate VCA connections

2) VCA selector

The bottom slot shows the number of channels that are connected to a VCA fader. You can activate/deactivate the connection between the VCA fader and the connected channels. The bottom slot is only available for VCA faders.



1) Activate/Deactivate VCA connections

RELATED LINKS

VCA Faders on page 368

Activating the VCA Rack

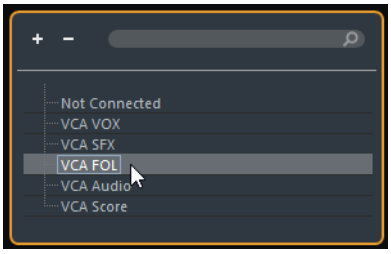
PROCEDURE

1. On the **MixConsole** toolbar, activate **Show Channel Racks**.
2. Click **Racks** and activate **VCA** to show the **VCA** rack above the fader section.

Connecting Channels with VCA Faders

PROCEDURE

1. In the fader section of the **MixConsole**, create an unassigned VCA fader.
2. In the **VCA** rack of the channel that you want to connect to the VCA fader, click the top slot.
3. In the VCA selector, select the name of the unassigned VCA fader.



RESULT

The channel is connected to the VCA fader. The **VCA** rack slot of the channel displays the name and the color of the VCA fader. The **VCA** rack slot of the VCA fader displays the number of connected channels.

RELATED LINKS

Creating VCA Faders on page 370

Connecting Several Channels with VCA Faders

You can connect several channels to VCA faders using **Q-Link**.

PROCEDURE

1. Select several channels in the **MixConsole** and activate **Q-Link**.
2. In the **VCA** rack of one of the selected channels, click the top slot.
3. In the VCA selector, select the name of the VCA fader.

RESULT

All channels are connected to the VCA fader. The **VCA** rack slots of the channels display the name and the color of the VCA fader. The **VCA** rack slot of the VCA fader displays the number of connected channels.

RELATED LINKS

Using Quick Link on page 368

Disconnecting Channels from VCA Faders

PROCEDURE

1. In the **MixConsole**, in the **VCA** rack of the channel that you want to disconnect, click the slot that displays the connected VCA fader.
2. In the VCA selector, select **Not Connected**.
3. Specify if the connected channels keep the combined automation.

RELATED LINKS

VCA Fader Automation on page 371

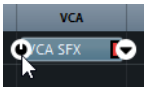
Deactivating VCA Connections

You can deactivate the connection between VCA faders and channels temporarily.

Instead of breaking the connection between VCA fader and channels, the connection and automation are suspended until you reactivate the connection.You can deactivate the connection either for a channel or for a VCA fader.

PROCEDURE

- In the VCA rack in the top slot of a VCA fader or a channel, click **Activate/Deactivate VCA Connection**.



RESULT

If you deactivate the connection for a channel, only the channel loses the connection temporarily. The connection between the VCA fader and the other channels remains intact.

If you deactivate the connection for a VCA fader, the connection to all connected channels is suspended.

Using Channel Settings

You can open each **MixConsole** channel in a separate **Channel Settings** window. This allows for better overview and editing of the channel settings.

- To open the channel settings for a specific channel, click **E** in the fader section.

For audio-related channels, the following sections can be shown/hidden by clicking **Set up Window Layout** and activating/deactivating the corresponding options:

- **Channel Inserts**
- **Channel Faders**
- **Direct Routing**
- **Channel Sends**

The Channel Strip and Equalizer are always available.

The channel settings are especially suitable for the following actions:

- Routing inserts

  This is done on the **Routing** tab in the **Inserts** section.

- Moving the channel strip to Pre/Post-Inserts position

  By default, the inserts are positioned before the channel strip in the signal flow. In the **Inserts** section you can change this by clicking the arrow at the top of the **Strip** tab. The tabs are swapped.

- Making EQ settings

  The channel settings feature a large EQ curve display with several modes. By default, the equalizer controls are hidden, but you can click the little green button at the top right corner to show the equalizer controls or the equalizer knob controls below the EQ curve.

- Panning sends

  This is done on the **Panning** tab in the **Sends** section.

- Showing the output chain

  If you click **Show Output Chain** on the toolbar, the output chain is shown in the **Channel Faders** section. This allows you to keep track of more complicated output routings.

- Browsing through channels

RELATED LINKS

Equalizer Settings on page 389
Using the Routing Editor on page 445
Direct Routing on page 403

Browsing through Channels

Every channel has its own **Channel Settings** window, but you can view any channel's settings from a single window. This allows you to have a single Channel Settings window open in a convenient position on the screen and use it for all your EQ and channel effect settings.

To select a channel in the **Channel Settings** window, proceed as follows:

- To show the previous/next channel, click **Go to Previous/Next Channel**.
- To browse through the edited channels, click **Go to Last/Next Edited Channel**.

  The buttons are only available if at least two channels have been edited.

- Click the channel name or the **Search** tool on the toolbar and select a channel.

- Select a channel in the **MixConsole** to select the corresponding channel in the **Channel Settings** window.

  This is the default behavior. If this is not what you want, open the **Functions** menu and deactivate **Follow 'e' buttons or selection changes**.

- Select a track in the **Project** window to select the corresponding channel in the **MixConsole** and the **Channel Settings** window.

  This is the default behavior. If this is not what you want, deactivate **Sync Selection in Project Window and MixConsole** in **Preferences > Editing > Project & MixConsole**.

Adding Notes to a MixConsole Channel

PROCEDURE

1. On the **MixConsole** toolbar, click **Set up Window Layout**, and activate **Notepad**.

   The **Notepad** section is shown above the fader section.
2. Select the channel for which you want to add notes, click in the notepad section and type in your notes.
3. To close the notepad, press [Esc], or click in another section of the **MixConsole**.

Keyboard Navigation

The channel selector section, the channel rack section, and the fader section can be controlled with the computer keyboard.

For this, you must activate a section. An activated section is indicated by a frame.

Activating a Section for Keyboard Navigation

PROCEDURE

1. Click in an empty area of the section to activate it.

   Activated sections are shown with a white frame.
2. Press [Tab] to activate the next section.
3. Press [Shift]-[Tab] to activate the previous section.

Navigating in a Section

Once you have activated a section, you can use the computer keyboard as described below. In the channel racks section and in the fader section, controls that are selected for keyboard control are indicated by a red frame.

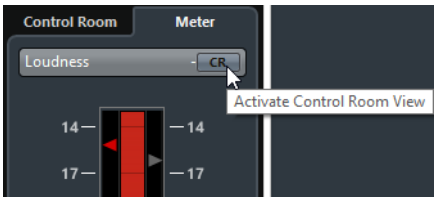
- To navigate through the controls, use the arrow keys.
- To activate or deactivate a switch, press [Return].
- To expand or collapse an active rack, to open or close a value field in a slot, or to open the plug-in panel for a loaded plug-in, press [Return].
- To access the controls in the left zone, press [Ctrl]/[Command]-[Return].
- To access the controls in the middle zone, press [Return].
- To access the controls in the right zone, press [Alt]/[Option]-[Return].
- To close a pop-up menu or a plug-in panel, press [Esc].
- To enable or disable the loaded plug-in, press [Ctrl]/[Command]-[Alt]/[Option]-[Return].

Control Room

The Control Room allows you to divide the studio environment into the performing area (studio) and the engineer/producer area (control room).

To open the **Control Room Mixer** you have the following options:

- To open the **Control Room** in a separate window, select **Devices > Control Room Mixer**.
- To open **Control Room** section in the **MixConsole**, select **Devices > MixConsole > Set up Window Layout > Control Room/Meter** and activate the **Control Room View** button.



The **Control Room Mixer** is divided into 2 sections.

- To open a section, click the tab at the bottom of the mixer.

The **Mixer** tab contains all controls that you use regularly during recording, mixing, and mastering, for example.

The **Setup** tab contains settings that you most probably use only once for a project.

Adding Channels to the Control Room

To be able to use the Control Room, you must add the channels that you need first.

PROCEDURE

1. Select **Devices > VST Connections**.
2. Click **Studio**.
3. Click **Add Channel**.

   A pop-up menu lists all available channel types and shows how many instances of each type are available.
4. Select a channel type.

   For most channel types, a dialog opens, that allows you to choose the channel configuration.

5. Click the **Audio Device** column to set an audio device for the channel type.
6. Click the **Device Port** column to assign a port for the channel.

IMPORTANT

You cannot assign the same device port to a bus or channel and a Control Room channel at the same time.

RESULT

The Control Room functions are available for use. If you disable the Control Room, the configuration is saved and will be restored when you reenable the Control Room.

Output Routing

For the Control Room to function correctly, you must assign the Main Mix bus to the set of outputs that contains the mix that you want to hear.

If you only have one output bus, it automatically becomes the Main Mix. All other outputs are not routed through the Control Room Mixer.

The channel width of the Control Room can only be as wide as the Main Mix bus.

All other outputs are not routed through the **Control Room Mixer**.

However, they can be added as additional monitor sources in the **VST Connections** window. When the Control Room is enabled, the Main Mix bus is automatically shown on the **Studio** tab. The reason is that the Main Mix is always available as a monitor source in the **Control Room Mixer**.

Exclusive Assignment of Monitor Channels

Generally, the port assignment to the Control Room channels is exclusive. However, it can be useful to create monitor channels that share device ports with each other as well as inputs and outputs. This can be helpful if you use the same speakers as a stereo pair and also as the left and right channels of a surround speaker configuration, for example.

Switching between monitors that share device ports is seamless, multi-channel audio is mixed down to stereo as needed. Only one monitor set can be active at a time.

If your scenario does not require you to assign ports to several monitor channels, it is recommended to activate the **Exclusive Device Ports for Monitor Channels** option (**File > Preferences > VST > Control Room**). This way, you make sure that you do not accidentally assign ports to inputs/outputs and monitor channels at the same time.

IMPORTANT

The state of the **Exclusive Device Ports for Monitor Channels** preference is saved together with the Control Room presets. Therefore, if you recall a preset, your current setting in the **Preferences** dialog might be overwritten.

Control Room Channels

Each Control Room channel type that you create defines an input or output of the **Control Room Mixer**.

Monitor Channels

A monitor channel represents a set of outputs that are connected to monitor speakers in the Control Room.

You can create up to 4 monitor channels for a mono, stereo, or surround speaker configuration. Each monitor can have its own custom downmix settings, input gain, and input phase settings.

NOTE

Monitor channels can share hardware inputs or outputs with another bus or channel. When you create the connections for the monitor channels, device ports that are already used for other busses or channels are shown in red on the **Device Port** pop-up menu. If you select a used port, its previous connection is lost.

Monitor Sources

You can set up different monitor sources and use the **Control Room Mixer** to select the mix sources that you want to listen to. Different monitor sources for dialogue, sound effects, and music are useful in post production setups that require more than one mix bus.

You can create up to 8 monitor sources for a mono, stereo, or surround speaker configuration. These can be input or output busses that you set up in the **Inputs/Outputs** tab of the **VST Connections** window, or a group channel.

IMPORTANT

If you select a monitor source with a wider configuration than the Main Mix bus, automatic downmixing occurs.

Phones Channel

You can use the phones channel in the Control Room to listen to cue mixes.

You can create 1 phones channel for a stereo configuration. It allows you to listen to the main mix or cue mixes or to external inputs on a pair of headphones. You can also use it for previewing.

Cue Channels

You can use cue channels for sending cue mixes, also known as headphone mixes, to performers in the studio during recording.

You can create up to 4 cue channels in mono or stereo for 4 discrete cue mixes. Cue channels have talkback and click functions. They allow you to monitor the main mix, external inputs, or a dedicated cue mix.

EXAMPLE

If you have 2 available headphone amplifiers for performers, you can create 1 cue channel for each cue mix and name them according to their function: vocalist mix, bass player mix, etc.

Cue Channels and Cue Sends

For every cue channel that you define in the **VST Connections** window, each channel in the **MixConsole** has a cue send with level, pan, and pre/post-fader selection. These cue sends can be used to create discrete cue mixes that performers can listen to.

- To show the cue sends, open the **MixConsole**, and activate **Racks > Cue Sends**.

External Inputs

You can use external inputs for monitoring external devices, such as CD players, multi-channel recorders, or any other audio source.

You can create up to 6 external inputs for a mono, stereo, or surround speaker configuration.

NOTE

If you select external inputs as input source of an audio channel, you can record them. In this case, you do not need to assign the device ports to the input channel.

Talkback Channels

You can use talkback channels for communication between the Control Room and performers in the studio.

You can create up to 4 talkback channels and assign a mono input channel to each one of them.

You can also use talkback channels as input source for audio tracks and record them. You can route them to each cue channel and use different levels.

You can insert effects like a compressor or limiter on talkback channels. This ensures that erratic levels do not disturb performers and that clear communication with everyone is possible.

NOTE

The **Auto Disable Talkback Mode** option (**File > Preferences > VST > Control Room**) allows you to specify how talkback works during playback and recording.

Metering Channel

You can use a metering channel for connecting a hardware metering device.

The metering channel allows you to meter monitoring sources without having the listening volume affect the meter. This channel is a physical ASIO output which feeds the same signal that goes through the meter channel.

NOTE

The metering channel does not appear in the project.

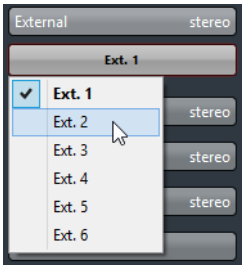
Control Room Mixer

The **Control Room Mixer** displays information and controls for the channels that you define on the **Studio** tab in the **VST Connections** window.

The **Control Room Mixer** is divided into a number of sections that you open by clicking their header. To open several sections simultaneously, use [Ctrl]/[Command]-click.

External

The **External** section allows you to use external inputs for monitoring external devices. It is only shown if you have added more than one external input in the **VST Connections** window.



To switch to another external input, click the input name and select a new external input from the pop-up menu.

Monitor Sources

The **Monitor Sources** section allows you to select which monitor sources are routed to the Control Room.

1) **Multiple Monitor Sources**

Allows you to listen to several submixes at the same time. For this to work, you must activate the monitor sources that you want to include.

2) **Monitor Sources**

Allows you to listen to a monitor source. If you want to listen to only one source, deactivate **Multiple Monitor Sources**.

To listen to monitor source exclusively, even if **Multiple Monitor Sources** is activated, [Alt]/[Option]-click a monitor source.

To deactivate several monitor sources, even if Multiple Monitor Sources is activated, [Shift]-click the monitor source buttons.

Cue Channel

The **Cue Channel** section allows you to set up cue channels for sending cue mixes.

1) **Activate Cue Channel**

Allows you to activate/deactivate the cue channel.

2) **Source Selectors**

Allow you to select the source for the cue channel: monitor mix (**Mix**), external inputs (**Ext**), or the cue sends (**Cues**). The signal presence indicators in the upper left corner light up when the source channel is sending data to the cue channel.

3) **Enable Talkback to Cue Channel**

Allows you to activate talkback for communication between the Control Room and the performers in the studio. You can set the level of the talkback signal with the slider.

4) **Activate Metronome Click**

Activates the metronome click. Use the **Click Level** and **Click Pan** controls to set the volume and the pan position of the metronome click.

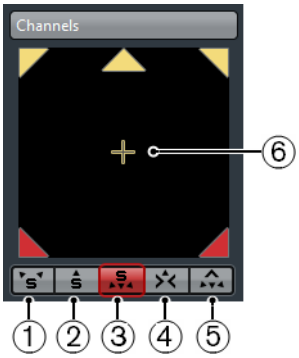
5) **Signal Level**

Allows you to set the signal level.

Channels

The **Channels** section shows the speaker arrangement of the Main Mix bus.

You can use the solo functions to listen to individual channels of the Main Mix. You can also use this to test your multi-channel speaker system and make sure that the correct channels are routed to the speakers.



1) **Solo Left and Right Channels**

Allows you to solo the left and right channels.

2) **Solo Front Channels**

Allows you to solo the front channels.

3) **Solo Surround Channels**

Allows you to solo the surround channels.

4) **Listen to Solo Channels on Center Channel**

Allows you to listen to all soloed speakers in the center channel. If the center channel is not available, the channels are distributed equally to the left and right.

5) **Listen to Surround Channels on Front Channels**

Allows you to solo the surround channels and route them to the front speakers.

6) **Solo LFE Channel**

Allows you to solo the LFE channel.

Monitors

The **Monitors** section allows you to select and configure the monitor sets.

Downmix Presets

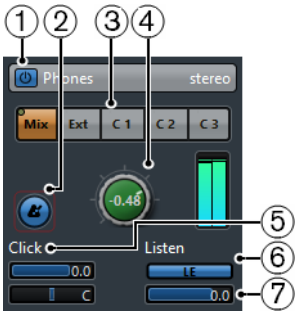
The **Downmix Presets** section allows you to configure downmix presets.

1) **Assign Downmix Preset**
Allows you to configure a downmix preset for the monitor that is selected in the **Monitors** section.

2) **Select Output Configuration**
Allows you to select an output channel configuration.

Phones

The **Phones** section allows you to use the phones channel in the Control Room to listen to cue mixes.



1) **Activate Phones Channel**
Allows you to activate/deactivate the phones channel.

2) **Activate Metronome Click**

Activates the metronome click.

3) **Source Selectors**

Allow you to select the source for the phones channel: monitor mix (**Mix**), external inputs (**Ext**), or the cue sends (**Cues**). The signal presence indicators in the upper left corner light up when the source channel is sending data to the Phones channel.

4) **Phones Level**

Allows you to set the phones level. [Ctrl]/[Command]-click to set the level to the reference level specified in the **Preferences** dialog (**VST–Control Room page**).

5) **Click Level and Click Panning**

Use the **Click Level** and **Click Panning** controls to set the volume and the pan position of the metronome click.

6) **Enable Listen for Output**

Enables the listen bus function.

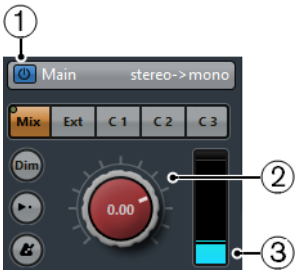
7) **Listen Level**

Allows you to set the listen level.

Control Room Channel

The Control Room channel is the representation of the bus that is set up as the Main Mix bus on the **Outputs** tab in the **VST Connections** window or the one that is selected as monitor source.

The following section contains a description of the individual controls.



1) **Activate Control Room Channel**

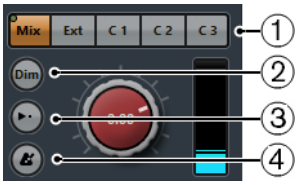
Allows you to activate/deactivate the Control Room channel.

2) **Signal Level**

Allows you to set the volume for the Control Room output. This does not affect the recording input level or the Main Mix level for exporting mixdowns. [Ctrl]/[Command]-click to set the level to the reference level specified in the **Preferences** dialog (**VST–Control Room** page).

3) **Signal Meter**

Shows the volume for the Control Room output.



1) **Source Selectors**

Allow you to select the source for the Control Room channel. The available sources depend on the channels that you added to the Control Room. The signal presence indicators in the upper left corner light up when the source channel is sending data to the Control Room channel.

2) **Dim Signal**

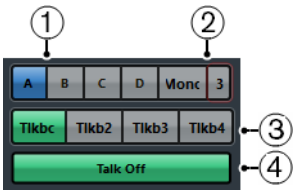
Activate this to lower the Control Room level by a fixed amount. This allows a quick reduction in monitor volume without disturbing the current monitor level. Clicking the **DIM** button again returns the monitor level to the previous setting.

3) **Use Reference Level**

Enable this button to set the Control Room level to the reference level specified in the **Preferences** dialog (**VST–Control Room** page). The reference level is the level that is used in calibrated mixing environments, such as film dubbing stages.

4) **Activate Metronome Click**

Activates the metronome click.



1) **Monitor Selectors**

Allow you to select another monitor source.

2) **Downmix Preset Selectors**

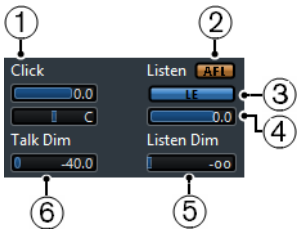
Allow you to select another downmix preset.

3) **Activate Talkback**

Allows you to activate talkback for communication between the Control Room and the performers in the studio. Click to activate, click and hold for momentary mode.

4) **Talk Off**

If you add more than 1 talkback channel, **Talk Off** becomes available. This allows you to deactivate all activated talkback channels.



1) **Click Level and Click Pan**

Use the **Click Level** and **Click Pan** controls to set the volume and the pan position of the metronome click for the Control Room channel.

2) **AFL/PFL**

Allows you to determine whether the signal of a listen-enabled channel is routed to the Control Room channel after applying the fader and pan settings (AFL) or before applying the fader and pan settings (PFL).

3) **Enable Listen for Output**

Enables the listen bus function for the Control Room output.

4) **Listen Level**

Allows you to adjust the volume of listen bus signals that are routed to the Control Room output.

5) **Listen Dim**

Allows you to adjust the volume of the Main Mix or monitor source when channels are in listen mode. This keeps listen-enabled channels in context with the Main Mix. If the **Listen DIM** level is set to the minimum value, you only hear the listen-enabled channels.

6) **Talk Dim**

When **Talkback** is active, this slider controls how much the output of all the channels in the Control Room Mixer is reduced, to prevent unwanted feedback.

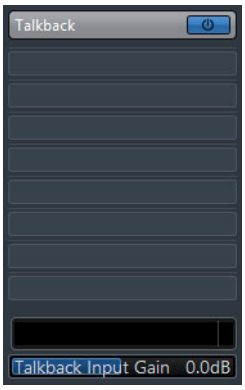
Control Room Setup

The **Control Room** setup contains additional settings for the channels.

- To open the **Control Room** setup, click the **Setup** tab at the bottom right of the Control Room.

The **Control Room** setup is divided into a number of sections that you open by clicking their headers.

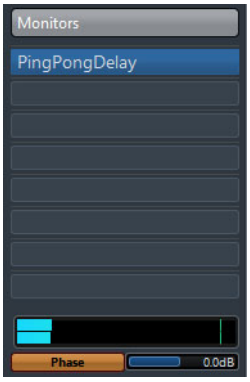
Input Gain



Setting up the input gain can be useful in the following situations:

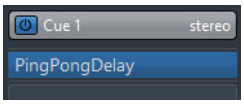
- To balance the level of external inputs, for example, CD players and other sources to the Main Mix level, for A/B comparisons.
- To balance the level of your monitor systems, so that switching between sets of speakers does not change the playback volume.

Input Phase



Reversing the input phase can be useful for external inputs and monitor speaker outputs.

Insert Effects



Each Control Room channel has a set of insert effect slots.

- Use the inserts on the Control Room channel for metering and spectral analysis plug-ins.

All solos including the Listen bus will come through the Control Room channel and allow analysis of individual sounds. A brickwall limiter in the last insert slot of the Control Room channel can prevent accidental overloads and damage to speaker systems.

- Use the inserts for the talkback channel to control the dynamics of the talkback microphone.

  This helps protect performers' hearing and ensures that everyone can be heard over the talkback microphone.

- Use the monitor inserts for surround decoding or brickwall limiting to protect sensitive monitor speakers.

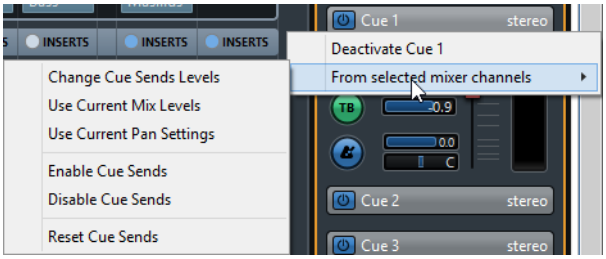
  Each monitor channel has a set of eight inserts, all of which are post Control Room fader.

Setting Up a Cue Mix

You can create a cue mix from the fader and pan levels that are used in the **MixConsole** and change them to meet the needs of the individual performers.

PROCEDURE

1. In the **MixConsole**, select the channels from which you want to copy the settings.
2. In the **Control Room**, do one of the following:
   - To apply the function only to this cue channel, right-click on a cue channel to open the context menu.
   - To apply the function to all cue channels, click anywhere but on a cue channel to open the context menu.
3. Select **From selected mixer channels** and select one of the functions.



Cue Mix Context Menu

Change Cue Sends Levels

Allows you to adjust multiple send levels at the same time.

Use Current Mix Levels

Allows you to copy the fader levels of the selected tracks to the cue sends. This sets all cue send levels for the selected tracks to the level of the main channel fader. It also changes the cue send status to pre-fader, so that changes in the main mix do not affect the cue sends.

Use Current Pan Settings

Allows you to copy pan information from the main mix to the cue sends of the selected tracks. If the cue send is mono, the pan setting is copied, but the output of the cue send is the sum of the left and right channels.

Enable Cue Sends

Allows you to activate the cue sends of the selected channels. To be able to hear the cue mix for a cue channel, the cue sends must be enabled.

Disable Cue Sends

Allows you to disable the cue sends of the selected channels.

Reset Cue Sends

Allows you to deactivate the cue sends, to change the send level of all selected channels to 0dB, and to set the signal source to post-fader. This way, any changes to the main mix also change the cue mix. To raise the level of individual cue channels, raise the level on that channel.

Adjusting the Overall Cue Send Level

You can adjust multiple send levels at the same time for the cue send mix, keeping the blend intact while lowering the overall volume. This is sometimes necessary, because the levels in the main mix are often optimized for the loudest possible signal level without clipping.

This means that when you create a “more me” mix, you may find that there is not enough headroom available in the cue send to raise levels without introducing clipping.

PROCEDURE

1. In the **MixConsole**, select the channels that you want to modify.
2. In the **Control Room**, right-click a cue channel to open the context menu.
3. Select **From selected mixer channels > Change Cue Sends Levels**.
4. Activate **Relative Mode**.

   This way, you adjust the existing levels. By deactivating **Relative Mode**, all cue sends are set to the same absolute level.

5. Adjust the level as necessary.

   The level of all selected cue sends is adjusted by the set amount.

6. Click **OK**.

Metering

Loudness

Nuendo allows you to measure the loudness in compliance with the loudness recommendation R128 of the European Broadcasting Union (EBU). Measurements that correspond to this recommendation consider loudness, loudness range, and maximum true peak level values.

Loudness Measurement

The following measurements are performed:

- **Integrated Loudness**

  Average loudness that is measured over the whole track in LUFS (Loudness Unit, referenced to Full Scale).

  According to the loudness recommendation R128, audio should be normalized at -23 LUFS (±1 LU).

- **Short-Term Loudness**

  Loudness that is measured every second on an audio block of 3 seconds. This gives information about the loudest audio passages.

- **Momentary Loudness**

  Maximum value of all momentary loudness values that are measured every 100 ms in an audio range of 400 ms.

Loudness Range

The loudness range measures the dynamic range over the whole title in LU (Loudness Units). It reports the ratio between the loudest and the quietest non-silent sections. The audio is divided into small blocks. Every second there is one audio block, and each block lasts 3 seconds so that the analyzed blocks overlap.

The top 10% of the quiet blocks and the top 5% of the loud blocks are excluded from the final analysis. The calculated loudness range is the ratio between the loudest and quietest remaining audio blocks. This measurement helps you to decide if and how much compression or expansion you can or should apply to the audio.

True Peaks

When a digital signal is converted to an analog signal, EBU R128 recommends that you rather measure an estimation of the real peaks instead of relying on digital peaks. This avoids clipping and distortion.

Naming and Units

The EBU R 128 proposes the following naming and units conventions:

- A relative measurement, such as a value that is relative to a reference level, LU as Loudness Unit (1 LU is 1 dB).
- An absolute measurement, LUFS as loudness unit referenced to full scale. 1 LUFS can be understood as 1 dB in the AES-17 scaling.

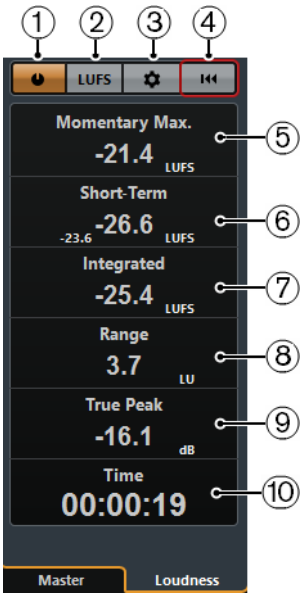
Loudness Meter

The **Loudness** meter allows you to analyze, measure, and monitor the loudness of your project in real-time during playback or mixing.

- To open the **Loudness Meter**, select **Devices > Control Room Mixer > Meter > Loudness**.

- The green triangle on the left side shows the integrated loudness value.
- The gray triangle on the right side shows the short-term loudness.

The following parameters are available:



1) **Measure Loudness**

Allows you to activate the loudness measurement.

2) **Switch between LU and LUFS**

Allows you to switch the meter scale between LU (relative values) and LUFS (absolute values).

3) **Configure Loudness Settings**

Opens a dialog with further loudness settings.

4) **Reset Loudness**

Allows you to reset the loudness measurement.

5) **Momentary Max.**

Shows the maximum of all measured momentary loudness values.

6) **Short-Term**

Shows the loudness that is measured over a duration of 3 s.

7) **Integrated**

Shows the average loudness that is measured from start to stop. The period of measurement is shown in the **Time** display. The recommended value for the integrated loudness is -23 LUFS. This absolute value is the reference point for the relative LU scale where -23 LUFS equals 0 LU.

8) **Range**

Shows the dynamic range of the audio that is measured from start to stop. This value helps you to decide how much dynamic compression you can apply. The range that is recommended for highly dynamic audio like film music, for example, is 20 LU.

9) **True Peak**

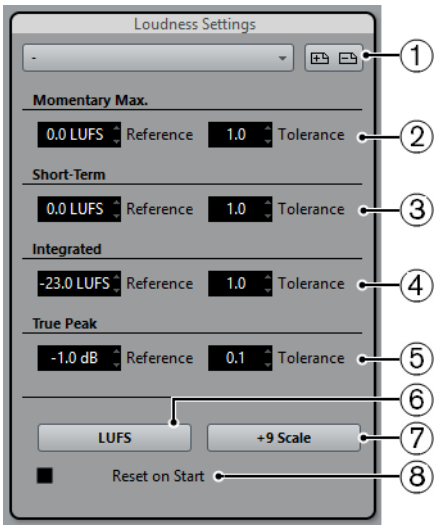
Shows the true peak level of the audio. The maximum permitted true peak level in production is -1 dB.

10) **Time**

Shows the duration of the integrated loudness measurement.

Loudness Settings

- To open the **Loudness Settings** dialog, select **Devices > Control Room Mixer > Meter > Loudness > Configure Loudness Settings**.



The following parameters are available:

1) **Select Preset**

Allows you to create, load, and remove loudness presets.

2) **Momentary Max.**

Allows you to specify a reference value and a tolerance value for the maximum momentary loudness. If higher values are detected, the clipping indicator in the loudness meter turns red.

3) **Short-Term**

Allows you to specify a reference value and a tolerance value for the short-term loudness. If higher values are detected, the clipping indicator in the loudness meter turns red.

4) **Integrated**

Allows you to specify a reference value and a tolerance value for the integrated loudness. If higher values are detected, the clipping indicator in the loudness meter turns red.

5) **True Peak**

Allows you to specify a reference value and a tolerance value for the true peak level. If higher values are detected, the clipping indicator in the loudness meter turns red.

6) **Switch between LUFS and LU**

Allows you to switch the meter scale between LUFS (absolute values) and LU (relative values).

7) **Switch between EBU +9 Scale and EBU +18 Scale**

Allows you to switch the meter scale between EBU +9 and EBU +18.

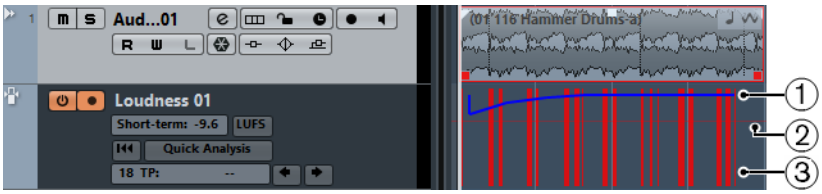
8) **Reset on Start**

Activate this to reset all values on playback start.

Loudness Track

The loudness track allows you to record the loudness of your whole project or of specific sections.

- To add a loudness track, select **Project > Add Track > Loudness**.



1) **Loudness curve**

Shows the loudness values that were detected during the loudness measurement.

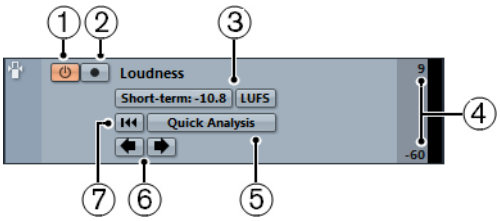
2) **Reference loudness level**

Shows the EBU R-128 reference loudness level of -23LUFS (0LU).

3) **True peaks**

Shows the detected true peaks that exceed the reference value that you can set up in the **Loudness Settings** dialog.

Loudness Track Controls



1) **Activate Loudness Calculation**
Allows you to activate the loudness calculation.

2) **Enable Recording of Loudness Curve**
Allows you to record the loudness curve on the loudness track.

3) **Switch Between LU and LUFS**
Allows you to switch the meter scale between LU (relative values) and LUFS (absolute values).

4) **Visible Loudness - upper/lower limit**
Allows you to adjust the visible loudness. Click the values for the upper or lower limit, and drag the slider up or down.

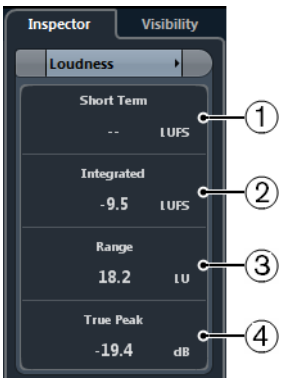
5) **Quick loudness analysis**
Allows you to perform a quick loudness analysis of the section that is encompassed by the left and right locators.

6) **Jump to previous/next True Peak**
Allows you to jump to the previous/next true peak in the loudness curve.

7) **Clear Loudness Curve**
Allows you to clear the loudness curve.

Loudness Track Inspector

The loudness track inspector shows the most important values of the loudness meter.



1) **Short Term**

   Shows the loudness that is measured over a duration of 3 s.

2) **Integrated**

   Shows the average loudness that is measured from start to stop. The period of measurement is shown in the **Time** display. The recommended value for the integrated loudness is -23 LUFS. This absolute value is the reference point for the relative LU scale where -23 LUFS equals 0 LU.

3) **Range**

   Shows the dynamic range of the audio that is measured from start to stop. This value helps you to decide how much dynamic compression you can apply. The range that is recommended for highly dynamic audio like film music, for example, is 20 LU.

4) **True Peak**

   Shows the true peak level of the audio. The maximum permitted true peak level in production is -1 dB.

Measuring Short-Term Loudness during Playback

You can record and display the short-term loudness during playback as a curve on the loudness track.

PREREQUISITE

You have added the loudness track to your project.

PROCEDURE

1. In the track list for the loudness track, activate **Activate Loudness Calculation**.

   By default, loudness calculation is deactivated for performance reasons.
2. Activate **Enable Recording of Loudness Curve**.
3. Play back your project.

RESULT

The short-term loudness level is measured in real-time at the cursor position. The corresponding loudness curve is written to the loudness track.

Measuring Short-Term Loudness Offline

You can record and display the short-term loudness for a defined section only on the loudness track using offline analysis.

PREREQUISITE

You have added the loudness track to your project.

PROCEDURE

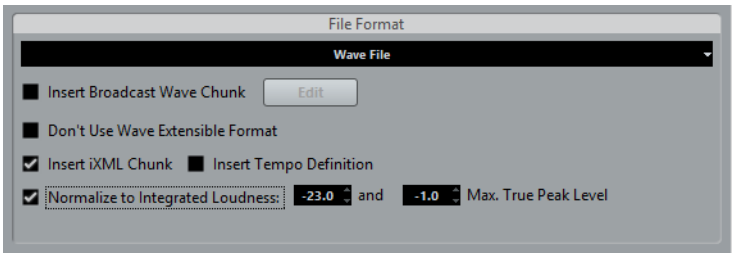
1. Set up the left and right locators to encompass the section that you want to analyze.
2. In the track list for the loudness track, activate **Activate Loudness Calculation**.
   By default, loudness calculation is deactivated for performance reasons.
3. Click **Quick Analysis**.

RESULT

The loudness curve is created for the defined section and displayed on the loudness track.

Normalizing Loudness on Export

You can normalize your audio to the integrated loudness on export. However, this is only suited for small level deviations and does not compensate for proper mixing.



- **Normalize to Integrated Loudness**
  Activate this to normalize your audio to the integrated loudness value that is specified in the field to the right.
- **Max. True Peak Level**
  Activate this to limit the peak levels to the value that is specified in the field to the right.

Audio Effects

Nuendo comes with a number of effect plug-ins included. This chapter contains general details about how to assign, use and organize effect plug-ins. The effects and their parameters are described in the separate PDF document “Plug-in Reference”.

IMPORTANT

This chapter describes audio effects, i.e. effects that are used to process audio, group, VST instrument, and ReWire channels.

Overview

Audio effects can be used as follows:

- **Insert effects**

  These effects are inserted into the signal chain of an audio channel, which means that the whole channel signal passes through the effect. This makes inserts suitable for effects for which you do not need to mix dry and wet sound, e.g. distortion, filters or other effects that change the tonal or dynamic characteristics of the sound.

  You can have up to eight different insert effects per channel (and the same is true for input and output busses – for recording with effects and master effects, respectively).

- **Send effects**

  Each audio channel has eight sends, each of which can be freely routed to an effect (or to a chain of effects).

  Send effects are practical for two reasons: you can control the balance between the dry (direct) and wet (processed) sound individually for each channel using the sends, and several different audio channels can use the same send effect. Send effects are handled by means of FX channel tracks.

- **Offline processing**

  You can apply effects directly to individual audio events.

VST 3 Standard

The VST 3 plug-in standard offers many improvements over the previous VST 2 standard and yet retains full backwards compatibility.

Nuendo is able to run plug-ins originally developed for different platforms: you can use a 32-bit plug-in with the 64-bit version of Nuendo under Windows 8 64bit and Mac OS X 10.8.

NOTE

This functionality is provided to allow you to load older projects including their original plug-ins on current computers. However, the plug-ins will require higher CPU performance when compared to their native platform. Therefore, it is recommended to use 64-bit versions of such plug-ins or instruments once available.

Smart Plug-In Processing

The VST 3 standard features smart plug-in processing, i.e., processing by a plug-in can be disengaged if there is no signal present. This can greatly reduce the CPU load, thus allowing for more effects to be used.

This is achieved by activating the “Suspend VST3 plug-in processing when no audio signals are received” option in the Preferences dialog (VST–Plug-ins page).

When this is activated, VST 3 plug-ins will not consume CPU power on silent passages, i.e. when no audio data runs through them.

However, be aware that this can lead to a situation where you added more plug-ins on “transport stop” than the system can handle on playback. Therefore, you should always find the passage with the largest number of events playing simultaneously to make sure that your system offers the required performance.

NOTE

Activating this option can increase your system performance a lot in certain projects, but it also makes it more unpredictable whether the project can play back fine on any timecode position of the project.

Side-Chain Inputs

Several VST 3 effects feature side-chain inputs. This means that the operation of the effect can be controlled via external signals routed to the side-chain input. The effect processing is still applied to the main audio signal.

RELATED LINKS

Side-Chain Input on page 455

Plug-In Delay Compensation

A plug-in effect may have some inherent delay or latency. This means that it takes a brief time for the plug-in to process the audio fed into it – as a result, the output audio will be slightly delayed. This especially applies to dynamics processors featuring look-ahead functionality.

Nuendo provides full plug-in delay compensation throughout the entire audio path. All plug-in delays are compensated for, maintaining the sync and timing of all audio channels.

Normally, you do not have to make any settings for this. However, VST 3 dynamics plug-ins with look-ahead functionality have a “Live” button, allowing you to disengage the look-ahead to minimize latency, if they are to be used during realtime recording (see the separate PDF document “Plug-in Reference”).

You can also constrain the delay compensation, which is useful to avoid latency when recording audio or playing a VST instrument in real time.

RELATED LINKS

Constrain Delay Compensation on page 701

Tempo Sync

Plug-ins can receive timing and tempo information from the host application (in this case, Nuendo). Typically, this is used to synchronize certain plug-in parameters (such as modulation rates or delay times) to the project tempo.

- This information is automatically provided to any VST plug-in (2.0 or later) that requests it.

  You do not have to make any special settings for this.

- You set up tempo sync by specifying a base note value.

  You can use straight, triplet or dotted note values (1/1 to 1/32).

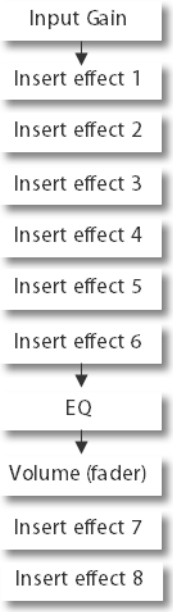
Please refer to the separate PDF document “Plug-in Reference” for details about the included effects.

Insert Effects

As the name implies, insert effects are inserted into the audio signal path – this means that the audio channel data will be routed through the effect.

You can add up to eight different insert effects independently for each audio-related channel (audio track, group channel track, FX channel track, VST instrument channel or ReWire channel) or output bus.

The signal passes through the effects in series from the top downwards, with the signal path shown below:



As you can see, the last two insert slots (for any channel) are post-EQ and post-fader. Post-fader slots are best suited for insert effects where you do not want the level to be changed after the effect, such as dithering and maximizers – both typically used as insert effects for output busses.

NOTE

Applying several effects on several channels may be too much for your CPU to handle! If you want to use the same effect with the same settings on several channels, it may be more efficient to set up a group channel and to apply your effect only once, as a single insert for this group. You can use the VST Performance window to keep an eye on the CPU load.

RELATED LINKS

Dithering on page 447

Routing Through Insert Effects

Insert effect settings are available in the Inserts rack of the MixConsole, the Channel Settings window, and the Inspector.

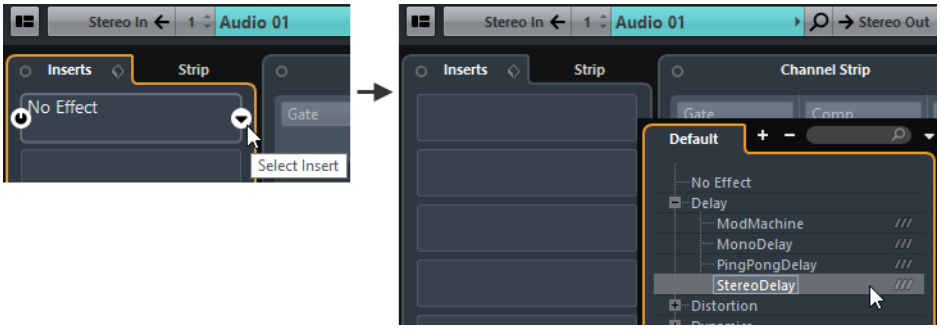
The examples below show the Channel Settings window, but the procedures are the same for all the inserts sections.

PROCEDURE

1. Bring up the Channel Settings window.

   The insert slots are found on the Inserts tab.

2. Move the mouse over the first insert slot, click on the arrow symbol that is displayed, and select an effect from the selector.



RESULT

The effect is loaded and automatically activated and its control panel opens. You can open the control panel for a loaded effect by double-clicking in the middle of the insert slot.

- If the effect has a dry/wet Mix parameter, you can use this to adjust the balance between the dry signal and the effect signal.
- To remove an effect, open the pop-up selector and select “No Effect”.
- You can add up to 8 insert effects per channel this way.
- You can reorder the effects by clicking and dragging.
- You can copy an effect into another effect slot (for the same channel or between channels) by holding down [Alt]/[Option] and dragging it onto another effect slot.
- You can open all plug-ins inserted for a particular track at once by holding [Ctrl]/[Command]-[Shift]-[Alt]/[Option] and clicking the edit button for that track in the Inspector or in the MixConsole. [Shift]-click the edit button to close any insert plug-ins for the track.

Deactivating vs. Bypassing

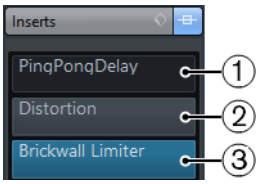
If you want to listen to the track without having it processed by a particular effect, but do not want to remove this effect completely from the insert slot, you can either deactivate or bypass it.

Deactivating means to terminate all processing, whereas bypassing means to play back only the unprocessed original signal – a bypassed effect is still processing in the background. Bypassing allows for crackle-free comparison of the original (“dry”) and the processed (“wet”) signal.

- To bypass an effect, click the button on the left in the insert slot.

  When an effect is bypassed, the slot turns gray.

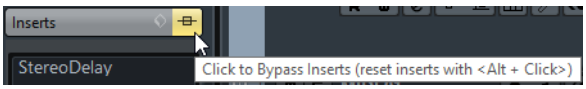
- To deactivate an effect, hold [Alt]/[Option] and click its Bypass button.



1) This effect is deactivated.
2) This effect is bypassed.
3) This effect is activated.

- To bypass all inserts for a track, click the “Bypass Inserts” button.

  This button can be found on the right of the header of the Inserts section in the Inspector. It lights up in yellow to indicate that one or more inserts of this track are bypassed.



In the Channel Settings window, you can find the button on the left of the Inserts tab.

Effects in Multi-Channel Configurations

Whether an effect plug-in supports mono, stereo, or multi-channel processing depends on the capabilities of the corresponding plug-in.

Regardless of this, all VST 2 and VST 3 plug-ins can be inserted on tracks with a multi-channel configuration. Surround-capable plug-ins are applied to all speaker channels (or a subset of these), while mono or stereo effects can only process one or two channels.

For example, if you insert a plug-in on a 5.1 track, Nuendo tries to apply a 5.1 configuration to this plug-in. If the plug-in is surround capable, this is accepted. However, if you insert a stereo insert effect, the first speaker channels of the track (L and R) are routed through the effect’s available channels, and the other channels of the track are left unprocessed.

Setting Up the Channel Configuration for the Plug-In

You can apply a plug-in to specific channels in a multi-channel configuration.

PROCEDURE

1. On the plug-in panel, open the Input Configuration pop-up.

2. Select the setup with the desired number of channels.

   The first entry is always identical with the channel configuration of the track. Below this you will find all possible channel subsets of the default configuration that are supported by Nuendo.

   NOTE

   Not all plug-ins support all the channel configurations. If you select a configuration that is not supported by a plug-in, it will automatically choose a different configuration. If the Effect Routing pop-up menu does not contain the configuration that you need, you can use the Routing Editor.

Using the Routing Editor

You can set up the routing for the individual channels.

PROCEDURE

1. Open the Channel Settings window for the track on which the effect is inserted.

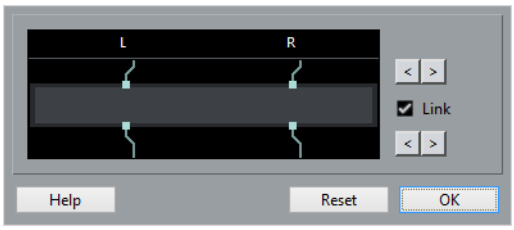
   You can also open the Routing Editor by selecting Open Routing Editor on the Effect Routing pop-up for the plug-in.

2. In the Inserts section, open the Routing tab.

   A signal diagram is shown for each loaded insert.

3. Double-click on the diagram.

   The Routing Editor opens.



4. Make your settings by using the arrow buttons, the Link checkbox and by clicking the lines.

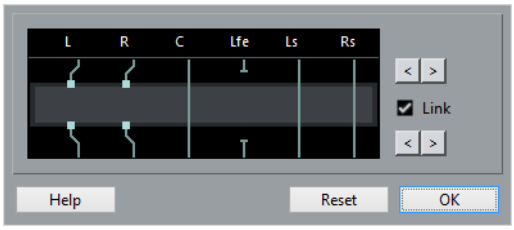
Routing Editor

The Routing Editor allows you to freely set up the routing for the individual channels. It shows the channels in the current configuration, with signals passing from top to bottom.

- The gray field in the middle represents the actual effect plug-in.
- The squares above represent inputs to the effect plug-in.
- The squares below represent outputs from the effect plug-in.
- A line represents a bypass connection – the audio on that speaker channel passes the effect without being processed.

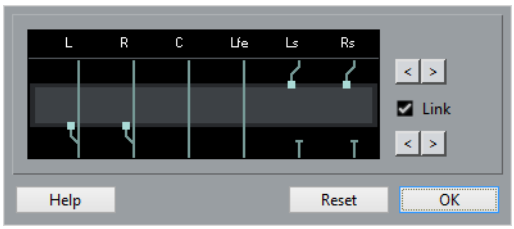
  To break the connection, click on the line.

  A broken line indicates a broken connection – the audio on that speaker channel will not be sent to the output at all. To create a bypass connection, click the broken connection.



- The upper arrow buttons allow you to change the input assignment of the channels.
- The lower arrow buttons allow you to change the output assignment of the channels.
- If you activate Link, you can move the input and output connections together.

- If you move inputs or outputs independently, you create a “cross-connection”.



  The audio on the Ls-Rs channels is processed in the plug-in and output on the L-R channels. Since the L-R channels are bypassed, this means the final L-R output will contain both the original L-R signals and the processed Ls-Rs signals.

- If a channel is bypassed (a straight line is shown through the plug-in), you can click on the line to break the connection.

  Click again to replace the broken connection with a bypass.

- If you click Reset, the original setup is reset.

NOTE

Changes you make in this editor are audible immediately.

Adding Insert Effects to Busses

You can add insert effects to busses. The easiest way to add insert effects is the Channel settings window.

If you add insert effects to an input bus, the effects will become a permanent part of the recorded audio file.

If you add insert effects to an output bus, all audio routed to that bus is affected.

Dithering

Dithering is a method for controlling the noise produced by quantization errors in digital recordings. The theory behind this is that during low level passages, only a few bits are used to represent the signal, which leads to quantization errors and hence distortion.

For example, when “truncating bits”, as a result of moving from 24 to 16 bit resolution, quantization errors are added to an otherwise immaculate recording. By adding a special kind of noise at an extremely low level, the effect of these errors is minimized. The added noise could be perceived as a very low-level hiss under exacting listening conditions. However, this is hardly noticeable and much preferred to the distortion that otherwise occurs.

When should I use dithering?

- Consider dithering when you mix down to a lower resolution, either in realtime (during playback) or with the Export Audio Mixdown function.

  A typical example is when you mix down a project to a 16-bit stereo audio file for audio CD burning.

What is a “lower resolution” then? Well, Nuendo uses 32-bit float resolution internally, which means that all integer resolutions (16 bit, 24 bit, etc.) are lower. The negative effects of truncation (no dithering) are most noticeable when mixing down to 8 bit, 16 bit and 20bit format; whether to dither when mixing down to 24 bits is a matter of taste.

Applying Dithering

PROCEDURE

1. Open the Channel Settings window for the output channel by clicking its Edit button in the MixConsole.
2. Open the effect selector for slot 7 or 8.

   The two last Insert effect slots (for all channels) are post-fader, which is crucial for a dithering plug-in. The reason is that any master gain change applied after dithering would bring the signal back to the internal 32 bit float domain, rendering the dithering settings useless.
3. Select the included UV22HR plug-in from the selector.
4. Make sure that the plug-in is set to dither to the correct resolution.

   This would be the resolution of your audio hardware (on playback) or the desired resolution for the mixdown file you want to create (as set in the Export Audio Mixdown dialog).
5. Use the other parameters in the control panel to set up the dithering to your liking.

RELATED LINKS

Export Audio Mixdown on page 1018

Adding Insert Effects to Group Channels

You can add insert effects to group channels. This is useful if you have several audio tracks that you want to process through the same effect (e.g. different vocal tracks that you want to be processed by the same compressor).

PROCEDURE

1. Create a group channel track and route it to the desired output bus.
2. Add the desired effect to the group channel as an insert effect.
3. Route the audio track to the group channel.

RESULT

The signal from the audio track is sent directly to the group, where it passes through the insert effect.

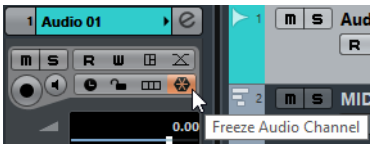
NOTE

You can also process mono audio tracks through stereo insert effects.

Freezing Insert Effects for a Track

Freezing insert effects for a track allows you to reduce processor power.

- To freeze a track, click its Freeze button in the Inspector.



- The Freeze Channel Options dialog opens, allowing you to set a “Tail Size” time in seconds.

  This adds time at the end of the rendered file to allow reverb and delay tails to fully fade out.

- The program now renders the output of the track, including all pre-fader insert effects, to an audio file.

  This file is placed in the “Freeze” folder within the Project folder.

- The frozen audio track is locked for editing in the Project window.

  The frozen insert effects cannot be edited or removed and you cannot add new insert effects for the track (except post-fader effects).

- On playback, the rendered audio file is played back. You can still adjust the level and panning in the MixConsole, make EQ settings and adjust the effect sends.

  In the MixConsole, the channel for a frozen track is indicated by a “snow flake” symbol above the channel name.

After freezing the Inserts for a track, you hear the track play back as before but the insert effects do not have to be calculated in real time, easing the load on the computer processor. Typically, you would freeze a track when it is finished and you do not need to edit it anymore.

NOTE

You can only freeze audio tracks this way, not group channel tracks or FX channel tracks.

NOTE

Post-fader inserts can not be frozen.

- To unfreeze a frozen track, click its Freeze button again.

Send Effects

Send effects are outside of an audio channel's signal path, i.e. the audio data to be processed must be sent to the effect.

To this end, Nuendo provides FX channel tracks. When you have created such a track, it is added to the track list and can be selected as a routing target in the Send slots of audio channels.

- When selecting an FX channel track in one of the send slots of an audio channel, the audio is sent to the FX channel and through any insert effects set up for it.

  The sends can be routed to different FX channels, and thus different FX channel insert effect configurations. You control the amount of signal sent to the FX channel by adjusting the effect send level.

- If you have added several effects to the FX channel, the signal passes through the effects in series, from the top (the first slot) downward.

  This allows for "custom" send effect configurations – e.g. a chorus followed by a reverb followed by an EQ and so on.

- The FX channel track has its own channel in the MixConsole.

  Here you can adjust the effect return level and balance, add EQ and route the effect return to any output bus.

- Each FX channel track can have any number of automation tracks, for automating various effect parameters.

RELATED LINKS

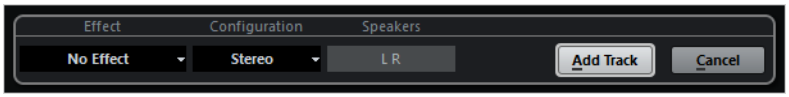
Automation on page 658

Adding an FX Channel Track

PROCEDURE

1. Select **Project > Add Track > FX Channel**.

   A dialog opens.



2. Select a channel configuration for the FX channel track.

   Normally, stereo is a good choice since most effect plug-ins have stereo outputs.

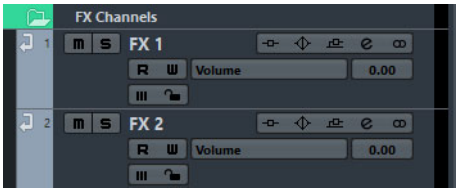
3. Select an effect for the FX channel track.

4. Click **Add Track**.

   An FX channel track is added to the track list, and the selected effect, if any, is loaded into the first insert effect slot for the FX channel (in that case, the lit Inserts tab for the FX channel track in the Inspector indicates that an effect has been assigned and automatically activated).

RESULT

All FX channel tracks you create will appear in a dedicated “folder” track in the track list. This makes it easy to manage and keep track of all your FX channel tracks, and also allows you to save screen space by folding in the FX Channel folder.



FX channel tracks are automatically named “FX 1”, “FX 2” etc., but you can rename them if you wish. Just double-click the name of an FX channel track in either the track list or the Inspector and type in a new name.

Adding and Setting Up Effects

You can add a single insert effect when you create the FX channel track. To add and set up effects after the FX channel track is created, you can either use the Channel Settings window or the Inspector for the track.

PROCEDURE

1. In the track list, the MixConsole, or the Inspector, click the Edit button for the FX channel track to open the Channel Settings window.

   On the left in the window you can find the Inserts section.

2. On the toolbar, open the Output pop-up menu and make sure that the FX channel is routed to the correct output bus.

3. To add an insert effect in an empty slot (or to replace the current effect in a slot), click the slot and select an effect from the selector.

4. In the control panel of the effect, set the wet/dry Mix control to all wet.

   This is because you control the balance between the wet and the dry signal with the effect sends.

RESULT

The handling and operation of insert plug-ins for FX channels is the same as for audio channels. You can adjust level, pan and EQ for the send in the Channel Settings window, the MixConsole or in the Inspector.

RELATED LINKS

Routing Through Insert Effects on page 442

Routing an Audio Channel to the FX Channel

The next step is to set up a send for an audio channel and route it to the FX channel.

This can be done in the MixConsole, in the Channel Settings window, or in the Inspector for the audio track. The example below shows the Channel Settings window, but the procedure is similar for all the sections:

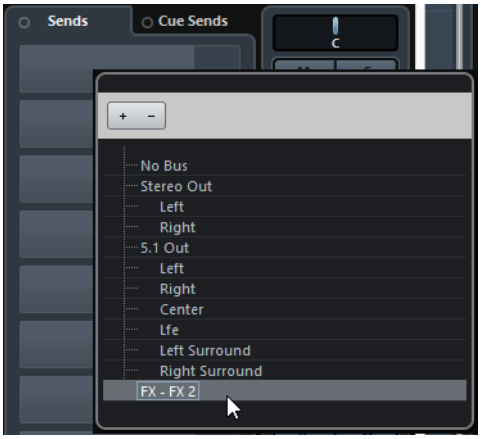
PROCEDURE

1. Click the “e” button for an audio channel to bring up its Channel Settings window.

   Each of the sends has the following controls:

   - An On/Off button for activating/deactivating the effect
   - A send level slider

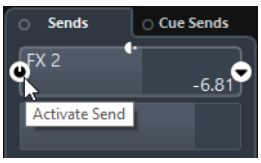
2. Click the arrow icon in an empty send slot to open the selector, and select an FX channel track as routing destination.



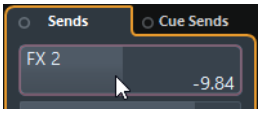
   - If the first item on this menu (“No Bus”) is selected, the send is not routed anywhere.
   - Items called “FX 1”, “FX 2” etc. correspond to existing FX tracks. If you renamed an FX track, that name will appear on this menu instead of the default.
   - The menu also allows for routing a send directly to output busses, separate output bus channels or Group channels.

- You can apply or remove a send to or from all the selected channels at once by holding down [Shift]-[Alt]/[Option] and selecting the desired effect from any of the effect slots.

3. Activate the On/Off button for the send.



4. Click and drag the send level slider to determine how much of the signal from the audio channel is routed to the FX channel.



Setting the Send level

You can also double-click and enter a value numerically. If you hold down [Alt]/[Option] when double-clicking, the send destination is shown in the Channel Settings window. If you have routed the send to an FX channel, the plug-in panel opens.

NOTE

To determine how much of the signal from the FX channel is sent to the output bus, open the Channel Settings window for the FX track and adjust the effect return level.

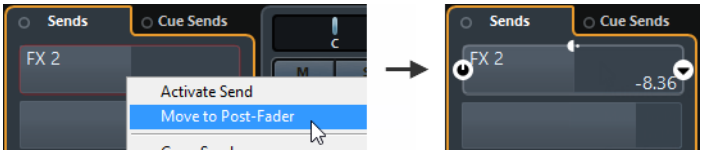
RELATED LINKS

Adding an FX Channel Track on page 450

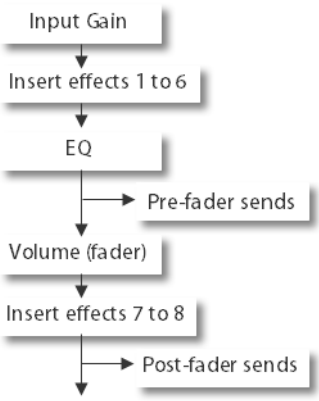
Pre/Post Fader Sends

Normally you want the effect send to be proportional to the channel volume (post-fader send). However, you can send the signal to the FX channel before the audio channel's volume fader.

- If you want the signal to be sent to the FX channel before the audio channel's volume fader in the MixConsole, right-click on a send and select "Move to Pre-Fader".



The picture below shows where the sends are "tapped" from the signal in pre and post-fader mode:



NOTE

Use the channel's Mute button to determine whether a send in pre-fader mode is affected. This is done with the "Mute Pre-Send when Mute" option in the Preferences dialog (VST page).

NOTE

The FX channels themselves have sends, too.

Setting Pan for the Sends

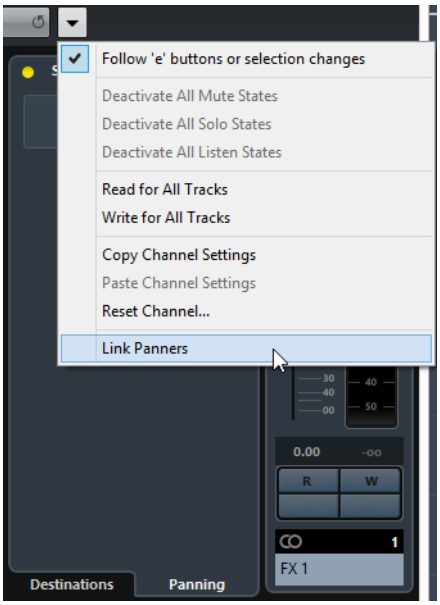
There are several possibilities to set up pan for the sends:

- To position the send signal at center pan in the stereo FX channel (or anywhere you like), route a send from a mono channel to a stereo FX channel track.
- To use the pan control as a crossfader, determining the balance between the stereo sides when the stereo send signal is mixed to mono, route a send from a stereo channel to a mono FX channel track.
- To use the surround panner to position the send signal in the surround image, route a send from a mono or stereo channel to an FX channel track in surround format.
- To set the panning with the MixConvert plug-in, route a send from a surround channel to an FX channel in a format with less channels.

PROCEDURE

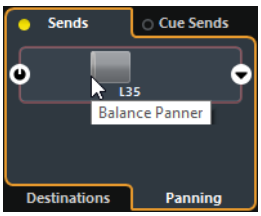
1. Open the Channel Settings window for the audio channel.

   In the Sends section of the Channel Settings window, on the Panning tab, each send is shown with a pan fader. On the Functions menu, you can activate the "Link Panners" option. The send panners will then follow the pan for the channel, making the stereo imaging as clear and true as possible. This behavior can also be set as default for all channels. The corresponding setting is available in the Preferences dialog (VST page).



2. Click and drag the pan control for the desired send(s) in the display.

   You can reset the pan control to the center position by [Ctrl]/[Command]-clicking on the pan control.



   If the FX channel is configured in a surround format, the pan control will be a miniature surround panner.

   You can click and drag the “ball” in the miniature panner display to position the send in the surround field, or double-click in the display to bring up the surround panner.

   NOTE

   If both the send (the audio channel) and the FX channel are in mono, the pan control is not available.

RELATED LINKS

Surround Sound on page 637

Side-Chain Input

Many VST 3.0 effects feature a side-chain input. Side-chaining allows you, for example, to lower the music volume when someone is speaking (“ducking”) or to use compression (e.g. on a bass sound) when the drums are hit, thereby “harmonizing” the intensity of the two instruments. Another possibility is to use the side-chain signal as a source for modulation.

Effects from the following categories feature side-chain: Delay, Dynamics, Modulation, and Filter.

IMPORTANT

For detailed descriptions of the plug-ins that feature side-chaining, see the separate PDF document “Plug-in Reference”.

NOTE

Certain combinations of tracks and side-chain inputs may lead to feedback loops and added latency. If this is the case, the side-chain options will not be available.

Side-chain and Modulation

Side-chain signals bypass the built-in LFO modulation and instead apply modulation according to the envelope of the side-chain signal. Since each channel will be analyzed and modulated separately, this allows for creating astonishing spatial modulation effects.

About drag & drop

When you drag effects from one insert slot to another (on the same channel or between different channels), the following applies:

- When you move an effect within a channel (e.g. from slot 4 to slot 6), the side-chain connections will be kept.
- When you drag and drop an effect between two channels, the side-chain connections will not be kept.
- When copying an effect into another effect slot (for the same or a different channel), the side-chain connections will not be copied, i.e. they will be lost.

Creating a Ducking Delay

You can silence the delay repeats by side-chain signals exceeding a certain threshold. You can use this feature to create a so-called “ducking delay” for your vocals. Let’s say you want to add a delay effect that is audible only when no signal is present on the vocal track. For this, you need to set up a delay effect which is deactivated every time the vocals start again.

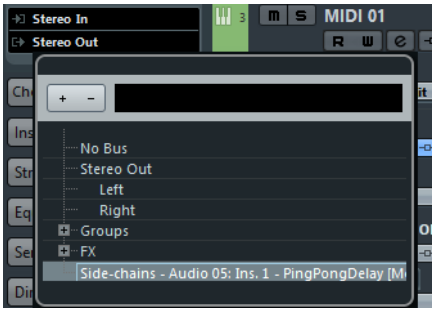
PROCEDURE

1. Select the vocal track.
2. On the Project menu, select “Duplicate Tracks”.
   Now you can use the vocal events on the second track to silence the delay effect.
3. Open the Inserts tab for the first vocal track in the Inspector and select “PingPongDelay” from the effects selector.
   The control panel for the effect opens.

4. On the control panel for the effect, make the desired effect settings and activate the Side-Chain button.

   Try out the effect settings to find out which settings will work best with your project. For detailed descriptions of the parameters, see the separate PDF document “Plug-in Reference”.

5. In the track list, select the second vocal track.
6. On the Output Routing selector, locate the Side-Chain node and select the PingPongDelay effect that you set up for the vocal track.



   This way, the signals from the second (duplicate) track are routed to the effect (and do not end up in the mix).

Result

Now every time the signals on the vocal track exceed the threshold, the delay will be deactivated. Since the threshold for the delay effect is fixed, you may have to adjust the volume of track 2, in this example, to ensure that vocal parts of low or middle volume will also silence the delay effect.

Triggering a Compressor Using Side-Chain Signals

Compression, expansion or gating can be triggered by side-chain signals exceeding a specified threshold. This allows you to lower the volume of one instrument every time another instrument is played. In this example, you lower the volume of the bass guitar during the bass drum hits.

Procedure

1. Select the bass guitar track.
2. In the Inspector, open the Inserts section, and select the Compressor effect found in the Dynamics category.

   The effect is loaded into the effect slot and the effect control panel opens.
3. Activate the Side-Chain button.
4. Select the bass drum track.

5. In the Inspector, open the Sends section, open the effects selector, and from the Side-chains mode, select the Compressor effect you created for the bass guitar track.
6. Adjust the Send level.

   This way, the bass drum signal triggers the compressor on the bass guitar track.

RESULT

When you now play back the project, the bass guitar will be compressed whenever the signals on the bass drum track exceed the threshold.

External Effects

You can set up external FX busses to make your outboard equipment part of your studio.

An external FX bus is a combination of outputs (sends) and inputs (returns) on your audio hardware, along with a few additional settings.

All external FX busses you have created will appear on the effect pop-up menus and can be selected like the internal effect plug-ins. If you select an external effect as an insert effect for an audio track, the audio will be sent to the corresponding audio output, processed in your hardware effect (provided that you have connected it properly) and returned via the specified audio input.

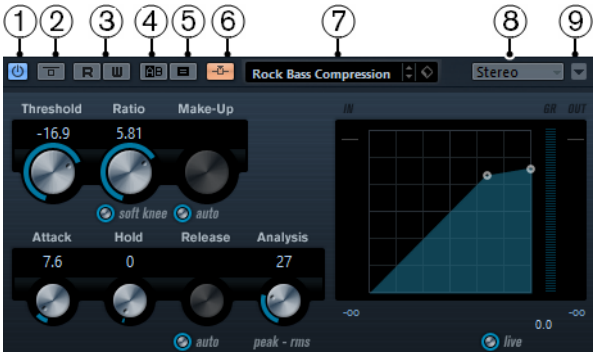
RELATED LINKS

VST Connections on page 22
External Instruments and Effects on page 34

Effect Control Panel

You can open the control panel for the loaded plug-in by double-clicking the center part of an insert or a send slot. If you edit the parameters for an effect, these settings are saved automatically with the project.

The contents, design and layout of the control panel depend on the selected effect.



1) Activate Effect
2) Bypass Effect
3) Read/Write Automation
4) Switch between A/B Settings
5) Copy A to B
6) Activate Side-Chain
7) Preset selector
8) Routing selector
9) Functions menu

NOTE

The included effects and their parameters are described in detail in the separate PDF document “Plug-in Reference”.

Comparing Effect Settings

You can compare two different parameter settings for an effect.

PROCEDURE

1. Adjust the effect parameters for setting A.
2. Click **A/B Setting** to activate setting B.
   As a starting point for setting B, the parameters for setting A are copied.
3. Adjust the parameters for setting B.
4. Click **A/B Setting** to activate setting A and compare both settings.

RESULT

You can compare the settings between A and B using the corresponding buttons. Settings A and B are saved with the project.

Setting A active

Setting B active

Effect Presets

In the MediaBay – or with certain limits in the Save Preset dialog – you can assign attributes to presets which allow you to organize and browse them according to various criteria. Nuendo comes with categorized track and VST presets that you can use straight out of the box.

You can also preview effect presets before loading them which considerably speeds up the process of finding the right effect preset.

Effect presets can be divided into the following main categories:

- VST presets for a plug-in.

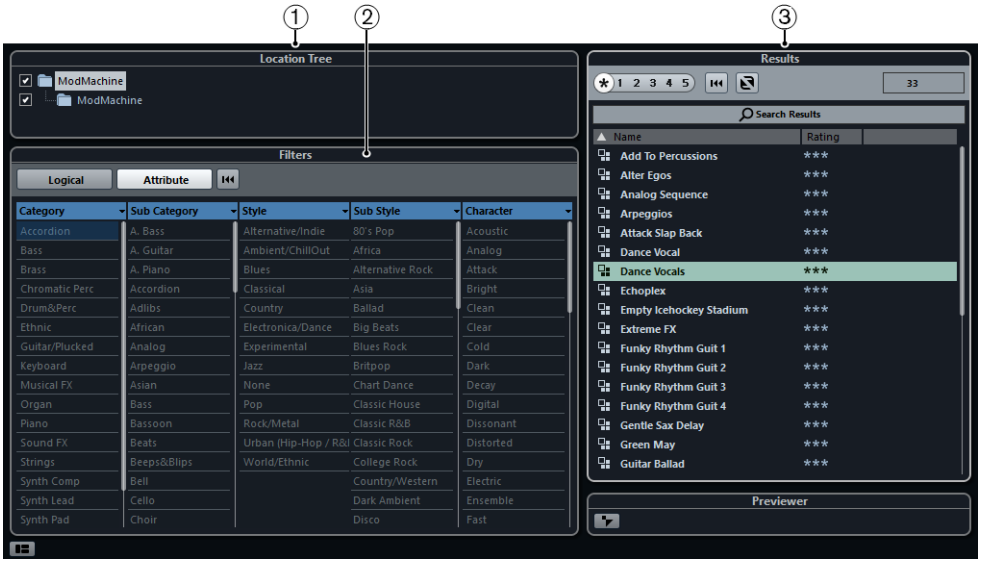
  These are plug-in parameter settings for a specific effect.

- Inserts presets that contain insert effect combinations.

  These can contain the whole insert effects rack with settings for each effect.

Presets Browser

The Presets browser contains the Results, the Filters and the Location Tree sections.



1) **Location Tree section**

   Shows the folder that is searched for preset files.

   To show the Location Tree section, click **Set Up Window Layout** and activate **Location Tree**. This is only available if **Filters** is also active.

2) **Filters section**

Shows the available preset attributes for the selected effect.

To show the Filters section, click **Set Up Window Layout** and activate **Filters**.

3) **Results section**

Lists the available presets for the selected effect.

Selecting Effect Presets

Most VST effect plug-ins come with a number of useful presets for instant selection.

PROCEDURE

1. Load an effect, either as a channel insert or into an FX channel.

   The control panel for the effect is displayed.

2. Perform one of the following actions to open the Presets browser:

   - Click in the preset field at the top of the control panel.
   - Click the button to the right of the preset field and select “Load Preset”.

   This opens the Presets browser.

   You can also open the Presets browser from the Inspector (Inserts tab) or the Channel Settings window.

3. In the Results section, select a preset from the list.

4. Activate playback to audition the selected preset.

   Step through the presets until you find the right sound. It may be helpful to set up cycle playback of a section to make comparisons between different preset settings easier.

5. When you have found the preset that you want, double-click on it (or click outside the Presets browser).

   The preset is applied.

   - To return to the preset that was selected when you opened the Presets browser, click the “Revert to Last Setting” button.

   NOTE

   The preset handling for VST 2 plug-ins is slightly different.

RELATED LINKS

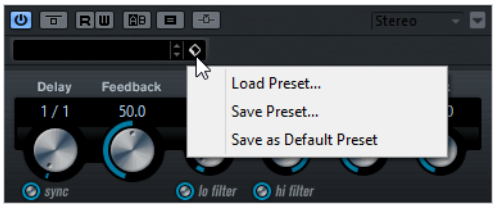
Earlier VST Effect Presets on page 463

Saving Effect Presets

You can save your effect settings as presets for further use.

PROCEDURE

1. Open the Preset Management pop-up menu.



2. Select **Save Preset**.

   The **Save Preset** dialog opens.

3. In the **New Preset** section, enter a name for the new preset.
4. Optional: Click the button at the bottom left to open the **Attribute Inspector** and save attributes for the preset.
5. Click **OK** to save the preset and exit the dialog.

RESULT

User-defined presets are saved in the following location:

- Windows: `\Users\<user name>\My Documents\VST3 Presets\<company>\<plug-in name>`
- Mac: `/Users/<user name>/Library/Audio/Presets/<company>/<plug-in name>`

NOTE

You cannot change the default folders, but you can add further subfolders inside the individual effect preset folders (by clicking the New Folder button).

RELATED LINKS

Attribute Inspector on page 622

Default Effect Presets

You can save a default effect preset with your parameter settings. This is loaded automatically when you open the effect.

- To save a default preset, open the Preset Management pop-up menu, and select **Save as Default Preset**.
- To recall a default preset, open the Presets browser and select **Default**. You can also open the plug-in context menu and select **Default Preset > Reset to Default Preset**.

Copying and Pasting Effect Presets

You can copy a plug-in preset and paste it in another instance of the same plug-in.

PROCEDURE

1. Open the plug-in context menu and select **Copy <plug-in name> Setting**.
2. Select another instance of the same plug-in, open the context menu and select **Paste <plug-in name> Setting**.

Earlier VST Effect Presets

Some VST 2.x plug-ins have presets in the old FX program/bank format (.fxp/.fxb).

To use all features, you must convert these presets to VST 3 presets. If you save new presets for the included VST 2 plug-ins, these will automatically be saved in the .vstpreset format.

IMPORTANT

All VST 2 presets can be converted to VST 3 presets.

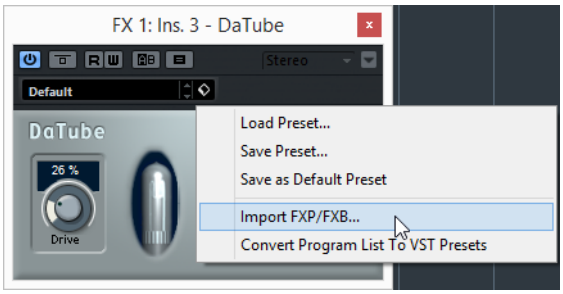
Converting Earlier VST Presets

PREREQUISITE

You have created your own .fxp/.fxb presets with a previous version of Nuendo (or any other VST 2 application).

PROCEDURE

1. Load any VST 2 effect you may have installed, and open the Preset Management pop-up menu.



2. Select **Import FXB/FXP**.
3. In the file dialog, locate the file and click Open.

   If you load a bank (.fxb), it will replace the current set of all effect programs. If you load a single program, it will replace the currently selected effect program only.

AFTER COMPLETING THIS TASK

You can convert the current program list to VST presets by opening the Preset Management pop-up menu and selecting **Convert Program List to VST Presets**.

After converting, the presets will be available in the Presets browser, and you can use the Attribute Inspector in the MediaBay to add attributes and audition the presets. The converted presets will be stored in the VST 3 Preset folder.

Saving Insert Presets

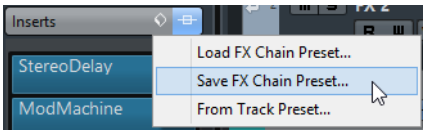
You can save the complete insert effect rack for a channel together with all parameter settings as an inserts preset. Inserts presets can be applied to audio, instrument, FX channel, or group tracks.

PROCEDURE

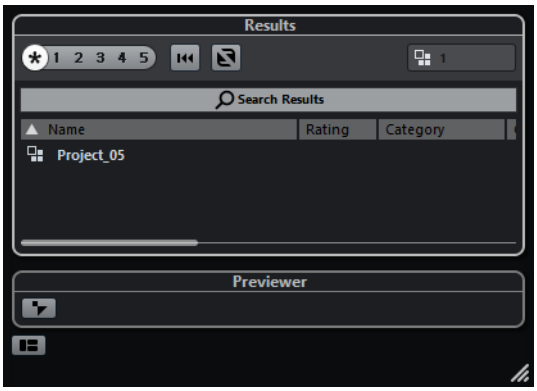
1. In the track list, select the track and in the Inspector, open the Inserts section.
2. Load a combination of insert effects and adjust the parameters (or select effect presets) for each effect.

3. At the top of the Inserts tab, click the Preset Management button to open the pop-up menu for the inserts and select “Save FX Chain Preset”.

   This can also be done from the Channel Settings window using the Preset Management button at the top of the Inserts section.



4. In the dialog that opens, type in a name for the preset.
5. Select the track (audio/group/instrument/FX channel) to which you want to apply the new preset.
6. On the Inserts tab, click the Preset Management button and select “Load FX Chain Preset”.



7. In the dialog that opens, select the preset that you created.

   The effects are loaded into the Insert slots of the new track.

NOTE

When loading insert combination presets, any plug-ins that were previously loaded for the track will be removed, regardless of whether these slots are used in the preset.

Extracting Insert Effect Settings from Track Presets

You can extract the effects used in a track preset and load them into your inserts rack.

PROCEDURE

1. On the Preset Management pop-up menu, select **From Track Preset**.
2. In the dialog, select an item in the list.

   The effects used in the track preset are loaded.

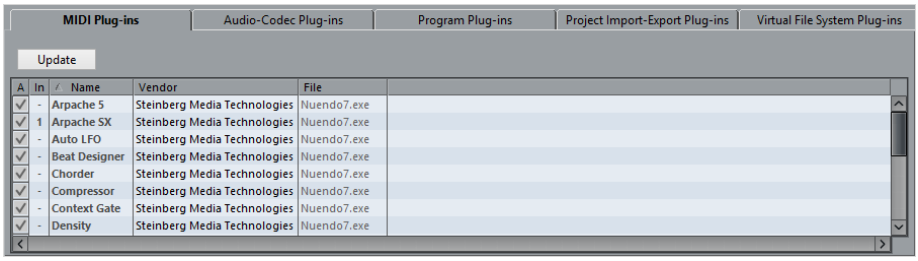
RELATED LINKS

Track Presets on page 167

Plug-In Information Window

The **Plug-in Information** window lists all the available MIDI plug-ins, audio-codec plug-ins, program plug-ins, project import-export plug-ins, and the virtual file system plug-ins.

- To open the **Plug-in Information** window, select **Devices > Plug-in Information**.



Update

Makes Nuendo re-scan the designated plug-in folders for updated plug-in information.

The following columns are available:

Instances

Indicates how many instances of the plug-in are currently used in Nuendo.

Name

The name of the plug-in.

Vendor

The manufacturer of the plug-in.

File

The name of the plug-in with extension.

Path

The path and name of the folder in which the plug-in file is located.

Category

Indicates the category of each plug-in.

Version

The version of the plug-in.

SDK

Shows with which version of the VST protocol a plug-in is compatible.

Managing Plug-Ins in the Plug-In Information Window

- To make it available for selection, activate the checkbox in the left column.

  Only the enabled plug-ins will appear on the effect selectors.

- To see where a plug-in is used, click in the Instances column.

  A pop-up opens and shows where each plug-in is used.

  NOTE

  A plug-in may be in use even if it is not enabled in the left column.

  You might for example have opened a project containing effects that are currently disabled on the menu. The left column only determines whether or not the plug-in is visible on the effect selectors.

Exporting Plug-In Information Files

You can save plug-in information as an XML file, for example for archiving purposes or troubleshooting.

- The plug-in information file contains information on the installed/available plug-ins, their version, vendor, etc.
- The XML file can then be opened in any editor application supporting the XML format.

NOTE

The export function is not available for program plug-ins.

PROCEDURE

1. In the **Plug-in Information** window, right-click in the middle of the window and select **Export**.

   A file dialog opens.
2. In the dialog, specify a name and location for the plug-in information export file.
3. Click **Save** to export the file.

Audio processing and functions

Background

Audio processing in Nuendo can be called “non-destructive”, in the sense that you can always undo changes or revert to the original versions. This is possible because processing affects audio clips rather than the actual audio files, and because audio clips can refer to more than one audio file.

This is how it works:

PROCEDURE

1. If you process an event or a selection range, a new audio file is created in the Edits folder, within your project folder.

   This new file contains the processed audio, while the original file is unaffected.

2. The processed section of the audio clip (the section corresponding to the event or selection range) then refers to the new, processed audio file.

   The other sections of the clip will still refer to the original file.

   - The original, unprocessed audio file can still be used by other clips in the project, by other projects or by other applications.
   - Since all edits are available as separate files, it is possible to undo any processing, at any point and in any order!

     This is done in the Offline Process History dialog.

RELATED LINKS

The Offline Process History dialog on page 489

Audio processing

You apply processing by making a selection and selecting a function from the Process submenu of the Audio menu.

Processing is applied according to the following rules:

- When events are selected in the Project window or the Audio Part Editor, the processing will be applied to these events only.

  Processing will only affect the clip sections that are referenced by the events.

- When an audio clip is selected in the Pool, the processing will be applied to the whole clip.
- When you have made a selection range, the processing will be applied to this range only.

  Other sections of the clip are not affected.

If you attempt to process an event that is a shared copy (i.e. the event refers to a clip that is used by other events in the project), you are asked whether you want to create a new version of the clip.

Select “New Version” if you want the processing to affect the selected event only. Select “Continue” if you want the processing to affect all shared copies.

Common settings and features

If there are any settings for the selected Audio processing function, these will appear when you select the function from the Process submenu. While most settings are specific for the function, some features and settings work in the same way for several functions.

The “More…” button

If the dialog has a lot of settings, some options may be hidden when the dialog opens.

- To reveal these, click the “More…” button.

- To hide the settings, click the button again (now labeled “Less…”).

The Preview, Process, and Cancel buttons

These buttons have the following functionality:

Preview button

Allows you to listen to the result of the processing with the current settings. Playback will continue repeatedly until you click the button again (the button is labeled “Stop” during Preview playback). You can make adjustments during Preview playback, but the changes are not applied until the start of the next “lap”. Some changes may automatically restart the Preview playback from the beginning.

NOTE

To start or stop previewing, you can also press [Space].

Process button

Performs the processing and closes the dialog.

NOTE

To perform the process, you can also press [Enter] or [Return].

Cancel button

Closes the dialog without processing.

Pre/Post-Crossfade

Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000 ms, the processing is applied gradually from the start of selection, reaching full effect 1000 ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

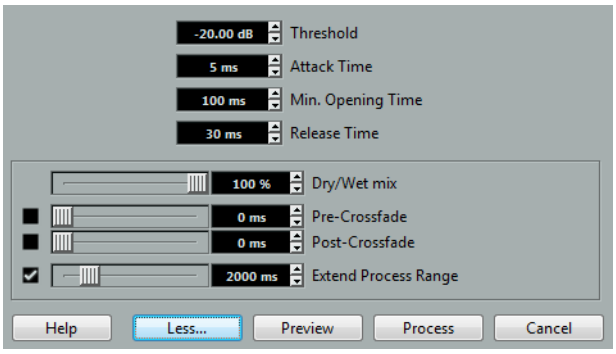
IMPORTANT

The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

Extend Process Range

When “Extend Process Range” is activated, you can specify which portions of audio to the left and right of the event borders are affected (provided that the event plays only a part of the audio clip, i.e. audio is available outside the event borders). For example, this allows you to enlarge the event even after applying the processing.

Note that this option works globally. When you activate it for one offline process, it stays activated for all further processing until you switch it off again. This only works if the entire audio event is selected (separately or as part of a selection range).

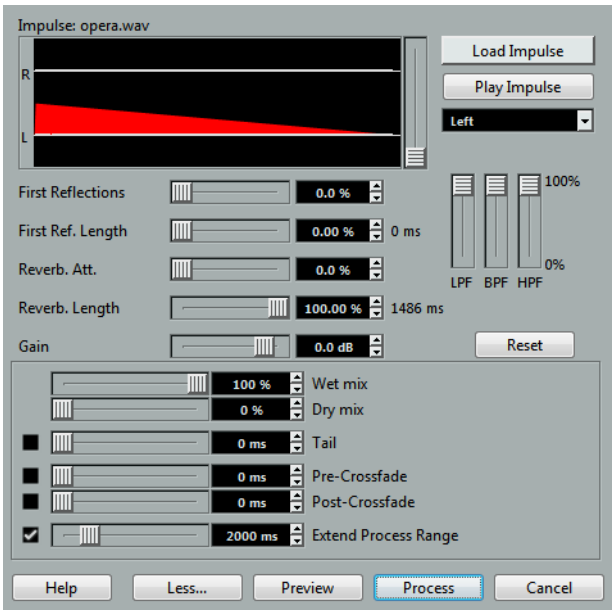


IMPORTANT

When you try to process an event whose clip is also used by another event, a warning message appears. To apply the processing as specified (i.e. beyond the event borders, click “New Version”.

Acoustic Stamp

The Acoustic Stamp function is a convolution tool, which allows you to apply room characteristics (reverb) to the audio. This is done by processing the audio signal according to an impulse response – generally a stereo or mono recording of a very short signal (the impulse) in a room or other location. As a result, the processed audio will sound as if it were played in the same location.



IMPORTANT

This function requires a lot of processing power, especially when using the Preview function. If you are working with long impulse response files or stereo files, you may find that Preview playback stutters or stops. In that case, it is better to process the material, listen to the result and modify it in the Offline Process History if necessary.

The dialog contains the following settings:

Impulse and Envelope display

This display shows the loaded impulse response (in white) and the Envelope (in red). You can zoom in vertically on the impulse response using the slider to the right of the display (this can be useful since impulse responses typically are very weak). Zooming does not affect the processing in any way.

Load Impulse button

Clicking the “Load Impulse” button allows you to load an impulse response file from disk. These are ordinary WAV or AIFF audio files, with a maximum duration of 12 seconds. The name of the currently loaded impulse response file is shown above the display.

A number of demonstration impulse response files are included in the Nuendo program folder.

For proper use of the Acoustic Stamp function, we recommend that you acquire files from a professional impulse response library.

Play Impulse button

Plays back the currently loaded impulse response.

Channel selector

If the currently loaded impulse response is a stereo file, this pop-up menu allows you to select whether the left channel, right channel or both (stereo) are used for the convolution process.

Envelope controls

The five sliders below the display are used for setting up the “reverb envelope”, that is, a gain curve modifying how the impulse response is applied over time, and thereby the reverb character. These settings are reflected in the red Envelope display above. The sliders have the following functionality:

- **First Reflections**
  A level control for the first section of the reverb (the length of which is set with the next parameter, see below). Usually, this governs the volume of the first reflection(s) of the reverb.
- **First Ref. Length**
  This determines the length of the First Reflections section (the level of which is controlled by the previous parameter). Set this so that it includes the first reflection in the impulse response (normally about 5% of the total length).
- **Reverb Att.**
  A level control for the end section of the reverb (the section after the First Reflections, see above).
- **Reverb Length**
  Governs the reverb time, in milliseconds.
- **Gain**
  Allows you to adjust the gain of the impulse response. This may be necessary for optimal results, since different impulse response files may be recorded at different levels.

Filter controls

The three sliders to the right allow you to tailor the tonal character of the processed sound. In essence, this is a graphic equalizer with three broad bands: the LPF slider governs the low frequency content, the BPF governs the midrange and the HPF governs the high frequency content.

- Setting a slider to 100% means that the corresponding filter is “fully open”.
- When all three sliders are set to 100%, the processed audio is not filtered at all.

Reset button

Sets all parameters in the upper section of the dialog to their default values.

Wet/Dry Mix

These two sliders allow you to specify the balance between wet (processed) and dry (original) signal in the resulting clip.

Normally the two sliders are “reverse-ganged”, so that raising the Wet mix slider lowers the Dry mix slider by the same amount. However, if you press [Alt]/[Option] and drag a slider, you can move it independently. This allows you to set 80% dry and 80% wet signal, for example. Be careful to avoid distortion.

Tail

This parameter allows you to “add space” after the original audio section, to avoid that the reverb tail is cut off. When the checkbox is activated, you can specify a tail length using the slider. The tail time is included when playing back with the Preview function, allowing you to find the appropriate tail length. A good value would be the Reverb Length value, displayed in ms to the right of the Reverb Length parameter.

Pre/Post-Crossfade

Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000ms, the processing is applied gradually from the start of selection, reaching full effect 1000ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

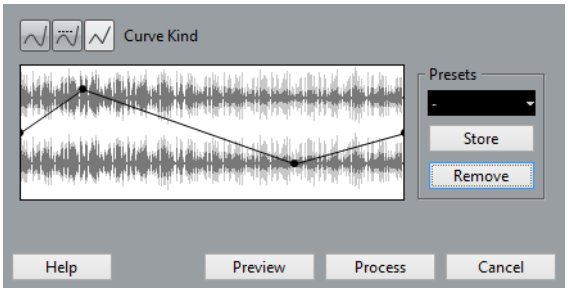
The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

RELATED LINKS

The Offline Process History dialog on page 489

Envelope

The Envelope function allows you to apply a volume envelope to the selected audio.



The dialog contains the following settings:

Curve Kind buttons

These determine whether the envelope curve consists of spline curve segments (left button), damped spline segments (middle button) or linear segments (right button).

Envelope display

Shows the shape of the envelope curve. The resulting waveform shape is shown in dark gray, with the current waveform shape in light gray. You can click on the curve to add points, and click and drag existing points to change the shape. To remove a point from the curve, drag it outside the display.

Presets

If you have set up an envelope curve that you may want to apply to other events or clips, you can save it as a preset by clicking the Store button.

- To apply a stored preset, select it from the pop-up menu.
- To rename the selected preset, double-click on the name and enter a new one in the dialog that opens.
- To remove a stored preset, select it from the pop-up menu and click Remove.

Fade In and Fade Out

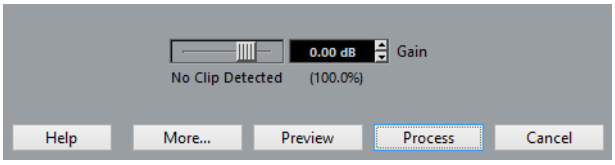
For a description of these functions, click on the related link.

RELATED LINKS

Fades, crossfades, and envelopes on page 274

Gain

Allows you to change the gain (level) of the selected audio.



The dialog contains the following settings:

Gain

This is where you set the desired gain, between -50 and +20 dB. The setting is also indicated below the Gain display as a percentage.

Clipping detection text

If you use the Preview function before applying the processing, the text below the slider indicates whether the current settings result in clipping (audio levels above 0 dB). If that is the case, lower the Gain value and use the Preview function again.

- If you want to increase the level of the audio as much as possible without causing clipping, use the Normalize function instead.

Pre/Post-Crossfade

Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000 ms, the processing is applied gradually from the start of selection, reaching full effect 1000 ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

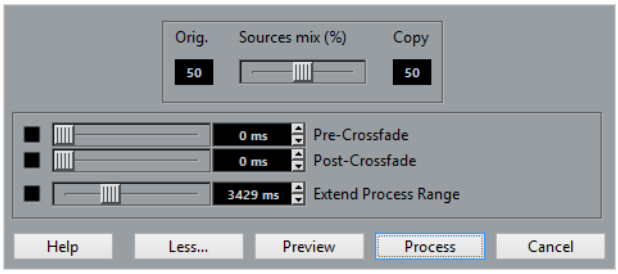
The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

RELATED LINKS

Normalize on page 478

Merge Clipboard

This function mixes the audio from the clipboard into the audio selected for processing, starting at the beginning of the selection.



IMPORTANT

For this function to be available, you need to have cut or copied a range of audio in the Sample Editor first.

The dialog contains the following settings:

Sources mix

Allows you to specify a mix ratio between the original (the audio selected for processing) and the copy (the audio on the clipboard).

Pre/Post-Crossfade

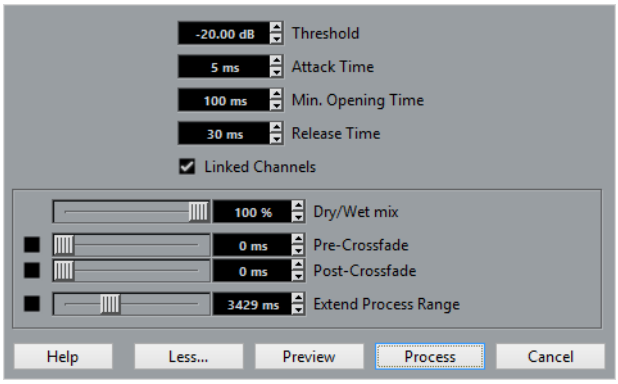
Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000 ms, the processing is applied gradually from the start of selection, reaching full effect 1000 ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

Noise Gate

Scans the audio for sections weaker than a specified threshold level and replaces them with silence.



The dialog contains the following settings:

Threshold

The level below which you want audio to be silenced. Levels below this value will close the gate.

Attack Time

The time it takes for the gate to open fully after the audio level has exceeded the threshold level.

Min. Opening Time

This is the shortest time the gate will remain open. If you find that the gate opens and closes too often when processing material that varies rapidly in level, try raising this value.

Release Time

The time it takes for the gate to close fully after the audio level has dropped below the threshold level.

Linked Channels

This is available for stereo audio only. When it is activated, the Noise Gate is opened for both channels as soon as one or both channels exceed the Threshold level. When Linked Channels is deactivated, the Noise Gate works independently for the left and right channel.

Dry/Wet mix

Allows you to specify a mix ratio between “dry” and processed sound.

Pre/Post-Crossfade

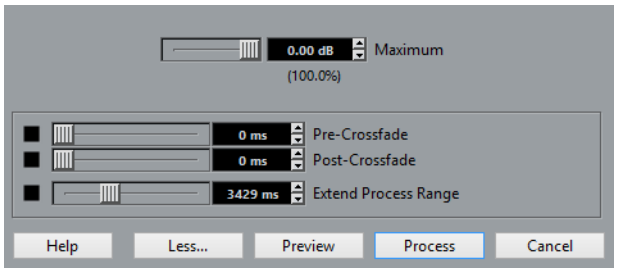
Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000ms, the processing is applied gradually from the start of selection, reaching full effect 1000ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

Normalize

The Normalize function allows you to specify the desired maximum level of the audio. It then analyzes the selected audio and finds the current maximum level. Finally it subtracts the current maximum level from the specified level and raises the gain of the audio by the resulting amount (if the specified maximum level is lower than the current maximum, the gain will be lowered instead). A common use for Normalizing is to raise the level of audio that was recorded at too low an input level.



The dialog contains the following settings:

Maximum

The desired maximum level for the audio, between -50 and 0dB. The setting is also indicated below the Gain display as a percentage.

Pre/Post-Crossfade

Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000ms, the processing is applied gradually from the start of selection, reaching full effect 1000ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

Phase Reverse

Reverses the phase of the selected audio, turning the waveform “upside down”.

The dialog contains the following settings:

Phase Reverse on

When processing stereo audio, this pop-up menu allows you to specify which channel(s) are phase-reversed.

Pre/Post-Crossfade

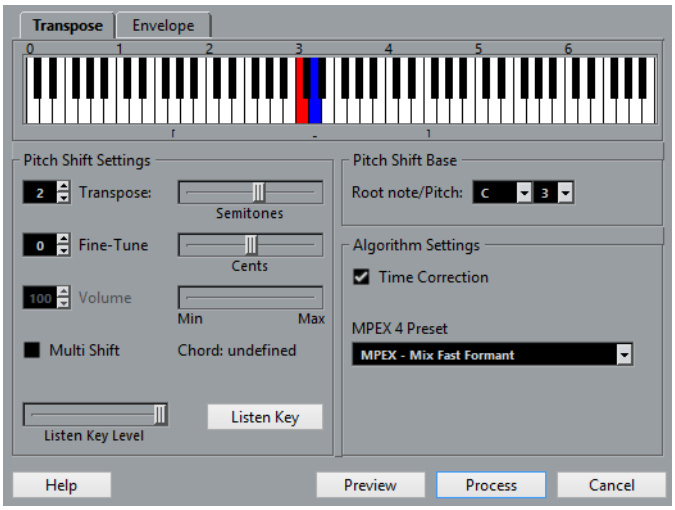
Some processing functions allow you to gradually mix the effect in or out. This is done with the Pre/Post-Crossfade parameters. For example, if you activate Pre-Crossfade and specify a value of 1000 ms, the processing is applied gradually from the start of selection, reaching full effect 1000 ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

Pitch Shift

This function allows you to change the pitch of the audio with or without affecting its length. You can also create “harmonies” by specifying several pitches or apply pitch shift based on a user specified envelope curve.



When the Transpose tab is selected, the dialog contains the following parameters:

Keyboard display

This is a graphic overview of the transposition setting. Here, you can specify the transpose interval in semitones.

- The root note is indicated in red.

  This has nothing to do with the actual key or pitch of the original audio, it just provides a way to display transpose intervals. You can change the root note by using the settings in the Pitch Shift Base section, or by pressing [Alt]/[Option] and clicking in the keyboard display.

- To specify a transpose interval, click on one of the keys.

  The key is indicated in blue, and the program plays test tones in the base pitch and transpose pitch to give you an audible confirmation.

- If “Multi Shift” is activated (see below), you can click on several keys to create “chords”.

  Clicking on a blue (activated) key removes it.

Pitch Shift settings

The “Semitones” and “Fine-Tune” settings allow you to specify the amount of pitch shift. You can transpose the audio ±16 semitones, and fine-tune it by ±200 cents (hundredths of semitones).

Volume/Amplitude

Allows you to lower the volume of the pitch-shifted sound.

Multi Shift

When this is activated, you can add several transpose values, creating multi-part harmonies. This is done by adding intervals in the keyboard display (see above). Note that you cannot use the Preview function in Multi Shift mode.

- If the intervals you add make up a standard chord, this chord is displayed to the right.

  Note, however, that to include the base pitch (the original, untransposed sound) in the processed result, you need to click the base key in the keyboard display as well, so that it is displayed in blue.

Listen Key/Chord button

Clicking this button plays a test tone pitched according to the activated interval key on the keyboard display. If “Multi Shift” is activated, this button is called “Listen Chord” and plays all activated intervals as a chord.

Pitch Shift Base

This allows you to set the root note (the red key in the keyboard display). It has nothing to do with the actual pitch, but is an aid for setting up intervals and chords.

Algorithm Settings

This is where you can make settings for the MPEX 4 algorithm.

For each quality setting you can choose between the regular setting and a setting where the formants are preserved. If you are processing vocal material, select the Preserve Formant setting in order to preserve the vocal characteristics of the pitch-shifted audio and to avoid a “chipmunk voice” effect.

Time Correction

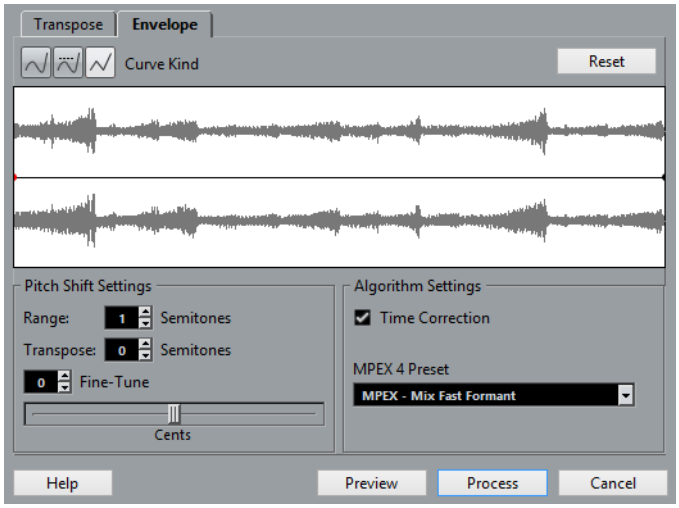
When this is activated, the pitch shift process will not affect the length of the audio. When this is deactivated, raising the pitch will shorten the audio section and vice versa, much like changing the playback speed on a tape recorder.

RELATED LINKS

About time stretch and pitch shift algorithms on page 502

Using envelope based Pitch Shift

When the “Envelope” tab is selected, you can specify an envelope curve on which the pitch shift will be based. This allows you to create pitchbend effects, pitch-shift different sections of the audio by different amounts, etc.



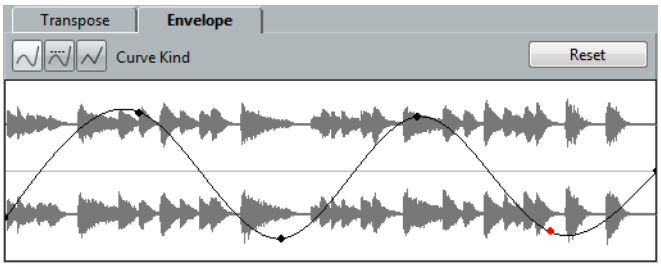
Envelope display

Shows the shape of the envelope curve over the waveform image of the audio selected for processing. Envelope curve points above the center line indicate positive pitch shift, while curve points below the center line indicate negative pitch shift. Initially, the envelope curve will be a horizontal, centered line, indicating zero pitch shift.

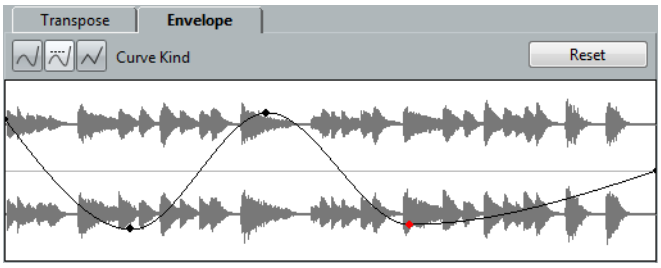
- You can click on the curve to add points, and click and drag existing points to change the shape. To remove a point from the curve, drag it outside the display.

Curve Kind

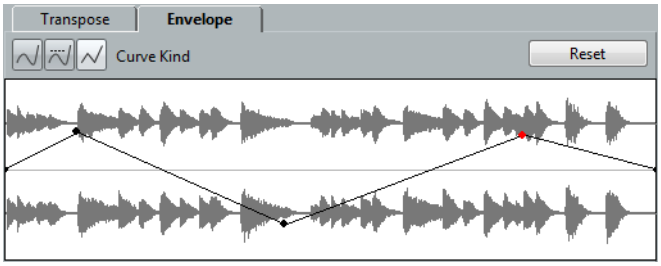
These buttons determine whether the envelope curve consists of spline curve segments (left button), damped spline segments (middle button) or linear segments (right button).



Spline curve segment envelope



The same envelope with damped spline segments selected



The same envelope with linear segments selected

Range

This parameter determines the vertical pitch range of the envelope. If set to “4”, moving a curve point to the top of the display corresponds to pitch shifting by +4 semitones. The maximum range is ±16 semitones.

Transpose and Fine-Tune

These parameters allow you to adjust the value of a curve point numerically:

1) Click on a curve point to select it.
   The selected point is shown in red.
2) Adjust the Transpose and Fine-Tune parameters to change the pitch of the curve point in semitones and cents, respectively.

Pitch Shift Mode

This is where you can make settings for the MPEX 4 algorithm.

For each quality setting you can choose between the regular setting and a setting where the formants are preserved. If you are processing vocal material, select the Preserve Formant setting in order to preserve the vocal characteristics of the pitch-shifted audio and to avoid a “chipmunk voice” effect.

RELATED LINKS

Algorithm Settings on page 480

Example

Let's say that you wish to create a pitchbend effect, so that the pitch is raised linearly by exactly 2 semitones in a specific part of the selected audio.

PROCEDURE

1. Remove all curve points by clicking the Reset button.
2. Select a linear curve by clicking the Curve Kind button to the right.
3. Make sure that the Range parameter is set to 2 semitones or higher.
4. Create a point where you want the pitchbend to start by clicking on the envelope line.

   Since this is the starting point for the pitchbend, you want its pitch to be zero (the envelope line should still be straight). If necessary, use the Fine-Tune parameter to set the curve point to 0 cents, because this point governs the start point, where you want the pitch transition to begin.
5. Create a new curve point at the horizontal position where you want the pitchbend to reach the full value.

   This curve point determines the rise time of the pitchbend effect, i.e. the further away from the starting point the new point is positioned, the longer it will take for the pitchbend to reach the full value, and vice versa.
6. With the second point still selected, use the Transpose and Fine-Tune parameters to set the pitch to exactly 2 semitones.
7. Create a new curve point to set the duration of the pitchbend, i.e. the time the pitch will remain transposed by 2 semitones.
8. Finally, create a point where you want the pitchbend to end.

   You do not have to create a new point if you are at the end of the audio file, since there is always an end point at the right side of the waveform display.
9. If necessary, make additional settings in the Pitch Shift Mode section.
10. Click Process.

    The pitchbend is applied according to the specified settings.

RELATED LINKS

Algorithm Settings on page 480

Remove DC Offset

This function will remove any DC offset in the audio selection. A DC offset is when there is too large a DC (direct current) component in the signal, sometimes visible as the signal not being visually centered around the "zero level axis". DC offsets do not affect what you actually hear, but they affect zero crossing detection and certain processing, and it is recommended that you remove them.

IMPORTANT

It is recommended that this function is applied to complete audio clips, since the DC offset (if any) is normally present throughout the entire recording.

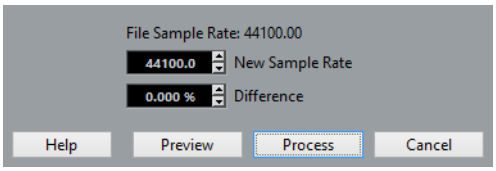
There are no parameters for this function. Note that you can check for DC Offset in an audio clip using the Statistics function.

RELATED LINKS

Statistics on page 499

Resample

The Resample function can be used for changing the length, tempo and pitch of an event.



The original sample rate of the event is listed in the dialog. Resample the event to a higher or lower sample rate by either specifying a sample rate or by specifying the difference (as a percentage value) between the original sample rate and the desired new one.

- Resampling to a higher sample rate will make the event longer and cause the audio to play back at a slower speed with a lower pitch.
- Resampling to a lower sample rate will make the event shorter and cause the audio to play back at a faster speed with a higher pitch.
- You can audition the result of the resampling by entering the desired value and clicking “Preview”.

  The event will then be played back as it will sound after the resampling.
- When you are satisfied with the preview result, click “Process” to close the dialog and apply the processing.

Reverse

Reverses the audio selection, as when playing a tape backwards. There are no parameters for this function.

Silence

Replaces the selection with silence. There are no parameters for this function.

Stereo Flip

This function works with stereo audio selections only. It allows you to manipulate the left and right channel in various ways.

The dialog contains the following parameters:

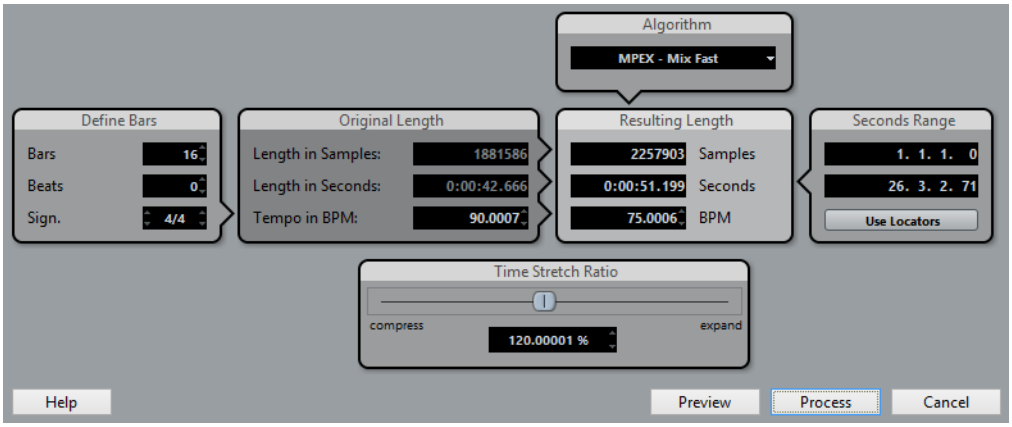
Mode

This pop-up menu determines what the function does:

- **Flip Left-Right**
  Swaps the left and right channel.
- **Left to Stereo**
  Copies the left channel sound to the right channel.
- **Right to Stereo**
  Copies the right channel sound to the left channel.
- **Merge**
  Merges both channels on each side for mono sound.
- **Subtract**
  Subtracts the left channel information from the right. This is typically used as a “Karaoke effect”, for removing centered mono material from a stereo signal.

Time Stretch

This function allows you to change the length and “tempo” of the selected audio without affecting the pitch.



The dialog contains the following parameters:

Define Bars section

In this section, you set the length of the selected audio and the time signature:

- **Bars**
  If you use the tempo setting (see below), specify the length of the selected audio here, in bars.
- **Beats**
  If you use the tempo setting, specify the length of the selected audio here, in beats.

- **Sign.**
  If you use the tempo setting, specify the time signature here.

Original Length section

This section contains information and settings regarding the audio selected for processing:

- **Length in Samples**
  The length of the selected audio, in samples.
- **Length in Seconds**
  The length of the selected audio, in seconds.
- **Tempo in BPM**
  If you are processing music, and know the actual tempo of the audio, you can enter it here as beats per minute. This makes it possible to time-stretch the audio to another tempo, without having to compute the actual time stretch amount.

Resulting Length section

These settings are used if you want to stretch the audio to fit within a specific time span or tempo. The values will change automatically if you adjust the Time Stretch Ratio (see below).

- **Samples**
  The desired length in samples.
- **Seconds**
  The desired length in seconds.
- **BPM**
  The desired tempo (beats per minute). For this to work, you have to know the actual tempo of the audio, and specify this (along with time signature and length in bars) in the Original Length section to the left.

Seconds Range section

These settings allow you to set the desired range for the time stretch.

- **Range**
  Allows you to specify the desired length as a range between two time positions.
- **Use Locators**
  Clicking the diamond-shaped button below the Range fields sets the Range values to the left and right Locator positions, respectively.

Time Stretch Ratio section

The Time Stretch Ratio determines the amount of time stretch as a percentage of the original length. If you use the settings in the Resulting Length section to specify the amount of time stretch, this value will change automatically.

Algorithm section

In this section you can select a time stretch algorithm. The pop-up menu contains various presets sorted into category submenus based on the underlying technology: élastique, MPEX, and Standard.

RELATED LINKS

About time stretch and pitch shift algorithms on page 502

Applying plug-ins

You can add plug-in effects in realtime during playback. However, sometimes it is useful to “permanently” apply effects to one or several selected events.

This is done in the following way:

PROCEDURE

1. Make a selection in the Project window, the Pool or an editor.
   Effects are applied according to the same rules as Processing.
2. Select “Plug-ins” from the Audio menu.
3. Select the desired effect from the submenu.
   The Process Plug-in dialog opens.

RELATED LINKS

Audio Effects on page 439
Common settings and features on page 469

About stereo and mono

If you are applying an effect to mono audio material, only the left side of the effect’s stereo output will be applied.

The process plug-in dialog

The upper section of the process plug-in dialog contains the effect parameters of the selected plug-in. For details on the parameters of the included plug-ins, see the separate PDF document “Plug-in Reference”.

The process plug-in dialog for the StudioChorus effect

The lower section of the dialog contains settings for the actual processing. These are common to all plug-ins.

- If the lower section is hidden, click the “More…” button to display it.

  Clicking the button again (now labeled “Less…”) will hide the lower section.

The following settings and functions are available in the common, lower section of the dialog:

Wet mix/Dry mix

These two sliders allow you to specify the balance between wet (processed) and dry (original) signal in the resulting clip.

Normally the two sliders are “reverse-ganged”, so that raising the Wet mix slider lowers the Dry mix slider by the same amount. However, if you press [Alt]/[Option] and drag a slider, you can move it independently. This allows you to set 80% dry and 80% wet signal, for example. Be careful to avoid distortion.

Tail

This parameter is useful if you are applying an effect that adds material after the end of original audio (such as reverb and delay effects). When the checkbox is activated, you can specify a tail length using the slider. The tail time is included when playing back with the Preview function, allowing you to find the appropriate tail length.

Pre/Post-Crossfade

These settings allow you to gradually mix the effect in or out. For example, if you activate Pre-Crossfade and specify a value of 1000 ms, the effect is applied gradually from the start of selection, reaching full effect 1000 ms after the start. Similarly, if you activate Post-Crossfade, the processing is gradually removed, starting at the specified interval before the end of the selection.

IMPORTANT

The sum of the Pre-Crossfade and Post-Crossfade times cannot be larger than the length of the selection.

Preview button

Allows you to listen to the result of the processing with the current settings. Playback will continue repeatedly until you click the button again (the button is labeled “Stop” during Preview playback). You can make adjustments during Preview playback, but the changes are not applied until the start of the next “lap”. Some changes may automatically restart the Preview playback from the beginning.

You can change the effect settings during Preview playback if needed.

NOTE

To start or stop previewing, you can also press [Space].

Process button

Applies the effect and closes the dialog.

NOTE

To perform the process, you can also press [Enter] or [Return].

Cancel button

Closes the dialog without applying the effect.

The Offline Process History dialog

If you want to remove or modify some or all processing from a clip, this can be done in the Offline Process History dialog. Processing that can be modified in the Offline Process History dialog includes the functions on the Process menu, any applied plug-in effects, and Sample Editor operations such as Cut, Paste, Delete and drawing with the Draw tool.

NOTE

Due to the clip-file relationship, it is even possible to modify or remove some processing “in the middle” of the Process History, while keeping later processing! This feature depends on the type of processing performed.

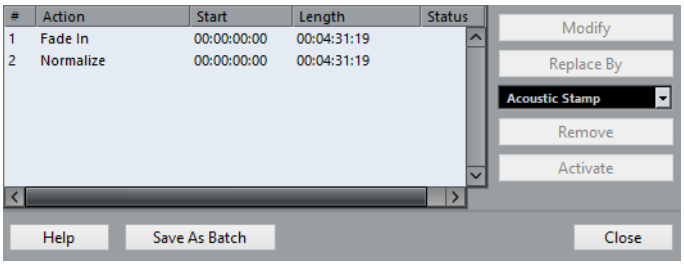
PROCEDURE

1. Select the clip in the Pool or one of its events in the Project window.

   You can see which clips have been processed by checking the Status column in the Pool – the waveform symbol indicates that processing or effects have been applied to the clip.

2. Select “Offline Process History…” from the Audio menu.

   The Offline Process History dialog opens.



   The left part of the dialog contains a list of all processing you have added to the clip, with the most recent operations at the bottom of the list. The “Start” and “Length” columns indicate which section of the clip was affected by each operation. The “Status” column indicates if the operation can be modified or undone.

3. Locate the operation you want to edit and select it by clicking on it in the list.

   - To modify the settings of the selected processing, click the “Modify” button.

     This opens the dialog for the processing function or applied effect, allowing you to change the settings. This works just as when you applied the processing or effect the first time.

   - To replace the selected operation with another processing function or effect, select the desired function from the pop-up menu and click the “Replace By” button.

     If the selected function has settings, a dialog will appear as usual. The original operation will then be removed and the new processing will be inserted in the Offline Process History.

   - To remove the selected operation, click the “Remove” button.

     The processing is removed from the clip.

   - To undo the selected operation and remove the processing from the clip click the “Deactivate” button.

     The processing is removed from the clip, but the operation remains in the list. To redo the operation and apply the processing again, click the button, now renamed to “Activate”, again.

   - To save the list of processing operations as a Batch Process, click the “Save As Batch” button.

4. Click “Close” to close the dialog.

RELATED LINKS

Restrictions on page 491
Status on page 575
Batch Processing on page 491

Restrictions

- If there are no settings for the processing function, you cannot modify it.
- If you have applied processing that changes the length of the clip (such as Cut, Insert or Time Stretch), you can only remove this if it is the most recent processing in the Offline Process History (at the bottom of the list in the dialog). If an operation cannot be removed or modified, this is indicated by an icon in the “Status” column. Also, the corresponding buttons will be grayed out.
- The list must contain at least two processing operations in order to be saved as a Batch Process.

RELATED LINKS

Batch Processing on page 491

Batch Processing

Nuendo features a Batch Processing function that lets you apply a chain of audio processing to one or several events in one go – in either the Project window or the Pool. Batch Processing is based on operations in the Offline Process History dialog, described above. That is, the list of applied processes in this dialog is what can be made to constitute a batch process.

Batch Processing is therefore a convenient way to apply the same effects with the same settings to several audio events in a project.

It can also be used to “store” effect settings for future use. You may for example have performed a series of elaborate audio processing with a good result, and want to retain the particular combination and settings of effects you applied, so that you may quickly and easily apply them again to other events in the future.

To set up a batch process, proceed as follows:

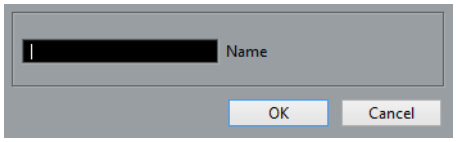
PROCEDURE

1. Apply the desired processing to an audio event or selection range in the project.

   Note that you must apply at least two audio processes to be able to set up a batch process.

   From here, there are two ways to go:

   - Pull down the Audio menu, and from the Batch Processes submenu, select "Create from Process History…", type in a name for the batch process in the dialog that opens, and click OK.

   - Pull down the Audio menu and select "Offline Process History".

     The Offline Process History dialog opens. In this dialog you can modify settings or remove operations as desired.

2. In the Process History Dialog, click "Save As Batch", and then type in a name for the batch process in the dialog that opens and click OK.

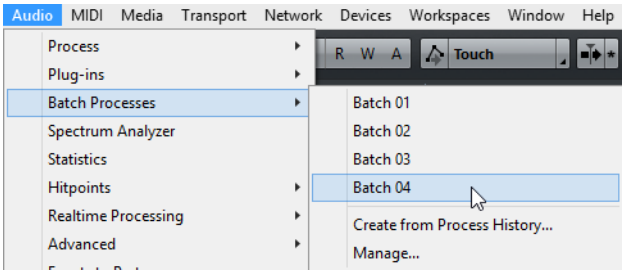
   Regardless of which of the above two methods you use, the batch process is now saved and available for use:

3. In the Project window, select all the audio events you want to process.

   You can also make a selection range that spans multiple tracks and batch process the selection for all the audio events.

4. Pull down the Audio menu and open the Batch Processes submenu.

   At the top of the menu you can now find the name of the batch process you created. The menu will list the names of any batch processes you create, until you delete them (see below).

5. Select the batch process you want to apply from the menu.

   All the selected events will now be processed accordingly.

   NOTE

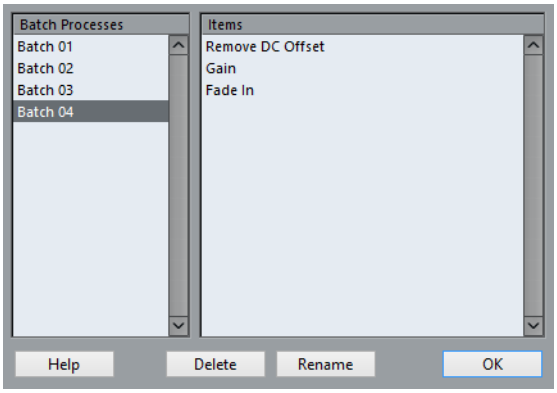
   Note that even if you clear the Offline Process History dialog of all the operations that make up a batch process, this will not affect the saved batch process. It will still contain and perform the operations on which it was based when created.

RELATED LINKS

The Offline Process History dialog on page 489

Managing Batch Processes

You can delete and rename created batch processes in the Manage Batch Processes dialog.



- Open the Audio menu and select “Manage…” from the Batch Processes submenu to open the Manage Batch Processes dialog.

  The created batch processes are listed in the left column, and the operations each batch process contains are listed in the right column.

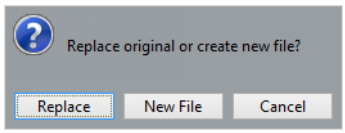
- To remove a batch process, just select it in the list and click “Delete”.
- To change the name of a batch process, select it in the list and click “Rename” and enter the new name.

Freeze Edits

The Freeze Edits function on the Audio menu allows you to make all processing and applied effects permanent for a clip:

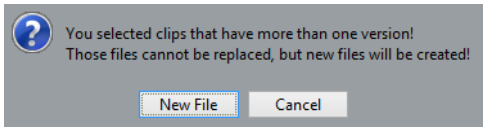
PROCEDURE

1. Select the clip in the Pool or one of its events in the Project window.
2. Select “Freeze Edits…” from the Audio menu.
   - If there is only one edit version of the clip (no other clips refer to the same audio file), the following dialog will appear:

     If you select “Replace”, all edits will be applied to the original audio file (the one listed in the clip’s Path column in the Pool). If you select “New File”, the Freeze Edits operation will create a new file in the Audio folder within the project folder (leaving the original audio file unaffected).

- If the selected clip (or the clip played by the selected event) has several edit versions (i.e. there are other clips referring to the same audio file), the following alert will appear:



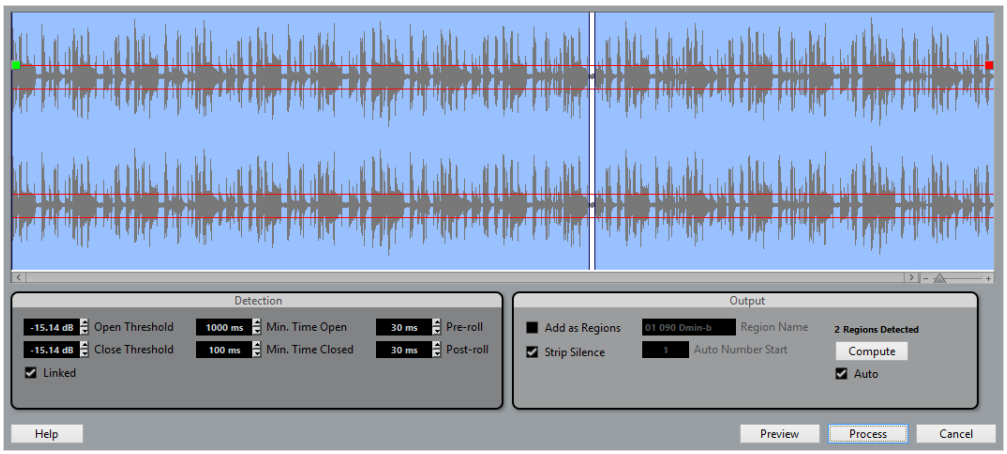
As you can see, you do not have the option to Replace the original audio file in this case. This is because that audio file is used by other clips. Select “New File” to have a new file created in the Audio folder within the project folder.

IMPORTANT

After a Freeze Edits, the clip refers to a new, single audio file. If you open the Offline Process History dialog for the clip, the list will be empty.

Detect Silence

The Detect Silence function searches for silent sections in an event and either splits the event, removing the silent parts from the project, or creates regions corresponding to the non-silent sections.



- To open the Detect Silence dialog, select one or several audio events in the Project window or the Audio Part Editor. On the Audio menu, open the Advanced submenu and select “Detect Silence”.

  If you select more than one event, the Detect Silence dialog allows you to process the selected events successively with individual settings or to apply the same settings to all selected events at once.

The settings have the following functionality:

Open Threshold

When the audio level exceeds this value, the function “opens”, i.e. lets the sound pass. Audio material below the set level is detected as “silence”. Set this value low enough to open when a sound starts, but high enough to remove unwanted noise during “silent” sections.

Close Threshold

When the audio level drops below this value, the function “closes”, i.e. sounds below this level are detected as “silence”. This value cannot be higher than the Open Threshold value. Set this value high enough to remove unwanted noise during “silent” sections.

Linked

If this checkbox is activated, the Open and Close Threshold values are always set to the same value.

Min. time open

Determines the minimum time that the function will remain “open” after the audio level has exceeded the Open Threshold value.

If the audio contains repeated short sounds, and you find that this results in too many short “open” sections, try raising this value.

Min. time closed

Determines the minimum time that the function will remain “closed” after the audio level has dropped below the Close Threshold value.

Set this to a low value to avoid removing sounds.

Pre-roll

Allows you to cause the function to “open” slightly before the audio level exceeds the Open Threshold value. In other words, the start of each “open” section is moved to the left according to the time you set here.

This is useful to avoid removing the attack of sounds.

Post-roll

Allows you to cause the function to “close” slightly after the audio level drops below the Close Threshold value.

This is useful to avoid removing the natural decay of sounds.

Add as Regions

“Add as Regions” will create regions according to the non-silent sections.

If you activate the “Add as Regions” option, you can specify a name for the regions in the Region Name field. In addition to the name, the regions will be numbered, starting with the number specified in the “Auto Number Start” field.

Strip Silence

“Strip Silence” will split the event at the beginning and end of each non-silent section, and remove the silent sections in between.

Process all selected Events

If you have selected more than one event, you can activate the “Process all selected Events” checkbox to apply the same settings to all selected events.

Compute

The audio event is analyzed, and the waveform display is redrawn to indicate which sections are considered “silent” according to your settings. Above the Compute button, the number of detected regions is displayed.

Auto

If you activate the Auto checkbox next to the Compute button, the audio event is analyzed (and the display is updated) automatically every time you change the settings in the Detection section of the dialog. Deactivate this option when you are working with very long files, as this process might take some time.

Adjustments in the waveform display

The upper part of the dialog displays a waveform image of the selected audio event. In case you have selected several audio events, the waveform of the event that you have selected first is shown.

You can make the following adjustments:

- With the zoom slider below the waveform to the right, zoom in and out on the waveform.

  You can also click in the waveform, keep the mouse button pressed, and move the mouse for zooming. Move the mouse down to zoom in and move it up to zoom out.

- If you have zoomed in on the waveform, it may not be completely visible anymore. In this case, the scrollbar to the left of the zoom slider allows you to scroll through the waveform.

  You can also use the mouse wheel for scrolling through the waveform.

- If the Linked option in the Detection section is deactivated, you can use the green square at the beginning and the red square at the end of the audio file to graphically adjust the Open and Close Threshold values (respectively). When “Linked” is activated, you can use either square to adjust both values.

  The Open and Close Threshold values in the Detection section reflect these changes.

Making settings and processing

The lower part of the Detect Silence dialog provides settings for the detection and processing of “silent” sections.

PROCEDURE

1. Adjust the settings in the Detection section to the left.
2. Click the Compute button.

   The audio event is analyzed, and the waveform display is redrawn to indicate which sections are considered “silent” according to your settings. Above the Compute button, the number of detected regions is displayed.

3. Click “Preview” to listen to the result.

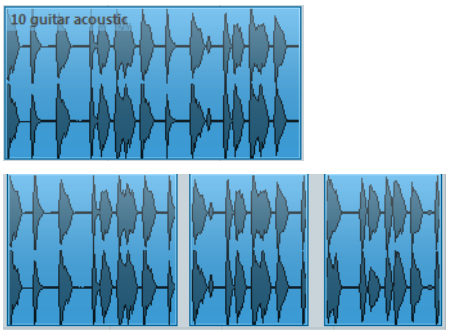
   The event is played back repeatedly in its entire length, but with the “closed” sections silenced.

4. Adjust the settings in the Detection section until you are satisfied with the result.

5. In the Output section, activate the “Add as Regions” or the “Strip Silence” option, or both.

6. Click the Process button.

   The event is split and/or regions are added.



NOTE

If you have selected more than one event and did not activate the “Process all selected Events” option in the Output section, the dialog opens again after processing, allowing you to make separate settings for the next event.

The Spectrum Analyzer

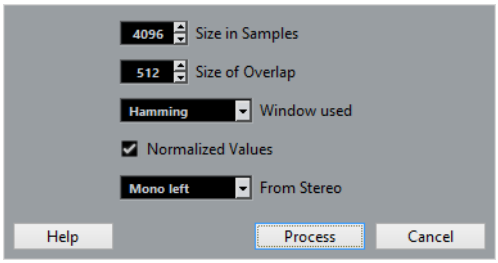
This function analyzes the selected audio, computes the average “spectrum” (level distribution over the frequency range) and displays this as a two-dimensional graph, with frequency on the x-axis and level on the y-axis.

PROCEDURE

1. Make an audio selection (a clip, an event or a range selection).

2. Select “Spectrum Analyzer” from the Audio menu.

   A dialog with settings for the analysis appears.



The default values give good results in most situations, but you can adjust the settings if you like:

- **Size in Samples**

  The function divides the audio into “analysis blocks”, the size of which is set here. The larger this value, the higher the frequency resolution of the resulting spectrum.

- **Size of Overlap**

  The overlap between each analysis block.

- **Window used**

  Allows you to select which window type is used for the FFT (Fast Fourier Transform, the mathematical method used for computing the spectrum).

- **Normalized Values**

  When this is activated, the resulting level values are scaled, so that the highest level is displayed as "1" (0 dB).

- **From Stereo**

  When analyzing stereo material, there is a pop-up menu with the following options:

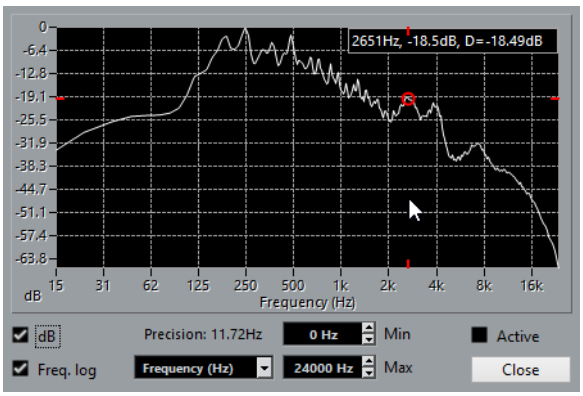
  Mono mix – the stereo signal is mixed to mono before analyzing.

  Mono left/right – the left or right channel signal is used for analysis.

  Stereo – both channels are analyzed (two separate spectrums will be displayed).

3. Click the Process button.

   The spectrum is computed and displayed as a graph.



4. You can adjust the display with the settings in the display window:

   - **dB**

     When this is activated, the vertical axis shows dB values. When it is deactivated, values between 0 and 1 are shown.

   - **Freq. log**

     When this is activated, frequencies (on the horizontal axis) are displayed on a logarithmic scale. When it is deactivated, the frequency axis is linear.

   - **Precision**

     Indicates the frequency resolution of the graph. This value cannot be changed here, but is governed by the Size in Samples setting in the previous dialog.

   - **Frequency/Note**

     Allows you to select whether you want the frequencies to be displayed in Hertz or with note names.

   - **Min.**

     Sets the lowest frequency shown in the graph.

   - **Max.**

     Sets the highest frequency shown in the graph. By adjusting the Min and Max values, you can take a closer look at a smaller frequency range.

- **Active**

  When this is activated, the next Spectrum Analysis will appear in the same window. When deactivated, new Spectrum Analysis results will appear in separate windows.

5. If you move the mouse pointer over the graph, a cross-hair cursor follows the graph curve and the display in the upper right corner shows the frequency/note and level at the current position.

   To compare the level between two frequencies, move the pointer to one of the frequencies, right-click once and move the pointer to the second frequency. The delta value (the difference in level between the current position and the right-click position) is displayed in the upper right corner (labeled “D”).

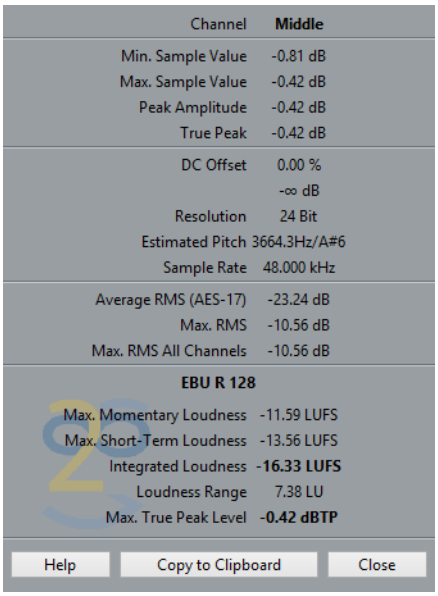
   - If you analyze stereo audio and selected the “Stereo” option in the first dialog, the graphs for the left and right channel are superimposed in the display, with the left channel graph in white and the right channel graph in yellow.

     The display in the upper right corner shows the values for the left channel – to see the right channel values, hold down [Shift]. An “L” or “R” is displayed to indicate which channel values are shown.

6. You can leave the window open or close it by clicking the “Close” button.

   If you leave it open and the “Active” checkbox is ticked, the result of the next Spectrum Analysis will be displayed in the same window.

Statistics



The Statistics function on the Audio menu analyzes the selected audio (events, clips, or range selections) and displays a window with the following information:

Channel

The name of the analyzed channel.

Min. Sample Value

The lowest sample value in dB.

Max. Sample Value

The highest sample value in dB.

Peak Amplitude

The largest amplitude in dB.

True Peak

The maximum absolute level of the audio signal waveform in the continuous time domain.

DC Offset

The amount of DC Offset as a percentage and in dB.

Resolution

The current calculated audio resolution.

Estimated Pitch

The estimated pitch.

Sample Rate

The sample rate.

Average RMS (AES-17)

The average loudness in accordance with the AES-17 standard.

Max. RMS

The highest RMS value.

Max. RMS All Channels

The highest RMS value of all channels.

Max. Momentary Loudness

The maximum value of all momentary loudness values, based on a time window of 400ms. The measurement is not gated.

Max. Short-Term Loudness

The maximum value of all short-term loudness values, based on a time window of 3s. The measurement is not gated.

Integrated Loudness

The average loudness over the whole title in LUFS (Loudness Unit, referenced to Full Scale) in accordance with EBU R-128 that recommends to normalize audio at -23LUFS (±1LU).

Loudness Range

The dynamic range over the whole title in LU (Loudness Units). This value allows you to see if dynamic processing is needed.

Max. True Peak Level

The maximum value of the audio signal waveform in the continuous time domain.

RELATED LINKS

Remove DC Offset on page 483

Measuring Loudness

The loudness track allows you to record and display the short-term loudness as a curve in the Project window.

After calculating the loudness, you can:

- Adjust the Visible loudness by clicking on the values displayed to the right of the track list, and dragging the slider that appears up or down.
- Display the loudness level in LU by clicking on the LUFS button.
- Reset the loudness curve display on the loudness track by clicking the “Clear Loudness Curve” button.

Adding the loudness track and enabling the loudness calculation

PROCEDURE

1. Open the Project menu and select Loudness from the “Add Track” submenu.

   A loudness track is added, and the EBU128 reference loudness level of -23LUFS (0 LU) displayed as a red line. There can only be one loudness track in a project.

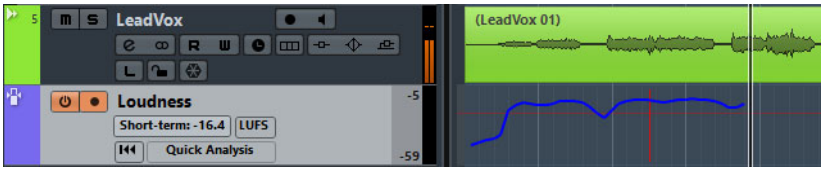
2. In the track list for the loudness track, activate the Activate Loudness Calculation button.

   By default, Loudness Calculation is deactivated for reasons of performance.

Creating a loudness curve in real-time during playback

PROCEDURE

1. Activate the “Enable Recording of Loudness Curve” button.
2. Click the Play button to start playback.

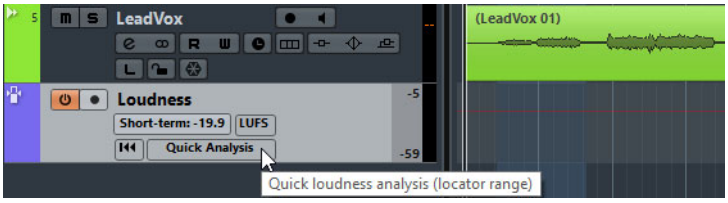


The short-term loudness level is measured in real-time at the cursor position, and the corresponding loudness curve is written to the loudness track.

Creating a loudness curve for a defined section using off-line processing

PROCEDURE

1. Set up the left and right locators to encompass the section that you want to analyze.
2. Click the Quick Analysis button.



The loudness curve is created for the defined section.

About time stretch and pitch shift algorithms

In Nuendo, time stretching and pitch shifting algorithms are used for numerous operations (e.g. the Time Stretch and Pitch Shift offline processes, in the Sample Editor, or by the Flatten function). Depending on the feature, some or all of the following algorithm presets are available.

élastique

The élastique algorithm is suited for both polyphonic and monophonic material. The algorithm has three modes, and there are three presets for each mode.

The following modes are available:

- élastique Pro – This mode offers the best audio quality, without formant preservation.
- élastique Pro Formant – This is the same as the Pro mode, but including formant preservation.
- élastique efficient – This mode requires less computing powers, but has a lower audio quality than the Pro modes.

These modes are available with the following variants:

- Time – Timing accuracy is favored over pitch accuracy.
- Pitch – Pitch accuracy is favored over timing accuracy.
- Tape – The pitch shift is locked to the time stretch (as when playing back a tape with varying speed). Stretching the audio material to a longer duration automatically decreases its pitch. This variant has no effect when used in combination with event transpose or the transpose track.

MPEX

MPEX is an alternative high-quality algorithm.

You can choose between the following quality settings:

MPEX – Preview Quality

Use this mode only for preview purposes.

MPEX – Mix Fast

This mode is a very fast mode for preview. This works best with composite music signals (mono or stereo material).

MPEX – Solo Fast

Use this mode for single instruments (monophonic material) and voice.

MPEX – Solo Musical

Same as above but higher quality.

MPEX – Poly Fast

Use this for processing monophonic and polyphonic material. This is the fastest setting that gives still very good results. You can use this for drum loops, mixes, chords.

MPEX – Poly Musical

Use this for processing monophonic and polyphonic material. This is the recommended MPEX default quality setting. You can use this for drum loops, mixes, chords.

MPEX – Poly Complex

This high quality setting is quite CPU-intensive and should be used only when processing difficult material or for stretch factors above 1.3.

NOTE

When applying the Pitch Shift process, you can choose between the regular setting and a setting where the formants are preserved for each quality setting.

Standard

The Standard algorithm is optimized for CPU efficient realtime processing.

The following presets are available:

Standard – Drums

This mode is best for percussive sounds, because it does not change the timing of your audio. Using this option with certain tuned percussion instruments may lead to audible artifacts. In this case, try the Mix mode as an alternative.

Standard – Plucked

Use this mode for audio with transients and a relatively stable spectral sound character (e.g. plucked instruments).

Standard – Pads

Use this mode for pitched audio with slower rhythm and a stable spectral sound character. This minimizes sound artifacts, but the rhythmic accuracy is not preserved.

Standard – Vocals

This mode is suitable for slower signals with transients and a prominent tonal character (e.g. vocals).

Standard – Mix

This mode preserves the rhythm and minimizes the artifacts for pitched material that does not meet the above criteria (i.e. with a less homogenous sound character).

This preset is selected by default for audio that is not categorized.

Standard – Custom

This preset allows you to manually tweak the time stretching parameters (see below). By default, the settings that are shown when you open the dialog are those of the last preset used (except if the Solo preset has been selected, see below).

Standard – Solo

This mode preserves the timbre of the audio. Only use it for monophonic material (solo woodwind/brass instruments or solo vocals, monophonic synths or string instruments that do not play harmonies).

If you select the “Standard – Custom” option, a dialog opens where you can manually adjust the three parameters that govern the sound quality of the time stretching:

Grain size

The standard time-stretching algorithm splits the audio into small pieces called “grains”. This parameter determines the size of the grains. For material with many transients, use low grain size values for best results.

Overlap

Overlap is the percentage of the whole grain that will overlap with other grains. Use higher values for material with a stable sound character.

Variance

Variance is also a percentage of the whole length of the grains, and sets a variation in positioning so that the overlapping area sounds smooth. A Variance setting of 0 will produce a sound akin to time stretching used in early samplers, whereas higher settings produce more (rhythmic) “smearing” effects but less audio artifacts.

Limitations

Applying time stretching or pitch shifting to audio material can lead to a degradation in audio quality and to audible artifacts. The result depends on many factors, such as the source material, the particular stretch and pitch operations applied, and the selected audio algorithm preset.

As a rule of thumb, smaller changes in pitch or duration cause less degradation. However, there are additional issues one should be aware of when working with time stretching and pitch shifting algorithms.

NOTE

In rare cases, editing warped audio events may cause discontinuities at the edit points. You can then try to move the edit point to a different position or bounce the audio event prior to editing.

Reverse playback and scrubbing

Most of the algorithms used for time stretching and pitch shifting only support forward playback. Reverse playback or scrubbing of warped audio events can lead to recurring artifacts in the playback.

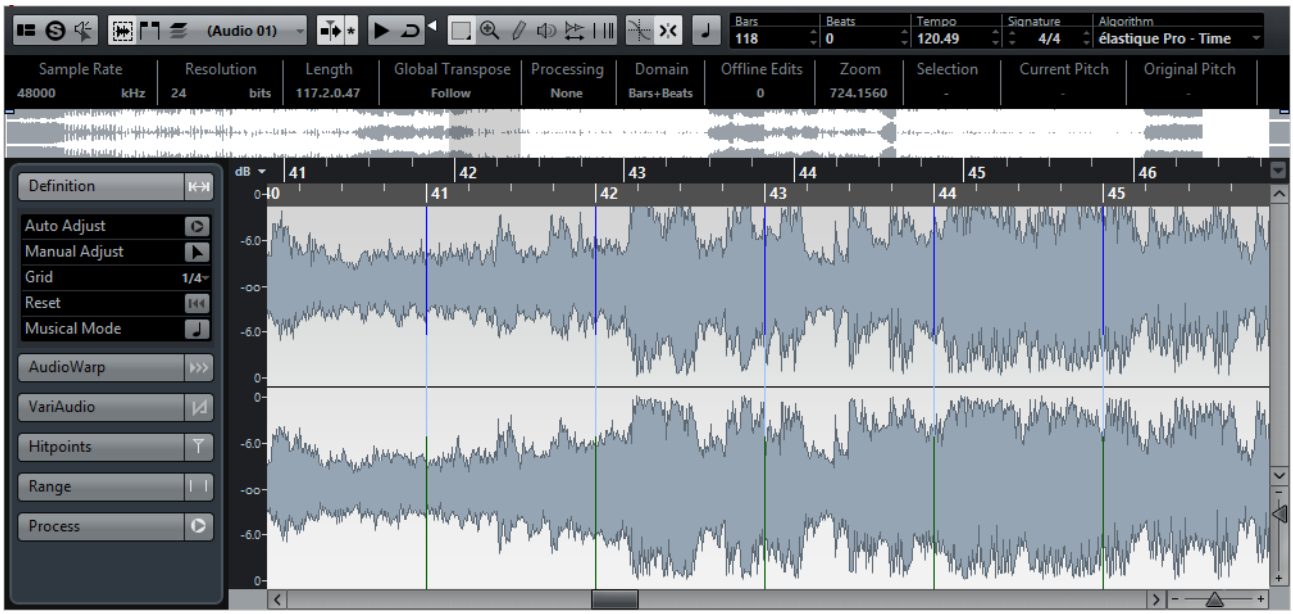
Pitch and stretch factor limitations

Some algorithms may put limitations on the maximum degree of time stretching or pitch shifting supported.

Sample Editor

Window overview

The Sample Editor allows you to view and manipulate audio by cutting and pasting, removing, or drawing audio data, and by processing audio. This editing is “non-destructive”: The actual file will remain untouched so that you can undo modifications or revert to the original settings at any time.



The Sample Editor also contains most of the realtime time stretching functions in Nuendo. These can be used to match the tempo of audio to the project tempo.

Another special feature of the Sample Editor is hitpoint detection. Hitpoints allow you to create audio slices, which can be useful in many situations, for example, if you want to change the tempo without introducing artifacts.

The VariAudio features allow you to edit monophonic vocal recordings in pitch and time, as easily as editing MIDI in the Key Editor. In these realtime pitch modifications the transitions are kept so that the sound remains natural. The pitch detection and correction is “non-destructive”, i.e. you can always undo modifications or revert to the original versions.

NOTE

The term “loop” is used throughout this chapter and in this context usually means an audio file with a musical time base. That means that the length of the loop represents a certain number of bars and beats at a certain tempo. Playing the loop back at the right tempo in a cycle set to the correct length will produce a continuous loop without gaps.

RELATED LINKS

Audio processing and functions on page 468
Warping audio on page 526
Working with hitpoints and slices on page 533
VariAudio on page 542

Opening the Sample Editor

To open the Sample Editor, double-click an audio event in the Project window or the Audio Part Editor, or double-click an audio clip in the Pool. You can have more than one Sample Editor window open at the same time.

NOTE

Double-clicking an audio part in the Project window opens the Audio Part Editor, even if the part contains a single audio event only.

RELATED LINKS

Audio Part Editor on page 565

The toolbar

The toolbar contains various tools for selecting, manipulating and playing back audio, as well as options that affect the appearance and behavior of the Sample Editor.

In the Musical Information section at the right of the toolbar, the estimated length of your audio file is displayed in bars and beats (PPQ) together with the estimated tempo and the time signature. These values are important for using Musical Mode.

The Algorithm pop-up menu allows you to select an algorithm for the realtime time stretching.

- You can customize the toolbar by right-clicking it and using the context menu to hide or show items.

Show Audio Event

When the “Show Audio Event” button is activated on the toolbar, the section corresponding to the edited event is highlighted in the waveform display and the Overview. The sections of the audio clip not belonging to the event are shown with a gray background.

- You can adjust the start and end of the event in the clip by dragging the event handles in the waveform display.

IMPORTANT

This button is only available if you have opened the Sample Editor by double-clicking an audio event in the Project window or the Audio Part Editor. It is not available if you have opened the audio event from the Pool.

Edit Active Audio Event Only

The “Edit Active Audio Event Only” button on the toolbar lets you restrict editing operations to the active audio event.

Snap

The Snap function helps you to find exact positions when editing in the Sample Editor by restricting horizontal movement and positioning to certain grid positions. You turn Snap on or off by clicking the Snap button in the Sample Editor toolbar.

NOTE

The Sample Editor Snap function is independent of the Snap setting in the Project window toolbar or other editors. It has no effect outside the Sample Editor.

Snap to Zero Crossing

When this option is activated, editing is done at zero crossings (positions in the audio where the amplitude is zero). This helps you to avoid pops and clicks, which might otherwise be caused by sudden amplitude changes.

NOTE

The Sample Editor function “Snap to Zero Crossing” is independent of the same setting in the Project window toolbar or other editors. It has no effect outside the Sample Editor.

Auto-Scroll

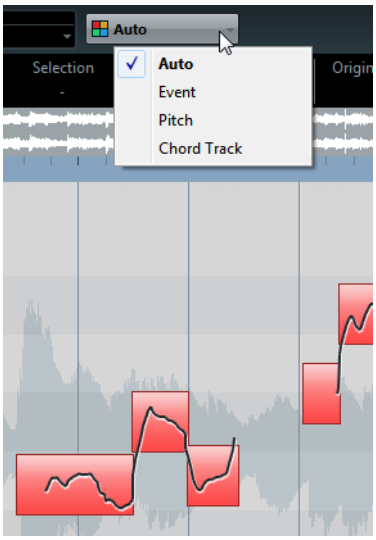
When the Auto-Scroll option is activated on the Sample Editor toolbar, the waveform display will scroll during playback, keeping the project cursor visible in the editor.

NOTE

This setting is independent of the Auto-Scroll setting in the Project window toolbar or other editors.

VariAudio Segment Colors

You can select a color scheme for VariAudio segments on the “VariAudio Segment Colors” pop-up menu on the toolbar. When working with several audio events, this makes it easier to see which segments belong to which event.



The following options are available:

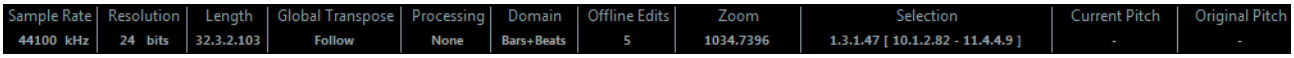
Option	Description
Auto	This is the default mode. All segments belonging to the same audio event get the same color.
Event	The segments get the same color as the corresponding event in the Project window.
Pitch	The segments get different colors depending on their pitch.
Chord Track (NEK only)	Segments that match the corresponding chord or scale events on the chord track are highlighted in a special color.

RELATED LINKS

Musical Mode on page 526
Selecting an algorithm for realtime playback on page 525
Handling Several Audio Events on page 522
Chord Functions (NEK only) on page 890
Using the Setup options on page 1226

The info line

The info line is displayed below the toolbar. It shows information about the audio clip, such as the audio format and the selection range.



Initially, length and position values are displayed in the format specified in the Project Setup dialog.

- To show or hide the info line, click the “Set up Window Layout” button on the toolbar and activate or deactivate the Info Line option.

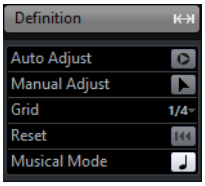
RELATED LINKS

Using the Setup options on page 1226

The Sample Editor Inspector

On the left in the Sample Editor, you will find the Sample Editor Inspector. It contains tools and functions for working in the Sample Editor.

The Definition tab



The Definition tab helps you to adjust the audio grid and define the musical context of your audio. This is useful if you have an audio loop or audio file that you want to match to the project tempo. If the Definition tab is open, a second ruler is displayed, showing the musical structure of your audio.

The AudioWarp tab

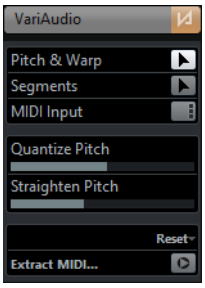
Disable Warp Changes

The AudioWarp tab lets you perform timing settings for your audio. This includes applying swing and manually changing the rhythm of the audio by dragging beats to time positions in the grid.

- If you click the “Disable Warp Changes” button, any warp modifications you have made are disabled, allowing you to compare the modified sound with the original sound of your audio.

  However, the display does not change. The time stretch applied by the Musical Mode is not disabled by this. “Disable Warp Changes” is deactivated when you reset your warp operations or when you close the Sample Editor. It will not be recalled when reopening the Sample Editor.

The VariAudio tab



Disable Pitch Changes

On this tab you can edit single notes of your audio file and change their pitch and/or timing, in a way that is similar to the editing of MIDI notes. Furthermore, you can extract MIDI from your audio.

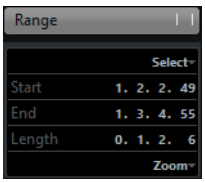
- If you click the “Disable Pitch Changes” button, any pitch modifications you have made are disabled, allowing you to compare the modified sound with the original sound of your audio.

  However, the display does not change. “Disable Pitch Changes” is deactivated when you reset your pitch or warp operations or when you close the Sample Editor. It will not be recalled when reopening the Sample Editor.

The Hitpoints tab

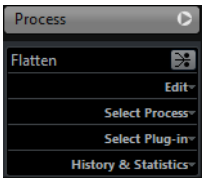
On this tab, hitpoints can be marked and edited. Hitpoints allow you to slice your audio and to create groove quantize maps from your audio. You can also create markers, regions, events, and warp markers based on hitpoints.

The Range tab



On this tab you will find functions for working with ranges and selections.

The Process tab



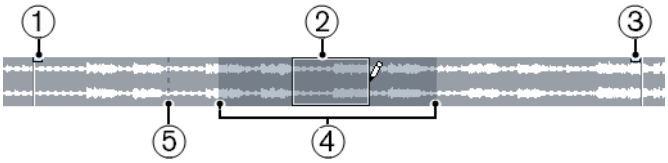
This tab regroups the most important audio editing commands from the Audio and Edit menus.

RELATED LINKS

Inspector on page 50
Warping audio on page 526
Applying swing on page 530
Free Warp on page 531
Understanding the waveform display in VariAudio on page 543
Extracting MIDI on page 559
Working with hitpoints and slices on page 533
Making selections on page 518
Audio processing and functions on page 468

The overview line

The overview line displays the whole clip.



1) Event Start
2) Selection
3) Event End
4) Viewing area
5) Snap Point

The section currently shown in the main waveform display of the Sample Editor (the viewing area) is indicated by a rectangle in the overview line, and the current selection range is also shown. If the “Show Audio Event” button is activated on the toolbar, event start/end and snap point are shown in the overview line.

- To view other sections of the clip, move the viewing area in the overview line.

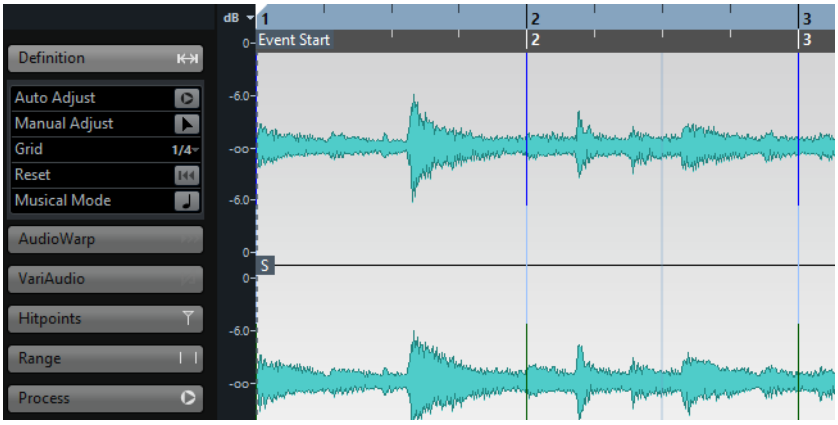
  Click in the lower half of the viewing area and drag to the left or right to move it.

- To zoom in or out, horizontally, resize the viewing area by dragging its left or right edge.

- To define a new viewing area, click in the upper half of the Overview and drag a rectangle.

The ruler

The Sample Editor ruler is located between the overview line and the waveform display.



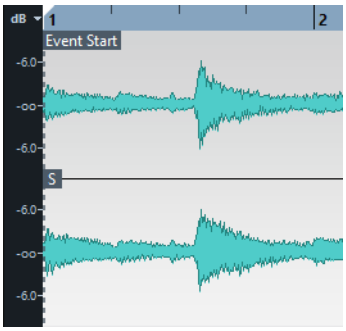
When the Definition tab is open, an additional ruler displays the musical structure of the audio file.

RELATED LINKS

Ruler on page 49

The waveform display and the level scale

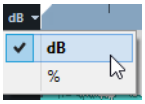
The waveform display shows the waveform image of the edited audio clip according to the wave image style set in the Preferences dialog (Event Display–Audio page).



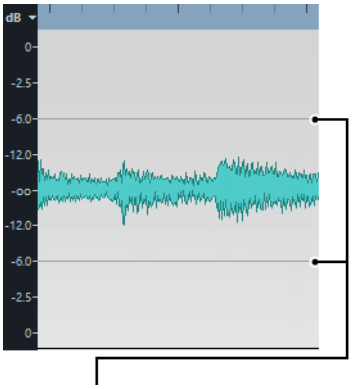
To the left of the waveform display a level scale is shown, indicating the amplitude of the audio.

- You can select whether the level is shown as a percentage or in dB.

  This is done by opening the level scale pop-up menu at the top of the level scale and selecting an option.



- Select the “Show Half Level Axis” option on the context menu of the waveform display, if you want the half level axes to be shown.



Half-level axis

RELATED LINKS

Event Display on page 1260

General Functions

Zooming

Zooming in the Sample Editor is done according to the standard zoom procedures, with the following special notes to keep in mind:

- The vertical zoom slider changes the vertical scale relative to the height of the editor window, in a way similar to the waveform zooming in the Project window.
- The vertical zoom will also be affected if the “Zoom Tool Standard Mode: Horizontal Zooming Only” preference (Editing–Tools page) is deactivated and you drag a rectangle with the Zoom tool.

The following options relevant to the Sample Editor are available on the Zoom submenu of the Edit menu or the context menu:

Zoom In

Zooms in one step, centering on the position cursor.

Zoom Out

Zooms out one step, centering on the position cursor.

Zoom Full

Zooms out so that the whole clip is visible in the editor.

Zoom to Selection

Zooms in so that the current selection fills the editor display.

Zoom to Selection (Horiz.)

Zooms in horizontally so that the current selection fills the editor display.

Zoom to Event

Zooms in so that the editor shows the section of the clip corresponding to the edited audio event. This is not available if you have opened the Sample Editor from the Pool (in which case the whole clip is opened for editing, not an event).

Zoom In/Out Vertically

This is the same as using the vertical zoom slider (see above).

Undo/Redo Zoom

These options allow you to undo/redo the last zoom operation.

- When the VariAudio tab is active, you can also zoom by holding down [Alt]/[Option] while drawing a selection rectangle around the segments that you want to zoom in on. You can zoom out by holding down [Alt]/[Option] and clicking in an empty area of the waveform.
- The current zoom setting is shown in the info line, as a “samples per screen pixel” value.

  NOTE

  You can zoom in horizontally to a scale of less than one sample per pixel! This is required for drawing with the Draw tool.

- If you have zoomed in to one sample per pixel or less, the appearance of the samples depends on the “Interpolate Audio Images” option in the Preferences dialog (Event Display–Audio page).

  If the option is deactivated, single sample values are drawn as “steps”. If the option is activated, they are interpolated to a “curve” form.

RELATED LINKS

VariAudio on page 542
Drawing in the Sample Editor on page 518
Zooming in the Project Window on page 58

Auditioning

While you can use the regular play commands to play back audio when the Sample Editor is open, it is often useful to listen to the edited material only.

NOTE

When auditioning, audio is routed to the Control Room (if activated) or to the Main Mix (the default output bus).

Clicking the Audition icon on the toolbar plays back the edited audio, according to the following rules:

- If you have made a selection, this selection will be played back.
- If there is no selection and “Show Event” is deactivated, playback will start at the cursor position.
- If the Audition Loop icon is activated, playback will continue repeatedly until you deactivate the Audition Loop icon. Otherwise, the section will be played back once.

NOTE

There is a separate Play button for auditioning regions.

Using the Speaker tool

If you click somewhere in the waveform display with the Speaker (“Play”) tool and keep the mouse button pressed, the clip is played back from the position where you click. Playback will continue until you release the mouse button.

Using Acoustic Feedback

If you activate the “Acoustic Pitch Feedback” button on the toolbar, the audio will be played back when you edit it vertically, i.e. when you change the pitch. This way you can easily audition your modifications.

Using key commands

If you activate the “Playback Toggle triggers Local Preview” option in the Preferences dialog (Transport page), you can start/stop auditioning by pressing [Space]. This is the same as clicking the Audition icon on the toolbar.

The Sample Editor also supports the “Preview start” and “Preview stop” key commands in the Media category of the Key Commands dialog. These key commands stop the current playback, whether you are in normal playback or in audition mode.

RELATED LINKS

Setting up Routing on page 384
Auditioning regions on page 524

Scrubbing

The Scrub tool allows you to locate positions in the audio by playing back, forwards, or backwards, at any speed:

PROCEDURE

1. Select the Scrub tool.

2. Click in the waveform display and keep the mouse button pressed.

   The project cursor is moved to the position where you clicked.

3. Drag to the left or right.

   The audio is played back. The speed and pitch of the playback depend on how fast you drag.

Adjusting the snap point

The snap point is a marker within an audio event. It is used as a reference position when you move events with snap activated, so that the snap point is “magnetic” to whatever snap positions you have selected.

By default, the snap point is set at the beginning of the audio event, but often it is useful to move the snap point to a “relevant” position in the event, such as a downbeat.

NOTE

- If you adjust the snap point with the Scrub tool, the audio is played back.
- You can also adjust the snap point by setting the project cursor at the desired position and selecting “Snap Point To Cursor” on the Audio menu.

  The snap point will be set to the position of the cursor. This method can also be used in the Project window and the Audio Part Editor.
- It is also possible to define a snap point for a clip (for which there is no event yet).

To open a clip in the Sample Editor, double-click it in the Pool. After having set the snap point, you can insert the clip into the project from the Pool or the Sample Editor with the set snap point position.

IMPORTANT

- When you set the grid start on the Definition tab, the snap point is moved to the grid start.
- Events and clips can have different snap points. If you open a clip from the Pool, you can edit the clip snap point. If you open a clip from within the project window, you can edit the event snap point. The clip snap point serves as a template for the event snap point. However, it is the event snap point that is taken into account when snapping.

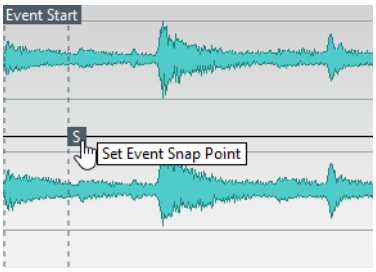
To adjust the snap point, proceed as follows:

PROCEDURE

1. Activate the “Show Audio Event” option on the toolbar, so that the event is displayed in the editor.
2. If needed, scroll until the event is visible, and locate the “S” flag in the event.

   If you have not adjusted this previously, it is located at the beginning of the event.

3. Click on the “S” flag and drag it to the desired position.



RELATED LINKS

Correcting the local definition grid on page 529

Drawing in the Sample Editor

It is possible to edit the audio clip at sample level by drawing with the Draw tool. This can be useful if you need to manually edit out a spike or click, etc.

PROCEDURE

1. Zoom in to a zoom value lower than 1.

   This means that there is more than one screen pixel per sample.

2. Select the Draw tool.

3. Click at the beginning of the section that you want to correct and draw in the new curve.

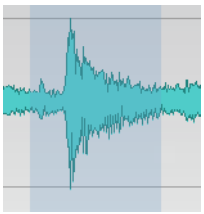
   A range selection covering the edited section is automatically applied.

   NOTE

   The Draw tool cannot be used when the VariAudio tab is open.

Making selections

To select an audio section in the Sample Editor, click and drag with the Range Selection tool.



A selected range

- If “Snap to Zero Crossing” is activated on the toolbar, the selection’s start and end are always at zero crossings.
- You can resize the selection by dragging its left and right edge or by [Shift]-clicking.

- The current selection is indicated in the corresponding fields on the Range tab of the Sample Editor Inspector.

  You can fine-tune the selection by changing these values. Note that the values are relative to the start of the clip, rather than to the project timeline.

Using the Select menu

On the Select menu on the Range tab and on the Select submenu of the Edit menu you find the following options:

All

Selects the whole clip.

None

Selects no audio (the selection length is set to “0”).

Invert (Edit menu only)

Inverts the selection.

In Loop

Selects all audio between the left and right locator.

Locators to Selection (Range tab only)

Sets the locators to encompass the current selection. This is available if you have selected one or several events or made a selection range.

Locate Selection (Range tab only)

Moves the project cursor to the beginning or end of the current selection. For this to be available, you must have selected one or more events or parts, or made a selection range.

Loop Selection (Range tab only)

This activates playback from the start of the current selection and keeps starting over again when reaching the selection end.

From Start to Cursor (Edit menu only)

Selects all audio between the clip start and the project cursor.

From Cursor to End (Edit menu only)

Selects all audio between the project cursor and the end of the clip. For this to work, the project cursor must be within the clip boundaries.

Equal Pitch - all Octaves/same Octave

This function requires that the audio event has been analyzed using the VariAudio features and that one or several notes are selected. These options select all notes of this event that have the same pitch as the currently selected note(s) (in any octave or in the current octave).

Select Controllers in Note Range (Edit menu only)

Selects the controllers within the range of the selected notes.

All on Selected Tracks (Edit menu only)

Selects all events on the selected track.

Events under cursor (Edit menu only)

Automatically selects all events on the selected track(s) that are “touched” by the project cursor.

Select Event

Selects only the audio that is included in the edited event. This is grayed out if you have opened the Sample Editor from the Pool (in which case the whole clip is opened for editing, not an event).

If the VariAudio tab is open and your audio file is split into separate segments, all segments that start or end within the event boundaries are selected.

Left Selection Side to Cursor (Edit menu only)

Moves the left side of the current selection range to the project cursor position. For this to work, the cursor must be within the clip boundaries. This function is not available for VariAudio segments.

Right Selection Side to Cursor (Edit menu only)

Moves the right side of the current selection range to the project cursor position (or the end of the clip, if the cursor is to the right of the clip). This function is not available for VariAudio segments.

NOTE

Several of these options are also available on the Sample Editor context menu.

RELATED LINKS

Segments mode on page 546

Editing selection ranges

Selections in the Sample Editor can be processed in several ways.

If you attempt to edit an event that is a shared copy (i.e. the event refers to a clip that is used by other events in the project), you are asked whether you want to create a new version of the clip.

- Select “New Version” if you want the editing to affect the selected event only. Select “Continue” if you want the editing to affect all shared copies.

  NOTE

  If you activate the “Please, don’t ask again” option in the dialog, any further editing will conform to the selected method (“Continue” or “New Version”). You can change this setting at any time with the “On Processing Shared Clips” pop-up menu in the Preferences dialog (Editing–Audio page).

- Any changes to the clip are shown in the Offline Process History, making it possible to undo them later.

Cut, Copy, and Paste

The Cut, Copy, and Paste commands (on the Edit menu, on the Process tab of the Sample Editor Inspector, or on the main Edit menu) work according to the following rules:

- Selecting Copy copies the selection to the clipboard.
- Selecting Cut removes the selection from the clip and moves it to the clipboard.
  The section to the right of the selection is moved to the left to fill the gap.
- Selecting Paste copies the data from the clipboard into the clip.
  If there is a selection in the editor, this is replaced by the pasted data. If there is no selection, the pasted data is inserted starting at the project cursor. The section to the right of the line is moved to make room for the pasted material.

Delete

Selecting Delete (on the Edit menu, on the Process tab of the Sample Editor Inspector, or on the main Edit menu) removes the selection from the clip. The section to the right of the selection is moved to the left to fill the gap.

Insert Silence

Selecting “Insert Silence” (on the Edit menu, on the Process tab of the Sample Editor Inspector, or on the Range submenu of the main Edit menu) inserts a silent section with the same length as the current selection, at the selection start.

- The selection is not replaced, but moved to the right to make room.
  If you want to replace the selection, use the “Silence” function instead.

Processing

The Processing features (on the Select Process menu, on the Process tab of the Sample Editor Inspector, or on the Process submenu of the Audio menu) can be applied to selections in the Sample Editor, as well as the effects (on the Select Plug-in menu on the Process tab of the Sample Editor Inspector or on the Plug-ins submenu of the Audio menu).

RELATED LINKS

The Offline Process History dialog on page 489
Silence on page 484
Audio processing and functions on page 468

Creating a new event from the selection using drag & drop

You can create a new event that plays only the selected range.

PROCEDURE

1. Make a selection range.
2. Drag the selection range to an audio track in the Project window.

Creating a new clip or audio file from the selection

You can extract a selection from an event and either create a new clip or a new audio file.

PROCEDURE

1. Make a selection range.
2. Open the context menu and select “Bounce Selection” from the Audio submenu.

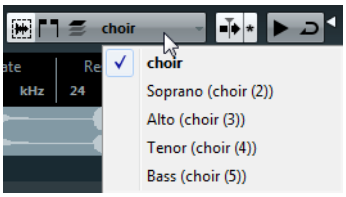
RESULT

A new clip is created and added to the Pool, and another Sample Editor window opens with the new clip. This clip refers to the same audio file as the original clip, but contains the audio corresponding to the selection range only.

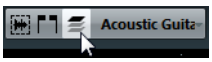
Handling Several Audio Events

When you open the Sample Editor with several events selected, the editor contains a few functions that facilitates working with multiple audio events. These functions are designed to display and edit the VariAudio segments of several audio events in context.

- The “Currently Edited Audio Event” pop-up menu on the toolbar lists all audio events that are opened in the Sample Editor. Here, you can select which audio event is active for editing.



- The “Edit Active Audio Event Only” button on the toolbar lets you restrict editing operations to the active audio event.



RELATED LINKS

VariAudio on page 542

Working with regions

Regions are sections within a clip. One of the main uses for regions is Cycle recording, in which the different “takes” are stored as regions.

You can also use this feature for marking important sections in the audio clip. Regions can be dragged into the Project window from the Sample Editor or the Pool to create new audio events.

RELATED LINKS

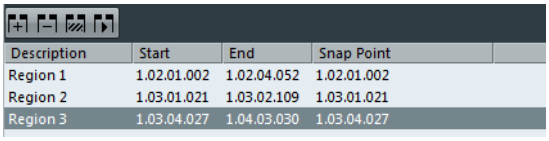
Cycle Recording on page 241

Creating and removing regions

PROCEDURE

1. Select the range that you want to convert into a region.
2. Click the “Set up Window Layout” button and activate the Regions option.

   The regions list is displayed on the right.

Description	Start	End	Snap Point
Region 1	1.02.01.002	1.02.04.052	1.02.01.002
Region 2	1.03.01.021	1.03.02.109	1.03.01.021
Region 3	1.03.04.027	1.04.03.030	1.03.04.027

3. Click the Add Region button above the regions list (or select “Event or Range as Region” from the Advanced submenu of the Audio menu).

   A region is created, corresponding to the selected range.
4. To name the region, double-click on it in the list and enter a new name.

   Using this procedure, regions can be renamed at any time.

RESULT

When you click on a region in the regions list, it is instantly displayed in the Sample Editor.

To remove a region from a clip, select it in the list and click the Remove Region button above the list.

Creating regions from hitpoints

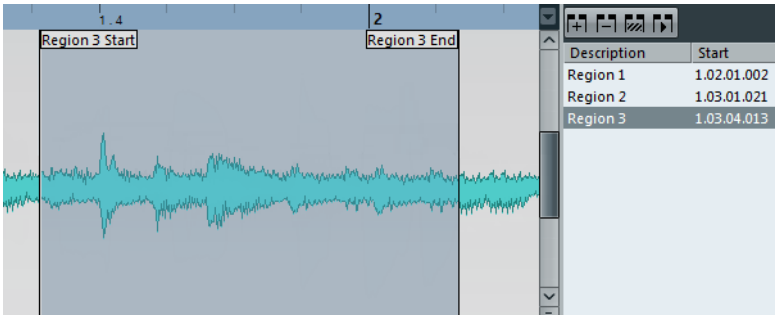
If your audio event contains calculated hitpoints, you can choose to automatically create regions from hitpoints. This can be useful to isolate recorded sounds.

RELATED LINKS

Working with hitpoints and slices on page 533

Editing regions

The region selected in the list is displayed in gray in the waveform display and the overview line.



There are two ways to edit the start and end positions of a region:

- Click and drag the region start and end handles in the waveform display (with any tool).

  When you move the pointer over the handles, it automatically changes to indicate that you can drag the handles.

- Edit the Start and End positions in the corresponding fields in the regions list.

  The positions are shown in the display format selected for the ruler and info line, but are relative to the start of the audio clip rather than the project timeline.

Auditioning regions

You can listen to a region by selecting it in the list and clicking the Play Region button above the list. The region will play back once or repeatedly, depending on whether the Loop icon on the toolbar is activated or not.

You can also listen to a region by selecting it in the list and clicking the Audition icon on the toolbar. This way you can preview separate regions by clicking on them in the list or by selecting them with the up/down arrow keys on your computer keyboard.

Making selections from regions

If you select a region in the list and click the Select Region button above, the corresponding section of the audio clip is selected (as if you had selected it with the Range Selection tool) and zoomed. This is useful if you want to apply processing to the region only.

NOTE

You can also double-click a region in the Pool to have its audio clip opened in the Sample Editor with the area of the region automatically selected.

Creating audio events from regions

You can create new audio events from regions using drag & drop.

PROCEDURE

1. In the list, click on the region and keep the mouse button pressed.
2. Drag the region to the desired position in the project and release the mouse button.

RESULT

A new event is created.

You can also use the “Events from Regions” function from the Advanced submenu of the Audio menu.

RELATED LINKS

Region Operations on page 211

Exporting regions as audio files

If you create a region in the Sample Editor, the region can be exported to disk as a new audio file. This is done from the Pool.

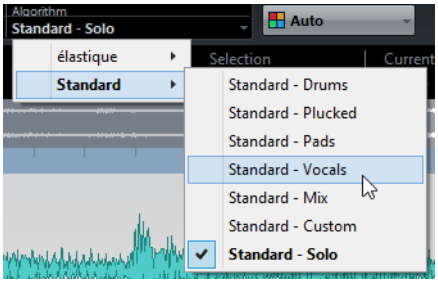
RELATED LINKS

Exporting Regions as Audio Files on page 590

Selecting an algorithm for realtime playback

On the Algorithm pop-up menu on the toolbar you can select the algorithm preset to be applied during realtime playback.

This setting affects warp changes in Musical Mode, FreeWarp, and Swing. For the VariAudio warping and pitching features, the “Standard – Solo” preset must be used and is applied automatically.



The pop-up menu contains various options that govern the audio quality of the realtime time stretching. There are presets for common uses and a Custom option that allows you to manually set warp parameters. The presets are sorted into categories, according to the technology used (élastique or Standard).

RELATED LINKS

About time stretch and pitch shift algorithms on page 502

Musical Mode

You can use the Musical Mode to tempo-match audio loops to the project tempo. Musical Mode allows you to lock audio clips to the project tempo by using realtime time stretching. This is very useful if you want to use audio in your project without worrying too much about timing.

If you want to use Musical Mode, verify that the length in bars corresponds to the audio file you imported. If necessary, listen to your audio and enter the correct length in bars and beats.

When Musical Mode is activated, audio events will adapt to any tempo changes in Nuendo, just like MIDI events.

You can activate Musical Mode ♩ on the AudioWarp tab, the Definition tab, and the toolbar.

NOTE

It is also possible to activate/deactivate Musical Mode from within the Pool by clicking the corresponding checkbox in the Musical Mode column.

IMPORTANT

Nuendo supports ACID® loops. These loops are standard audio files but with embedded tempo/length information. When ACID® files are imported into Nuendo, Musical Mode is automatically activated and the loops will adapt to the project tempo.

Warping audio

Warping is a term used to describe the realtime time stretching of a selected section of audio. Warping is generally used to correct the tempo or timing of audio.

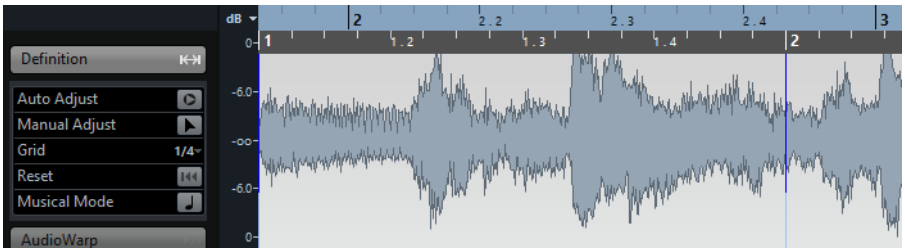
Adjusting loops to the project tempo using Musical Mode

Audio loops are normally short audio files containing a defined number of bars with straight beats. These loops can be adjusted to the project tempo by using the Musical Mode function.

PROCEDURE

1. Import an audio loop into a project and double-click it to open the Sample Editor.

   If you open the Definition tab and take a look at the rulers, you will see that the project tempo grid (upper ruler) and the grid of your audio (lower ruler) do not match.



2. From the Algorithm pop-up menu on the toolbar, select the algorithm preset to be applied during realtime playback.
3. Listen to the loop and, if necessary, correct the Bars and Beats values on the toolbar.
4. Activate the Musical Mode button.

   Your loop is warped and stretched automatically to adapt it to the project tempo.

   The rulers reflect the change.

RESULT

In the Project window, the audio event is now shown with a note symbol and a warp symbol in the upper right corner to indicate that time stretching has been applied.

RELATED LINKS

About time stretch and pitch shift algorithms on page 502

Adjusting complex audio material to the project tempo using Musical Mode

If you want to use an audio file with unknown tempo or if the beat of your audio file is not straight, you have to change the “definition” of this audio file first. This is done with the Auto Adjust function on the Definition tab of the Sample Editor Inspector.

The Auto Adjust function extracts a “local” definition grid that you can then match with the project tempo using Musical Mode.

IMPORTANT

The Auto Adjust function needs to be applied on a section containing complete bars. Therefore you first need to define a range in your audio material that starts and ends at a bar line.

To extract the definition from an audio file, proceed as follows:

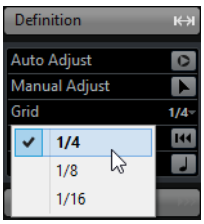
PROCEDURE

1. Open an audio clip or audio event in the Sample Editor.
2. Open the Definition tab and select a suitable value from the Grid pop-up menu.

   This determines the grid resolution for your audio.

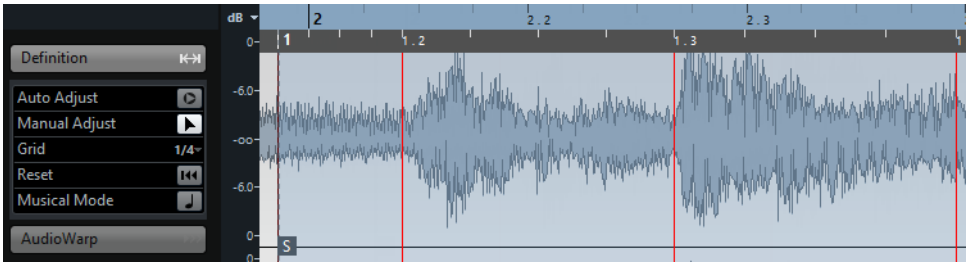
3. Select a range that is covering one or several bars.

   This selection should cover the section that you want to use in your project. The definition grid will be calculated for this section only.



4. Click the Auto Adjust button.

   The snap point is moved to the start of the selected range, which is now also the start position of the local definition grid. The lower ruler changes to reflect your edits. The transients, i.e. the bars and beats positions, are marked with vertical lines.



5. Activate the Musical Mode button.

Result

Your clip is warped and stretched automatically to adapt it to the project tempo. The rulers reflect the change.

Note

You can also apply Auto Adjust directly on an audio event or a clip. If no range selection is defined, the grid is calculated for the audio event. If no range selection and no audio event are defined, the grid is calculated for the entire clip. In both cases you need to make sure that the event or clip starts and ends on a bar line.

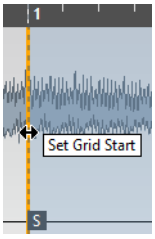
Correcting the local definition grid

In some situations, you might not be able to get satisfying results with the “Auto Adjust” function. In this case you can manually modify the grid and tempo of your audio file.

PROCEDURE

1. On the Definition tab, activate the Manual Adjust tool.
2. If the grid start does not correspond with the first main beat, move the mouse pointer to the beginning of the audio clip until the tooltip “Set Grid Start” is displayed.

   The mouse pointer turns into a double arrow.

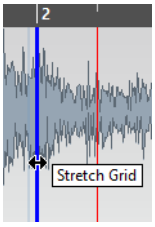
   

3. Click and drag the mouse to the right until you reach the first downbeat. Release the mouse button to move the grid start (and snap point).

   The lower ruler (for the local grid) changes to reflect your edits.
4. Audition the file to determine where the second bar in the sample begins.
5. In the upper part of the waveform, move the mouse pointer to the vertical line nearest to the second bar so that the tooltip “Stretch Grid” and a blue vertical line are shown.

   “Stretch Grid” allows you to correct the tempo by stretching or compressing the whole grid.
6. Click and drag the blue vertical line to the left or right to the position of the first downbeat in the second bar and release the mouse button.

   The beginning of the next bar is set, and all bar positions in the grid are adjusted so that the bars have the same length.

7. Check the positions of the following bars. If you find an incorrect bar position, move the mouse pointer over the grid lines in the lower part of the waveform so that the tooltip “Set Bar Position (Move Following Bars)” and a green vertical line are shown.

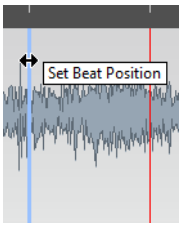
   “Set Bar Position” allows you to adjust a single bar line, thereby changing the tempo of one bar only. The bars to the right are moved accordingly, but the area to the left remains unaffected.

8. Click and drag the green vertical line to the left or right to the position of the first downbeat of the following bar and release the mouse button.

   Repeat the last two steps for all bar lines that need to be corrected.

9. Now have a look at the single beats in between the bars. If you find an incorrect beat position, move the mouse pointer over the corresponding grid line so that the tooltip “Set Beat Position” and a blue vertical line are shown.

10. Click and drag the grid line to align the single beat position with the waveform, and release the mouse button.



11. To remove a misplaced beat edit, press any modifier key so that the Erase tool is shown and click on the adjusted grid line.

NOTE

If you want to hear your changes immediately, you can activate Musical Mode for this procedure. The warping will be recalculated after each edit.

Applying swing

If you find that your audio sounds too straight, for example, after having used the “Auto Adjust” function, you can add swing.

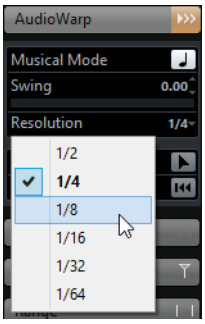
PROCEDURE

1. Activate Musical Mode.

2. On the Algorithm pop-up menu on the toolbar, select the algorithm preset that fits the audio material best.

3. On the AudioWarp tab, select a suitable grid resolution from the Resolution pop-up menu.

   This defines the positions that the swing is applied to. For example, if you select 1/2, the swing is applied in steps of half notes.



4. Move the Swing fader to the right to offset every second position in the grid.

RESULT

This creates a swing or shuffle feel.

Depending on how far you move the fader to the right and what grid resolution you chose, this function offers everything from half-note swing to 64th-note swing.

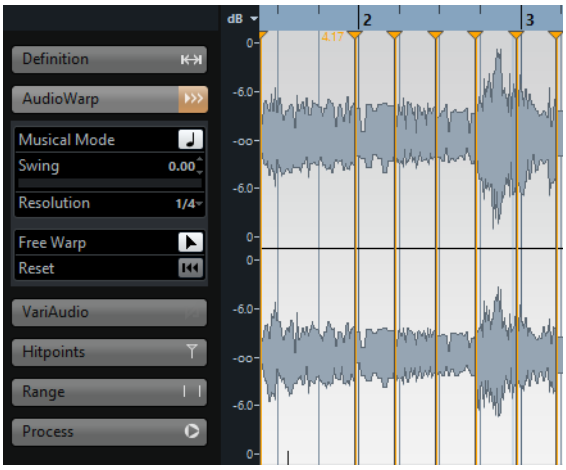
RELATED LINKS

About time stretch and pitch shift algorithms on page 502

Free Warp

The Free Warp tool allows you to change the timing of individual positions in the audio material. The Free Warp tool snaps to hitpoint positions and/or warp markers.

The Free Warp tool creates warp markers. Warp markers are a kind of marker or anchor that can be attached to musically relevant time positions in an audio event, for example, the first beat of every bar. Warp markers can be dragged to the corresponding time positions in the project, and the audio will be stretched accordingly.



A typical application of warp tabs is to use them to synchronize audio to video. You can also use warp tabs for further tweaking after having activated Musical Mode.

IMPORTANT

When you activate or deactivate Musical Mode or select another Resolution value, all your warp modifications are lost.

NOTE

Warp markers can also be created from hitpoints.

RELATED LINKS

Audio editing to picture on page 1144
Create Warp Markers on page 541

Correcting the Timing

You can correct the timing using the Free Warp tool.

PROCEDURE

1. Open the audio file that you want to process in the Sample Editor.
2. Activate the “Snap to Zero Crossing” button on the Sample Editor toolbar.

   When this button is activated, warp markers will snap to zero crossings.
3. If you want to use the Free Warp tool for selective timing corrections, you can define the local definition grid and activate Musical Mode.

   The next step is to find out where a warp marker needs to be added.
4. On the Transport panel, activate the Click button, and play back your audio clip to determine positions where the beat is not on time with the click.

   If you find it difficult to pinpoint an exact position in the audio event, you can use the Scrub tool and/or zoom in the view.
5. On the AudioWarp tab, select the Free Warp tool, place the pointer at the position of the beat that you want to adjust, click, and hold.

   The mouse pointer changes to a clock with arrows on either side and a vertical line in the middle. A new warp marker is inserted.
6. With the mouse button still pressed, drag the warp marker to the new position and release the mouse button.

   The beat should now be perfectly aligned with the corresponding position in the project. You can also first add warp markers at the relevant musical positions and change their positions later.

RESULT

Next to the warp marker handle in the ruler, a number is shown. This number indicates the warp factor, that is the amount of stretch. Warp factors higher than 1.0 indicate that the audio region preceding the warp marker is expanded and will play back slower. Warp factors lower than 1.0 indicate that the audio region preceding the warp marker is compressed and will play back faster.

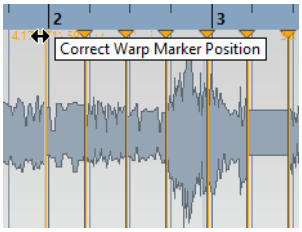
RELATED LINKS

Editing warp markers on page 533

Editing warp markers

- To stretch or compress the audio using a warp marker, select the Free Warp tool and position the pointer on the warp line in the waveform, click and drag.
- To change the position of a warp marker in the audio, click and drag the warp marker handle in the ruler.

  This will change the warping.



- To disable all warp modifications, click the “Disable Warp Changes” button on the AudioWarp tab.
- To delete a warp marker, hold down [Alt]/[Option] so that the pointer becomes an eraser, and click on the warp marker. To delete several warp markers, hold down [Alt]/[Option] while drawing a selection rectangle.

Resetting warp modifications

You can reset your Free Warp edits.

PROCEDURE

- Click **Reset** on the AudioWarp tab.

  This also resets **Disable Warp Changes** on the same tab.

  NOTE

  If Musical Mode is activated, only Free Warp edits are reset.

Working with hitpoints and slices

Nuendo can detect hitpoints, musically relevant positions, by analyzing onsets and melodic changes. At these positions a type of marker is added. Hitpoints allow you to create slices, where each slice ideally represents each individual sound or “beat”. Drum or other rhythmic recordings or loops work best with this feature.

Purpose and preparation

Hitpoints are useful to slice up audio to make it fit the project tempo or to create a situation that allows the song tempo to be changed while retaining the timing of a rhythmic audio loop.

When you have successfully detected the hitpoints for an audio file, you can do a number of useful things:

- Change the tempo of the audio material without affecting the pitch and audio quality.
- Extract the timing (a groove map) from a drum loop. The groove map can then be used to quantize other events.
- Use slices to replace individual sounds in a drum loop.
- Extract sounds from loops.

You can further edit these slices in the Audio Part Editor. You can, for example:

- Remove or mute slices.
- Change the loop by reordering, replacing, or quantizing slices.
- Apply processing or effects to individual slices.
- Create new files from individual slices using the “Bounce Selection” function on the Audio menu.
- Transpose in realtime and stretch slices.
- Edit slice envelopes.

Hitpoints can also be used to quantize audio material without creating slices.

RELATED LINKS

Creating Groove Quantize Presets on page 272
Quantizing MIDI and Audio on page 261

Which audio files can be used?

Here are some guidelines as to what type of audio files are suited for slicing using hitpoints:

- Each individual sound should have a noticeable attack.

  Slow attacks, legato playing, etc. may not produce the expected result.

- Poorly recorded audio might be difficult to slice correctly.

  In these cases, try to normalize the files or to remove DC Offset.

- The recorded audio should contain as little crosstalk signals as possible.

  Crosstalk refers to the “bleeding” of a sound into a microphone placed before another instrument during recording.

- There may be problems with sounds drowned in smearing effects, like short delays.

Adjusting the tempo: warping vs. hitpoints and slices

Both the warping features and the hitpoint detection can be used to alter the tempo and timing of audio material.

Warping is very useful for continuous audio material without noticeable gaps between the individual sounds, for example, piano or vocal recordings.

Using hitpoints has the advantage that the quality of the sound is not affected and no artifacts are being introduced. The audio is cut up into slices that are then moved on the timeline, making this method especially suited for drums, which contain silence between the individual sounds. Furthermore, hitpoint detection is useful for multi-track drum recordings, because the phase alignment is kept stable. Using hitpoints and slices for continuous audio material is not recommended, as it is difficult to fill the gaps caused by moving the slices.

Automatic Hitpoint Detection

When you add an audio file to your project by recording or by importing, Nuendo can automatically detect hitpoints. This allows you to navigate to hitpoints of an audio file from within the **Project** window.

For long audio files, hitpoint detection may take a while. All operations that are based on hitpoints are disabled during the calculation.

- To enable automatic hitpoint detection, select **File > Preferences > Editing > Audio** and activate **Enable Automatic Hitpoint Detection**.
- In the **Project** window, hitpoints are shown for the selected event, provided that the zoom factor is high enough.

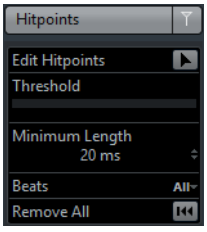
  To hide them, select **File > Preferences > Event Display > Audio** and disable **Show Hitpoints on Selected Events**.

RELATED LINKS

Enable Automatic Hitpoint Detection on page 1253

Filtering hitpoints

You can filter hitpoints in the **Hitpoints** Inspector tab of the **Sample Editor**.



You can use the following parameters to filter hitpoints:

Threshold

This filters hitpoints by their peaks. This allows you to discard hitpoints of quieter crosstalk signals, for example.

Minimum Length

This filters hitpoints by the distance between two hitpoints. This allows you to avoid creating slices that are too short.

Beats

This allows you to filter hitpoints by their musical position. This allows you to discard hitpoints that do not fit within a certain range of a defined beat value.

Using Hitpoints to Locate Audio Positions in the Project Window

You can navigate through the hitpoints of an audio event in the **Project** window.

PREREQUISITE

Enable Automatic Hitpoint Detection is activated (**File > Preferences > Editing > Audio**).

PROCEDURE

1. Select the audio track that contains the audio event for which you want to locate hitpoints.
2. Press [Alt]/[Option]-[N] to navigate to the next hitpoint, or [Alt]/[Option]-[B] to navigate to the previous hitpoint.

RESULT

The project cursor jumps to the respective hitpoint.

Auditioning and hitpoints

- You can audition the hitpoint slices, that is the area between two hitpoints, by pointing and clicking in any slice area.

  The pointer changes to a speaker icon and the corresponding slice is played back from the beginning to the end.

Navigating between hitpoints

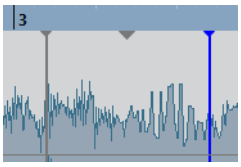
- You can navigate between the slices using the arrow keys or by pressing the [Tab] key.
- You can select the next or previous hitpoint marker using the “Locate Next/Previous Hitpoint” commands.

The default key commands for this are [Alt]/[Option]-[N] and [Alt]/[Option]-[B].

Editing hitpoints

You can change the state of a hitpoint, insert new hitpoints manually, and move existing hitpoints.

Hitpoints can have three different states: enabled, locked, and disabled. “Enabled” is the normal state a hitpoint has immediately after the detection. Hitpoints can be “disabled” so that they are still visible as gray triangles on the timeline, but will not be taken into account for further operations. “Locking” hitpoints is an easy way to make sure that hitpoints are not accidentally filtered out. Locked hitpoints are not affected by the Threshold slider and Beats pop-up menu.



An enabled, a disabled, and a locked hitpoint

Disabling and locking hitpoints

After applying the different hitpoint filters, you may find that you want to keep individual hitpoints that were filtered out or disable hitpoints that you do not need. Furthermore, you may want to lock certain hitpoints.

- To lock a hitpoint, move the mouse pointer over the gray triangle on the timeline so that the tooltip “Lock Hitpoint” is shown. Click on the triangle.

  This way, enabled and disabled hitpoints can be locked.

- To lock a disabled hitpoint, you can also press [Alt]/[Option] and move the mouse over the waveform. At positions where a disabled hitpoint can be locked, a gray hitpoint line and the tooltip “Lock Hitpoint” are shown. Click to lock the hitpoint.

- To lock multiple hitpoints, press [Shift]-[Alt]/[Option] so that the tooltip “Lock multiple hitpoints” is shown and drag a rectangle over the hitpoints.

  All enabled and disabled hitpoints within the area defined by the rectangle become locked.

- To disable hitpoints, press [Shift] so that the tooltip “Disable Hitpoints” is shown and click on the line of a single hitpoint or drag a rectangle over all the hitpoints that you want to disable.

  This way, enabled and locked hitpoints can be disabled.

- To disable a locked hitpoint, you can also point the mouse at the blue hitpoint triangle on the timeline so that the tooltip “Disable Hitpoint” is shown. Click on the triangle.

Resetting hitpoints

Sometimes it can be useful to reset hitpoints to their original state, e.g. because you still want them to be affected by the Threshold slider.

PROCEDURE

- To reset hitpoints to their original state, press [Ctrl]/[Command]-[Alt]/[Option] so that the tooltip “Enable/Unlock Hitpoints” is shown and drag a rectangle over the hitpoints.

RESULT

All disabled and locked hitpoints within the area defined by the rectangle are reset. Note that some of the hitpoints may still appear as disabled due to the Threshold slider and Beats pop-up menu settings.

Inserting hitpoints

If you get too few hitpoints using the filter options, you can insert hitpoints manually.

PROCEDURE

- To insert a new hitpoint, press [Alt]/[Option] and click at the position where you want to enter the new hitpoint (i.e. at the start of the sound).

  Manually added hitpoints are locked by default.

Moving hitpoints

If a hitpoint was either placed too far away from the start of the sound or too far into the sound, you can move it.

PROCEDURE

- To move a hitpoint, press [Alt]/[Option] and point the mouse at the vertical line of the hitpoint.

RESULT

The mouse pointer changes to a double arrow and the tooltip “Move Hitpoint” is shown. You can now drag the hitpoint to its new position.

NOTE

Moved hitpoints are locked by default.

Slicing audio

Once you have set up the hitpoints as needed, you can slice the audio by clicking the Create Slices button on the Hitpoints tab. Alternatively, you can select the "Create Audio Slices from Hitpoints" command from the Hitpoints submenu of the Audio menu.

The following happens:

- The Sample Editor closes.
- The audio event is "sliced" so that the sections between the hitpoints become separate events, all referring to the same original file.
- The audio event is replaced by an audio part, containing the slices (double-click the part to view the slices in the Audio Part Editor).

IMPORTANT

When you create slices, all events referring to the edited clip are also replaced.

- The audio is automatically adapted to the project tempo, taking the specified tempo or bars and beats values into account: if the event was one bar long, the part is resized to fit exactly one bar in the Nuendo tempo, and the slices are moved accordingly, keeping their relative positions within the part.
- In the Pool, the sliced clip is shown with a different icon. Dragging the sliced clip from the Pool to an audio track creates an audio part with the slices adapted to the project tempo, just as above.

The audio should now play back seamlessly at the tempo set in the project!

Slices and the project tempo

The musical time base setting and the project tempo affect how the sliced audio is played back.

Make sure that the "Toggle Time Base" button in the track list or Inspector is set to a musical time base (the button shows a note symbol). This way the loop will follow any further tempo changes.

If the project tempo is slower than the tempo of the original audio event, there may be audible gaps between the slice events in the part. To remedy this, you can apply the "Close Gaps (Timestretch)" function from the Advanced submenu of the Audio menu on the parts containing the slice events. Time stretch is applied to each slice to close the gaps. Depending on the length of the part and the algorithm set in the Preferences dialog (Editing–Audio page), this can take a while.

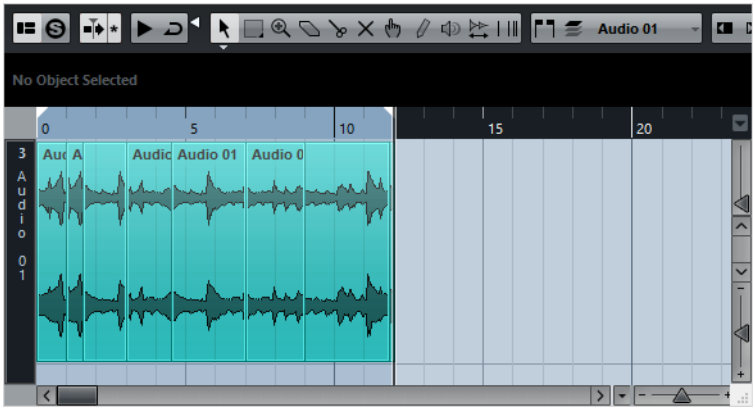
NOTE

If you open the Pool, you will see that new clips were created, one for each slice.

If you decide to change the tempo again after using the "Close Gaps (Timestretch)" function, undo the Close Gaps operation or start over again, using the original, unstretched file.

Also consider activating auto fades for the corresponding audio track – fade-outs set to about 10 ms will help eliminate any clicks between the slices when you play back the part.

If the project tempo is higher than the tempo of the original audio event, the slice events are overlapping. Activate auto crossfades for the track to smooth out the sound. Furthermore, you can select the overlapping events inside the part and apply the “Delete Overlaps” function from the Advanced submenu of the Audio menu.



The slices in the Audio Part Editor. Here, the project tempo was higher than the clip’s original tempo – the slice events overlap.

RELATED LINKS

Defining the Track Time Base on page 156
Making global Auto Fade settings on page 287
Making Auto Fade settings for individual tracks on page 288

Slicing multi-track drum recordings

If you have a multi-track drum recording that you want to quantize using hitpoints, you can put all the tracks belonging to the recording in an edit group, calculate the hitpoints for the relevant tracks (e.g. Kick, Snare, and Hi-hats), and use the “Divide Audio Events at Hitpoints” command on the Audio menu (Hitpoints submenu) to slice all tracks of the recording at once.

RELATED LINKS

Quantizing Multiple Audio Tracks on page 263

Other hitpoint functions

On the Hitpoints tab of the Sample Editor Inspector, you will also find the following functions. Many of these functions are also available on the Hitpoints submenu of the Audio menu. If selected on the Audio menu, they can be applied on several events and even range selections at the same time.

Create Groove

You can generate a groove quantize map based on hitpoints that you have created.

RELATED LINKS

Creating Groove Quantize Presets on page 272

Create Markers

If an audio event contains calculated hitpoints, you can click the Create Markers button on the Hitpoints tab to add a marker for each hitpoint on the active marker track. If your project has no marker track, it will be added and activated automatically. Markers can be useful to snap to hitpoints, e.g. for locating hitpoints and for using the Time Warp tool.

RELATED LINKS

Markers on page 312
The Time Warp tool on page 989

Create Regions

If your audio event contains calculated hitpoints, you can click the Create Regions button on the Hitpoints tab to automatically create regions from hitpoints. This can be useful to isolate recorded sounds.

Create Events

If your audio event contains calculated hitpoints, you can click the Create Events button on the Hitpoints tab to automatically create separate events based on the hitpoints.

Create Warp Markers

If you want to quantize audio based on hitpoints, you can use this option to create warp markers from the calculated hitpoints. This option is identical with using the “Create Warp Markers from Hitpoints” option on the Realtime Processing submenu of the Audio menu.

Create MIDI Notes

You can export your hitpoints to a MIDI part containing a MIDI note for each hitpoint. For example, you can use this function to double, replace, or enrich drum hits by triggering sounds of a VST instrument at the positions of the hitpoints.

To convert the hitpoints into MIDI notes, click the “Create MIDI Notes” button. Make the desired settings in the Convert Hitpoints to MIDI Notes dialog and click OK.

The following options are available:

Velocity Mode/Velocity

- Dynamic Velocity Value – The velocity values of the created MIDI notes vary, according to the peak levels of the corresponding hitpoints.
- Fixed Velocity Value – The created MIDI notes get the same velocity value. You can set this value using the Velocity field.

Pitch/Length

- Hitpoints do not contain any information about pitch or duration. Therefore, all created MIDI notes get the same pitch and note length. Use these fields to specify the desired values.

Destination

- First Selected Track – The MIDI part is placed on the first selected MIDI or instrument track. Note that any MIDI parts from previous conversions that are on this track will be deleted.
- New MIDI Track – A new MIDI track is created for the MIDI part.
- Project Clipboard – The MIDI part is copied into the clipboard so that you can insert it at the desired position on a MIDI or instrument track.

VariAudio

With the AudioWarp features, editing audio in the time domain has become significantly easier. However, editing pitch was limited to having just one single numeric “transpose” value per event or part.

VariAudio offers completely integrated vocal editing and pitch alteration of individual notes in monophonic vocal recordings and can solve intonation and timing problems with only a few mouse clicks. It was developed and optimized specifically to be used with monophonic vocal recordings. Though the detection and stretching of notes of other monophonic audio recordings, such as those of a saxophone, may work well, the quality of the end result depends greatly on the generic condition and structure of the recording’s texture.

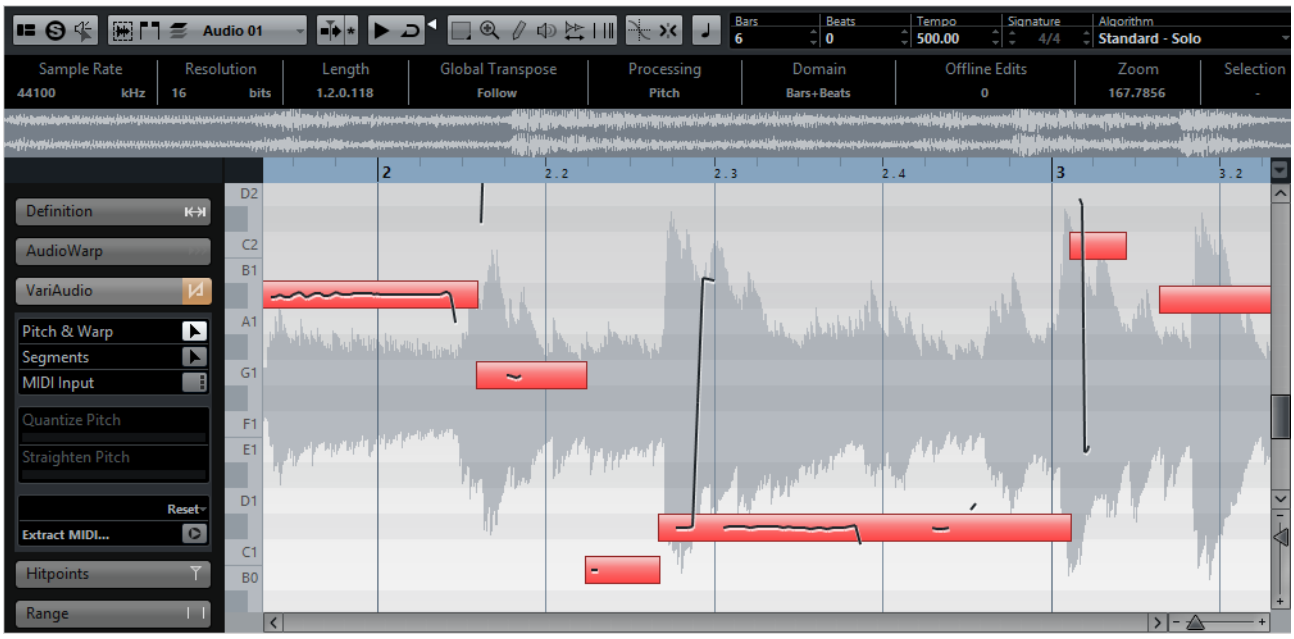
And how does it work? First, the vocal line is analyzed and split into segments shown as graphic representation of the notes sung. After the detection process is complete, the recognized notes can be modified entirely “non-destructively” so that any modifications to the audio material can be undone.

VariAudio allows you to change your audio on the vertical axis and on the horizontal axis.

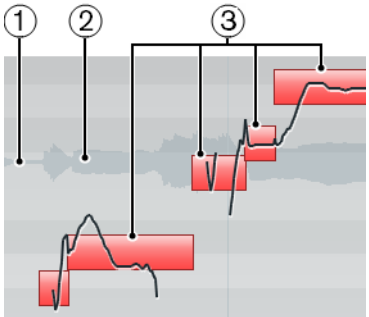
RELATED LINKS
Changing the pitch on page 550
Warping segments on page 555

Understanding the waveform display in VariAudio

When you open monophonic vocal recordings in the Sample Editor and activate the Segments or the Pitch & Warp tool on the VariAudio tab, your audio is analyzed and segmented to display the tonal portions, i.e. the notes sung or played. This process is called segmentation. The segmentation allows you to easily associate the audio with your lyrics and to introduce pitch and timing changes.



In between the different segments you may find gaps where non-tonal portions have been detected, e.g. caused by breath sounds.



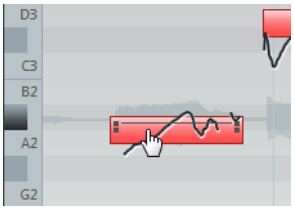
At the beginning of the waveform, you can see a gap where no segment is shown.

1) Gap
2) Audio waveform
3) Segments

NOTE

The audio waveform displayed on the VariAudio tab is always shown as mono, even if you have opened a stereo or multi-channel file.

The piano keyboard to the left of the waveform indicates the pitch positions. By moving a segment vertically, you can change its average pitch.

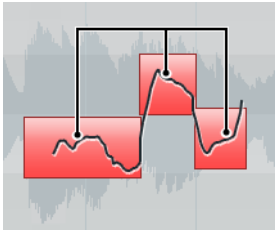


Note pitches represent the perceived fundamental frequency of a sound. The note A4 is perceived to be of the same pitch as a sine wave of 440 Hz. The notation of pitches is a logarithmic frequency scale. The table below shows the relation between pitch (note name) and frequency in Hz:

C4	C#4/Db4	D4	D#4/Eb4	E4	F4	F#4/Gb4
261.63	277.18	293.66	311.13	329.63	349.23	369.99

G4	G#4/Ab4	A4	A#4/Bb4	B4	C5
392.00	415.30	440.00	466.16	493.88	523.25

The average pitch of a segment is calculated from its micro-pitch curve. Micro-pitch curves represent the progression of the pitch for the tonal portion of the audio.



Micro-pitch curves

The horizontal position of a segment indicates the time position and the length.

You can navigate through the segments by using the left/right arrow keys on your computer keyboard.

You can zoom in on the segments that you want to edit by holding down [Alt]/[Option] while drawing a selection rectangle. To zoom out, hold down [Alt]/[Option] and click in an empty area of the waveform. If you hold down [Alt]/[Option] and double click in an empty area, the display will be zoomed out to show all segments.

Applying editing, offline processes, and VariAudio

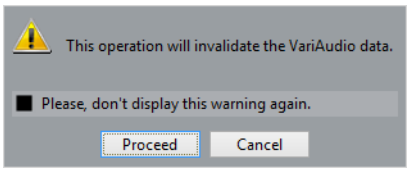
The following offline processes and edits that affect the length of the audio file may lead to the reanalysis of the audio material:

- Options on the Select Process menu, on the Process tab of the Sample Editor Inspector, or in the Process submenu of the Audio menu that can be applied to selections.
- Effect processing using the options on the Select Plug-in menu on the Process tab of the Sample Editor Inspector or in the Plug-ins submenu of the Audio menu.
- Cut, paste, and delete, or drawing notes.

IMPORTANT

Because of the reanalysis any existing VariAudio data becomes invalid. Therefore, you should always apply offline processing or edits before using the VariAudio features.

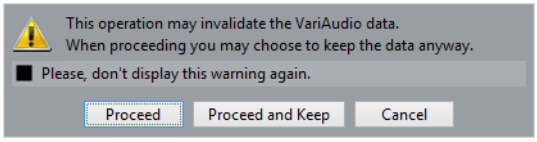
If you apply editing that affects the audio itself (like cutting portions, etc.) to a file containing VariAudio data, the following warning message is displayed:



- If you click “Proceed”, your edits are applied and you will lose your VariAudio data.

  Click “Cancel” to return to your audio file without applying any changes.

If you apply offline processing to a file containing VariAudio data, the following warning message is displayed:



- If you click “Proceed”, your edits are applied, and you will lose your VariAudio data.

  Click “Cancel” to return to your audio file without applying any changes.

- If you click “Proceed and Keep”, your edits are applied. Any VariAudio data in the audio file is kept.

  Offline processes that may not affect existing VariAudio data are Envelope, Fade In/Out, Normalize, or Silence.

- If you activate the “Please don’t display this warning again” option in one of these warning dialogs before proceeding, Nuendo will always proceed with the selected option.

  You can reactivate the warning messages by deactivating the “Inhibit warning when changing the Sample Data” or “Inhibit warning when applying Offline Processes” options in the Preferences dialog (VariAudio page).

RELATED LINKS

Audio processing and functions on page 468
Editing selection ranges on page 520
Drawing in the Sample Editor on page 518

Segments mode

If you activate Segments mode on the VariAudio tab, your audio file is analyzed and split into separate segments.

IMPORTANT

Due to the data gained during this process, the audio and thus the size of your project can increase. Furthermore, the analysis of long audio files might take some time.

When you want to change the pitch of audio that includes non-tonal portions, e.g. consonants or effect sounds like reverberation, you may have to edit the segmentation in order to include the non-tonal portions in the segments. Otherwise, pitch modifications will only affect the tonal portions.

Editing the segmentation includes changing the start and end position of a segment, cutting or gluing segments, and moving or deleting them. Just select the section of the file that you want to change, activate Segments mode, and edit the segmentation for the desired section. If you are not satisfied with your changes, you can go back to the original segmentation.

IMPORTANT

Editing the segmentation always leads to a recalculation of the segment's pitch. Therefore, it is recommended that you edit the segmentation before changing the pitch.

NOTE

In Segments mode, the segments are shown with a hatched background. You can switch between "Pitch & Warp" and "Segments" mode by pressing the [Tab] key.

The following paragraphs list the corrections that can be performed when Segments mode is activated.

RELATED LINKS

Reset on page 558
Pitch & Warp tool on page 550

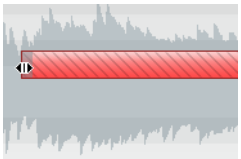
Changing the note start or end point

If you find that a note starts or ends too early or too late, e.g. when the reverb of a note or a consonant is not included in the segment, proceed as follows:

PROCEDURE

1. On the VariAudio tab activate Segments mode.
2. To change the length of a segment, move the mouse pointer over the start/end of the segment.

   The mouse pointer becomes a double arrow.

3. Click and drag the segment start/end to the left or right.

RESULT

The segment length changes accordingly. As the average pitch is recalculated, the segment may jump upwards or downwards. Snap will not be taken into account.

IMPORTANT

If the resulting segment pitch cannot be calculated because of an increase in non-tonal data, the segment will be deleted.

NOTE

You can drag the segment start/end only until it reaches the start/end of the next segment. Segments cannot overlap each other.

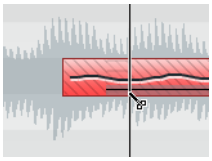
Cutting a segment

If you notice that a segment includes more than one note, proceed as follows:

PROCEDURE

1. On the VariAudio tab activate Segments mode.
2. Move the mouse pointer over the lower border of the segment that you would like to cut.

   The mouse pointer becomes a scissor.

3. Click at the desired position to cut the segment.

RESULT

The segment is cut accordingly taking Snap into account.

IMPORTANT

When the resulting segment pitch cannot be calculated because of an increase in non-tonal data, the segment will be deleted.

NOTE

There is a minimum size for a segment. Very short segments cannot be cut.

Gluing segments

IMPORTANT

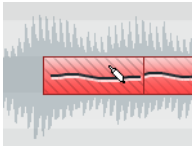
We recommend to correct the segmentation before pitching. If you glue together segments after changing the pitch (this includes manual pitch modifications, Quantize Pitch, and Straighten Pitch), your modifications are reset and the original pitch will be heard.

If you notice that a single note is spread over two segments, proceed as follows:

PROCEDURE

1. On the VariAudio tab activate Segments mode.
2. Hold down [Alt]/[Option] and move the mouse pointer over the segment that you want to glue to the next.

   The mouse pointer becomes a glue tube.

3. Click to glue the active segment to the next segment.

RESULT

If several segments are selected, they are all glued together. Snap is not taken into account.

IMPORTANT

If the resulting segment pitch cannot be calculated because of an increase in non-tonal data, the segment will be deleted.

Moving segments horizontally

After cutting a segment it may be necessary to move segments horizontally, for example, if you notice that a note is at the wrong position.

PROCEDURE

1. On the VariAudio tab activate Segments mode.
2. Move the mouse pointer over the upper border of the segment.
   The mouse pointer becomes a double arrow.

3. Click and drag the whole segment to the left or right.

RESULT

The segment is moved accordingly. If several segments are selected, they are all moved together. Snap is not taken into account.

IMPORTANT

If the resulting segment pitch cannot be calculated because of an increase in non-tonal data, the segment will be deleted.

NOTE

You can only drag the segment start/end until it reaches the start/end of the next segment. Segments cannot overlap each other.

Deleting segments

Sometimes it might be useful to delete segments. This is the case in situations where you want the original audio to be played back, e.g. for non-tonal portions or consonants.

PROCEDURE

- You can delete segments by selecting them in Segments mode and pressing [Backspace].

Saving the segmentation

The corrected segmentation is saved with the project, no additional saving is required.

Pitch & Warp tool

If you activate the Pitch & Warp tool on the VariAudio tab, you can change the pitch and the timing of your audio.

IMPORTANT

Before changing the pitch or timing of your segments, make sure that the segments you want to change are correct.

You can edit the pitch and timing of audio segments for corrective purposes but also creatively. VariAudio allows you to experiment freely with note pitches in order to change the melody with or without preserving a natural sound. Furthermore, you can change the timing of the audio.

NOTE

- In Pitch & Warp mode, the segments are shown with a plain background. You can switch between “Pitch & Warp” and “Segments” mode by pressing the [Tab] key.
- There are some restrictions concerning the highest and lowest possible note pitch. You cannot choose note pitches above C5 and below E0.

RELATED LINKS

Segments mode on page 546

Changing the pitch

You can edit the pitch of a segment.

PROCEDURE

1. On the VariAudio tab activate the Pitch & Warp tool.
2. Move the mouse pointer over the segment.

   The mouse pointer becomes a hand symbol to indicate that you can change the pitch of the segment. If the zoom factor is high enough, a tooltip indicates the found note pitch and the segment’s deviation from this pitch in percent.

There are three different modes that affect the way in which a note will snap to a certain pitch that can be accessed using the following modifier keys:

Option	Description	Default modifier
Absolute Pitch Snapping	Pitches the segment to the next semitone.	[Ctrl]/[Command]
Relative Pitch Snapping	Snaps the segment in relation to its current deviation in cents, i.e. if the segment has a pitch of C3 and a deviation of 22%, and you move it up by one semitone, it will be pitched to C#3 while keeping the deviation of 22%.	None
No Pitch Snapping	Lets you edit the pitch freely.	[Shift]

NOTE

The default modifier key can be changed in the Preferences dialog (Editing–Tool Modifier page).

3. Drag the segment up or down to the desired pitch and release the mouse.

   However, be careful: The more the pitch deviates from the original pitch, the less likely it is that your audio sounds natural.

RESULT

If the Solo algorithm preset is not turned on already, a warning appears informing you that Nuendo has selected it automatically. The segment is pitched accordingly. While dragging, the original micro-pitch curve of the segment is shown in orange. If several segments are selected, they are all pitched.

You can also use the up/down arrow keys on your computer keyboard to edit the note pitches.

Proceed as follows:

- Use the up/down arrow keys to change the pitch in semitone steps.
- Hold down [Shift] while using the up/down arrow keys to change the pitch in cent steps.

IMPORTANT

If you pitch-shift audio events with the Transpose options, the transposition is added to the pitch modifications that you introduced with the Pitch & Warp tool, even if this is not reflected in the segmentation display.

RELATED LINKS

Transpose Functions on page 301

Quantize Pitch

You can also quantize the audio pitch upwards or downwards to iteratively reduce the deviation from the nearest semitone position.

PROCEDURE

1. Select the segments that you want to quantize.
2. Move the Quantize Pitch slider to the right.

RESULT

The selected segments are quantized iteratively.

NOTE

You can set up a key command for Quantize Pitch in the Sample Editor category of the Key Commands dialog. When using the key command, the segments are directly quantized to the next semitone position.

RELATED LINKS

Key Commands on page 1168

Tilting the micro-pitch curve

Sometimes changing the pitch of the whole note segment is not enough. In these cases you will have to modify how the pitch changes inside the segment. This is indicated by the micro-pitch curve.

Changing the Micro-Pitch Curve

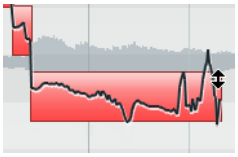
IMPORTANT

The micro-pitch curve displays the progression of the pitch for the tonal portion of the segment. For non-tonal portions of the audio, micro-pitch curves cannot be shown.

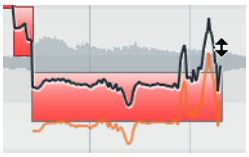
PROCEDURE

1. On the VariAudio tab, activate the Pitch & Warp tool.
2. To change the micro-pitch of a segment, move the mouse pointer over the top left/right corner of the segment.

   The mouse pointer becomes an up/down arrow.
3. Drag upwards/downwards with the mouse to change the micro-pitch curve.



If the pitch falls at the end of the segment…



…activate the Pitch & Warp tool, point at the top right corner and drag upwards.

Changing the Pitch-Curve for Segment Start or End

If you want to change the pitch modulation only for the segment start or end, you can set an “anchor point” to specify which part of the segment is affected.

PROCEDURE

1. Move the mouse pointer over the top border of the segment.

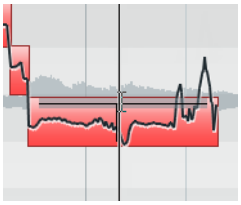
   The mouse pointer becomes an I-beam symbol.

2. Click at the position where you want to set an anchor.

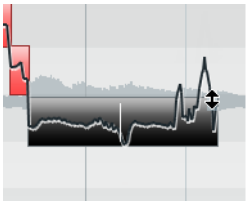
   A vertical line appears at the position where you clicked. A segment can only have one anchor.

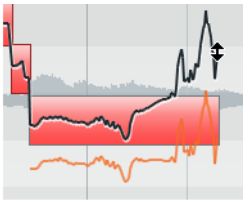
3. Move the mouse pointer over the top left/right corner of the segment and drag upwards or downwards to tilt the micro-pitch curve.

   The modulation curve is only changed from the segment border to the anchor.



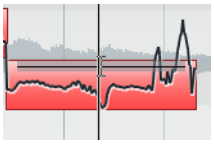
Move the mouse over the top border and click to set an anchor…



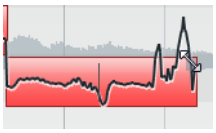


…if you only want to compensate for the descending pitch at the end of the segment.

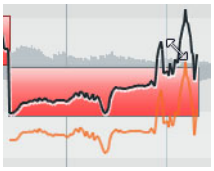
If you press [Alt]/[Option] while dragging up/down, the tilt anchor is used as an axis around which the micro-pitch curve can be rotated.



If you set a tilt anchor…



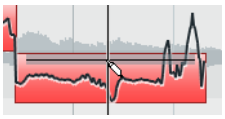
…and press [Alt]/[Option], the mouse pointer becomes a diagonal arrow…



…to indicate that you can rotate the micro-pitch curve.

4. Repeat the steps above to set anchors and tilt the micro-pitch curve until you are satisfied with the result.

   If you want to remove a tilt anchor from a segment, hold down [Alt]/[Option], position the mouse pointer at the top border of the segment until it turns to a glue tube, and click.



The tilt anchor is deleted.

RELATED LINKS

Understanding the waveform display in VariAudio on page 543

Straighten Pitch

If you want to compensate for the rise and fall of notes, i.e. the deviation of the micro-pitch curve from the representative pitch, you can use the Straighten Pitch slider. This correction comes in handy when a note is played flat (pitch rises) or sharp (the pitch falls) at the end.

PROCEDURE

1. Select the segments.
2. Move the Straighten Pitch slider to the right.

This micro-pitch looks a bit off. By moving the Straighten Pitch slider to the right…

…the micro-pitch curve is straightened.

The pitch of the selected segments is straightened.

MIDI Input

You can change the pitch on the fly by selecting the segment you want to change and pressing a key on your MIDI keyboard or using the Virtual Keyboard (NEK only).

PROCEDURE

1. After having corrected the segmentation, select the segment for which you would like to change the pitch.
2. Activate the Pitch & Warp tool and click MIDI Input .
3. Press a key on your MIDI keyboard or use the Virtual Keyboard (NEK only) to change the pitch of the segment.

   The pitch of the segment changes according to the note you play.

   The MIDI Input function has two modes: Still mode and Step mode . You can switch between them by [Alt]/[Option]-clicking on the MIDI Input button:

   In Still mode you can select individual segments by clicking on them and change their pitch by pressing a MIDI key. You can also select several segments and press a MIDI key to change the pitch of several segments simultaneously. The pitch of the first selected segment is changed to the pitch of the MIDI note you play. The pitches of the other selected segment are changed by the same amount.

   In Step mode you can step through the segments by selecting the first segment that you would like to change and pressing a MIDI key. The next segment will automatically be selected afterwards. This allows you to work in a more creative way, for example, to develop completely new melody lines via MIDI.
4. When you are done, deactivate the MIDI Input button.

   NOTE

   MIDI controller data like pitchbend or modulation are ignored.

RELATED LINKS

Virtual Keyboard (NEK only) on page 237

Warping segments

Time correction, i.e. warping at segment level, is useful if you want to align a musical accent to a certain position, or change or quantize the timing of single segments in monophonic vocal recordings. When warping audio segments, warp markers will be created. These are shown on the VariAudio and the AudioWarp tabs of the Sample Editor Inspector.

IMPORTANT

Any correction of the segmentation must be applied before warping segments.

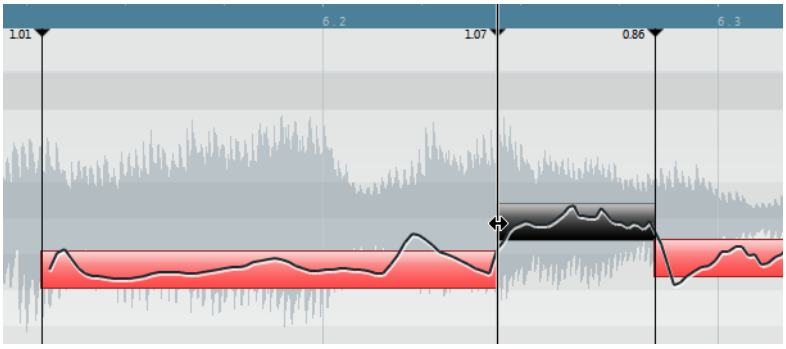
To warp a segment, proceed as follows:

PROCEDURE

1. On the VariAudio tab activate the Pitch & Warp tool.
2. To change the timing of a segment, move the mouse pointer over the start/end of the segment.

   The mouse pointer becomes a double arrow and the warp markers are displayed in the ruler.
3. Drag the start/end of the segment to the desired position.

   If the Snap button is activated, the segment border will snap to the grid. When you drag the segment border, warp markers are shown not only at the border but also at the adjacent segment borders to indicate which portions of the audio are stretched/affected.



NOTE

Warping a segment will also change the timing of the adjacent segments.

NOTE

Timing modifications introduced this way will not adapt to the project tempo. If this is what you want, use Musical Mode.

- You can change the insert position of a warp marker in the audio by clicking and dragging the warp marker handle in the ruler. This will change the warping.
- Hold down [Shift] (by default) to delete warp markers. To delete a warp marker, hold down the tool modifier so that the pointer becomes an eraser and click on the warp handle.
- If you are not satisfied with your changes, you can revert the timing of the selected segments by choosing the “Warp Changes” option from the Reset pop-up menu.

RELATED LINKS

Free Warp on page 531
Musical Mode on page 526
Editing warp markers on page 533
Reset on page 558

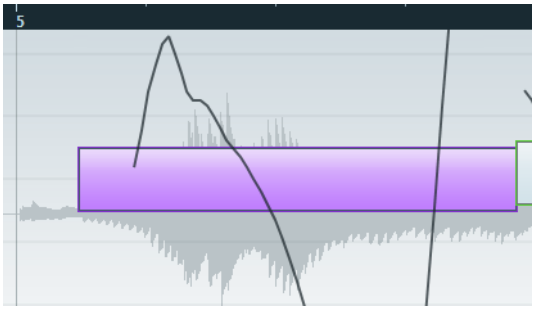
Editing Warp markers

In some cases the beginning of the waveform does not correspond to the beginning of a segment, e.g. when the audio starts with non-tonal portions like breath sounds. But when it comes to warping, any changes you wish to make must affect the waveform as a whole.

You can of course change the segmentation to achieve this, but if you want to pitch your audio afterwards, this would affect also any non-tonal portions of the audio. If this is not what you want, proceed as follows:

PROCEDURE

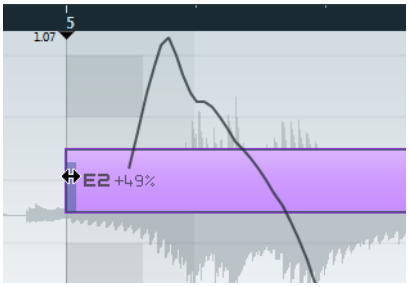
1. Activate the Pitch & Warp tool and activate the Snap button.



In this example the beginning of the segment does not correspond to the beginning of the waveform.

2. Move the mouse pointer over the start of the segment so that it becomes a double arrow and drag the segment start to the beginning of the bar.

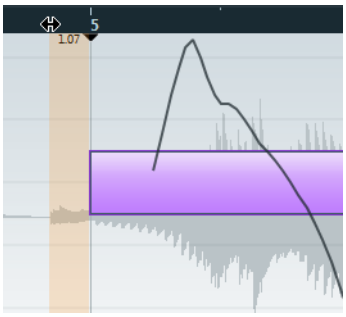
   The segment border snaps to the grid at the exact bar position.



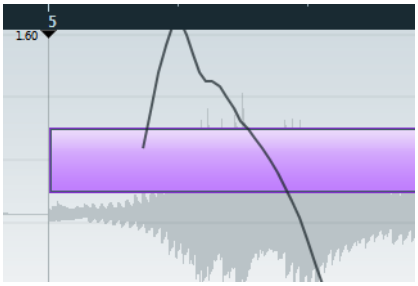
Now the beginning of the segment matches the beginning of the bar, but we want the beginning of the waveform to match the beginning of the bar:

3. Point at the warp handle displayed in the ruler so that it turns into a double arrow and drag it to the beginning of the waveform.

   The background is displayed in orange to indicate which part of the waveform is affected by the change.



Now the beginning of the waveform matches the desired bar position.



Editing warp markers can also be useful if you change the length of a segment that you have already warped. In this case, editing warp markers can help you synchronize your audio again.

RELATED LINKS

Understanding the waveform display in VariAudio on page 543

Reset

This pop-up menu at the bottom of the VariAudio tab allows you to reset the modifications you performed with the Pitch & Warp tool. It also lets you reset the changes you made in Segments mode by reanalyzing the audio and returning to the original segmentation. The following options are available:

Pitch Changes

If you select this option, pitch changes including micro-pitch modifications with the Tilt Micro Pitches tool are reset either for the selected segments (if available) or for the whole file.

Warp Changes

If you select this option, warp changes are reset.

Pitch + Warp Changes

If you select this option, pitch, micro-pitch, and warp changes are reset either for the selected segments (if available) or for the whole file.

Reanalyze Audio

If you select this option, the audio is reanalyzed and all your segmentation changes are reset.

NOTE

You can set up key commands for the reset and the reanalyze function in the Sample Editor category of the Key commands dialog.

RELATED LINKS

Key Commands on page 1168

Listening to your modifications

You can listen to the results of your modifications using the following methods:

- By activating Acoustic Feedback on the toolbar.

  The segments are played back so that you can easily audition your pitch modifications while editing.

- By using the Play tool on the toolbar.
- By using the Audition and the Audition Loop tool on the toolbar.
- By using cycle playback in the Project window.

If you want to compare the original to the modified audio (i.e. hear the audio without pitch or warp modifications), you have the following possibilities:

- You can disable your pitch modifications by clicking the Disable Pitch Changes button on the VariAudio tab or by setting up and using the “VariAudio - Disable Pitch Changes” key command in the Key Commands dialog, Sample Editor category.
- You can disable your warp modifications by clicking the Disable Warp Changes button on the AudioWarp tab or by setting up and using the “VariAudio – Disable Warp Changes” key command in the Key Commands dialog, Sample Editor category.

RELATED LINKS

Key Commands on page 1168

Extracting MIDI

You can extract a MIDI part from your audio. This is useful if you have an audio event with a certain tune and sound and you want to create an identical second tune with a MIDI instrument or VST instrument.

The extracted MIDI part can also be used to print out notes from within the Score Editor (NEK only) or it can be exported as a MIDI file. Furthermore, you can convert the audio to MIDI notes containing Note Expression data (NEK only) which allows you to adopt the modulation data for individual notes.

NOTE

- Before extracting MIDI from your audio you should correct the segmentation. Otherwise, you will have to correct segmentation errors later in the MIDI part. Transition changes, tilting of the micro-pitch curve, Quantize Pitch settings, and pitch corrections will also be taken into account.
- If your audio event references only a section of the audio clip, only this section will be extracted.

The quality of the resulting MIDI data depends on the quality and the characteristics of your audio.

To extract a MIDI part from your audio, proceed as follows:

PROCEDURE

1. Open the audio file that you want to extract a MIDI part from in the Sample Editor.
2. Open the VariAudio tab.
3. Activate Segments mode.
4. Click the “Extract MIDI…” button.

   The “Extract MIDI” dialog opens.
5. On the Pitch Mode pop-up menu, specify which data should be included when extracting the MIDI part. The following options are available:

Option	Description
Just Notes and No Pitchbend Data	Only notes are included in the MIDI part.
Notes and Static Pitchbend Data	A pitchbend event is created for each segment. Select a pitchbend value from 1 to 24 in the Pitchbend Range field. When you are working with an external MIDI device, it might be necessary to set it to the same value.
Notes and Continuous Pitchbend Data	Pitchbend events that correspond to the micro-pitch curve are created within the resulting MIDI part. Select a pitchbend value from 1 to 24 in the Pitchbend Range field. The setting should correspond to the value set on your MIDI device or the controlled VST instrument. Note that although the graphic representation of the pitchbend curve is smoothed, all pitchbend data is included.
Notes and NoteExp Pitchbend Curve	MIDI pitchbend events that correspond to the micro-pitch curve are created as Note Expression data for the resulting MIDI notes (NEK only).
Notes and NoteExp VST3 Tuning Curve	VST3 events for the “Tuning” parameter are created as Note Expression data for the resulting MIDI notes. Note that this works only with a connected VST instrument that is compatible with Note Expression (NEK only).

6. On the Volume Mode pop-up menu, specify how volume information from the audio is extracted to MIDI. The following options are available:

Option	Description
Fixed Velocity	All created MIDI notes get the same velocity. Select a velocity value in the Velocity field.
Dynamic Velocity	Each created MIDI note gets an individual velocity value according to the amplitude of the audio signal.
Volume Controller Curve	A continuous volume controller curve is created within the MIDI part. You can select the MIDI controller to be used for the curve in the MIDI Controller field.
NoteExp Volume Controller Curve	MIDI volume controller events are created as Note Expression data for the resulting MIDI notes (NEK only).
NoteExp VST3 Volume Curve	A VST3 volume curve is created as Note Expression data for the resulting MIDI notes. Note that this works only with a connected VST instrument that is compatible with Note Expression (NEK only).

7. On the Destination pop-up menu, specify where the MIDI part will be placed. The following options are available:

Option	Description
First Selected Track	The MIDI part will be placed on the first selected MIDI or instrument track. Note that any MIDI parts from previous extractions that are on this track will be deleted.
New MIDI Track	A new MIDI track will be created for the MIDI part.
Project Clipboard	The MIDI part is copied into the clipboard so that you can insert it at the desired position on a MIDI or instrument track in the Project window.

NOTE

If you have opened the Sample Editor from the Pool and the audio file is not part of your project, the MIDI part will be inserted at the beginning of the project.

8. Click OK.

RESULT

A MIDI part is created according to the specified settings.

You can also use a key command to extract a MIDI part from your audio. In this case no dialog opens and the settings that were used for the previous extraction are used.

RELATED LINKS

Exporting and importing standard MIDI files on page 1202
Segments mode on page 546
Key Commands on page 1168

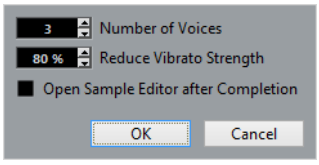
Generating Harmony Voices for Monophonic Audio

You can quickly harmonize monophonic audio using the “Generate Harmony Voices” function on the Audio menu.

This function automatically performs a VariAudio analysis, copies your event the specified number of times, and adds the resulting voices on separate tracks in the Project window. If you add a chord track (NEK only) to your project, the pitches of the resulting voices are altered to match the voicing of the chord track.

PROCEDURE

1. Import a monophonic audio file.
2. In the Project window, select the audio event.
3. On the Audio menu, select “Generate Harmony Voices…”.



4. Specify the number of voices that you want to create and enter a value for the vibrato reduction.

RESULT

The new voices follow the soprano, alto, tenor, and bass voices from the chord track voicing.

To open all voices in the Sample Editor, activate the “Open Sample Editor After Completion” option.

This allows you to view and edit the different voices.

NOTE

If you generate harmony voices without the chord track, the generated VariAudio segments of voice number 1 (soprano) are transposed three semitones upwards in relation to the original audio. The segments of voice numbers 2, 3, and 4 (alto, tenor, and bass) are transposed three, six, and nine semitones downwards.

RELATED LINKS

Chord Functions (NEK only) on page 890
Handling Several Audio Events on page 522

Flattening realtime processing

You can “flatten” realtime processing at any time. This can be done to serve two purposes: to reduce the CPU load and to optimize the sound quality of the processing.

Also use this function before applying any offline processing. When the flatten processing is applied, a copy of the original file is automatically created in the Pool so that the original audio clip remains intact.

The flatten function takes the following into account:

- Warp modifications, even when Bypass is activated. After the flattening, your Warp markers will be lost. However, you can undo this function as usual.
- VariAudio pitch modifications, even when Bypass is activated. After the flattening, your VariAudio data will be lost. However, you can undo this operation.
- Event transpose

PROCEDURE

1. Select the audio events that you want to process.
2. On the Audio menu, open the Realtime Processing submenu and select the Flatten command.

   Provided that the time stretching factor is not outside the range of 0.5 and 2, a dialog opens where you can select an algorithm for the processing.

   If the audio has been transposed, the dialog also contains the “Formant Correction” option. You can activate this, for example, if you want to avoid a “chipmunk voice” effect.
3. Select an algorithm preset and click OK.

   After the processing, any loop that was previously stretched in realtime or had been pitch shifted will play back exactly the same, but Musical Mode will be deactivated and the realtime pitch shifting will be set to 0.

   NOTE

   Instead of the Flatten menu command, you can click the Flatten button on the Process tab of the Sample Editor.

RESULT

The audio clip is now like any standard audio clip before applying realtime processing, i.e. it does not follow tempo changes. The flattening processing function is best used when you have determined the tempo or key of a project. If you want to adapt the audio to a new key or tempo after flattening, it is better to revert to the original audio clip rather than to process the already processed file again.

RELATED LINKS

Free Warp on page 531
Warping segments on page 555
Changing the pitch on page 550
Transposing individual parts or events using the info line on page 307

Selecting an algorithm for the flattening

When you flatten the realtime processing, you can use the MPEX 4 algorithm or the Realtime algorithm to process the audio. The MPEX 4 algorithm may produce better sound quality than the realtime processing. The Realtime algorithm corresponds to the algorithm preset selected on the Sample Editor toolbar.

NOTE

If you introduced VariAudio pitch modifications, the MPEX presets will not be available and the algorithm preset “Standard – Solo” is used automatically.

The Realtime presets can be selected from the Algorithm pop-up menu on the Sample Editor toolbar.

In the Pool, you can select an algorithm for several selected clips at a time.

RELATED LINKS

About time stretch and pitch shift algorithms on page 502
Selecting an algorithm for realtime playback on page 525

Unstretching audio files

By selecting “Unstretch Audio” from the Realtime Processing submenu of the Audio menu, all realtime time stretching (by sizing or by warp markers) is removed.

NOTE

Note that realtime transpose (in the info line) and Musical Mode will not be removed by this.

Whether the “Unstretch Audio” menu item is available depends on whether the time stretching has been applied at event or clip level:

- If you have sized an audio event in the Project window using “Sizing Applies Time Stretch”, you can undo the time stretching by selecting the event in the Project window and then applying “Unstretch Audio”.

  This removes all time stretching and warp markers.

- When you have entered a tempo and/or length on the toolbar, this information is saved for the source clip.

  These changes cannot be undone using “Unstretch Audio”.

RELATED LINKS

Resizing Events Using Time Stretch on page 202

Audio Part Editor

The Audio Part Editor allows you to view and edit the events inside audio parts. Essentially, this is the same type of editing that you do in the Project window.

Audio parts are created in the Project window in one of the following ways:

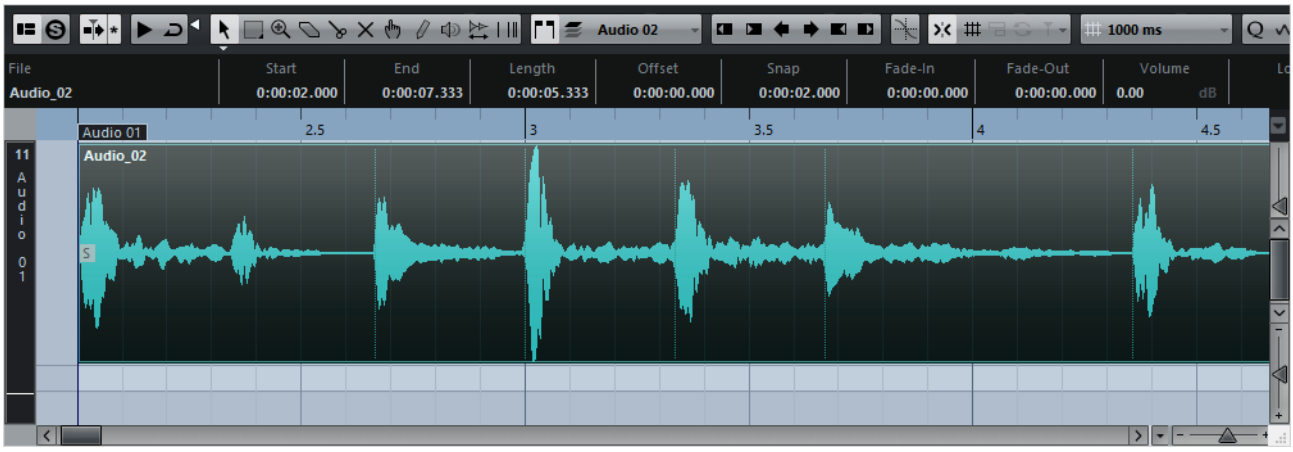
- Select one or several audio events on the same track, and select **Audio > Events to Part**.
- Glue together two or more audio events on the same track with the Glue tool.
- Draw an empty part with the Draw tool.
- Double-click between the left and right locators on an audio track.

With the last two methods, an empty part is created. You can then add events to the part by pasting, or by using drag and drop from the Pool.

RELATED LINKS

Project Window on page 43

Window Overview



Toolbar

The tools, settings, and icons on the toolbar have the same functionality as in the Project window, with the following differences:

- A Solo button.
- Separate tools for auditioning (Speaker) and scrubbing.
- No Line or Glue Tube tools.
- Play and Loop icons and an Audition Volume control.
- Independent Track Loop settings.
- Part List controls for handling several parts: activating parts for editing, restricting editing to active parts only and showing part borders.

NOTE

You can customize the toolbar by hiding or reordering its items.

RELATED LINKS

Auditioning on page 568
Scrubbing on page 570
Setting Up the Independent Track Loop on page 569
Handling Several Parts on page 570
Using the Setup options on page 1226

The Ruler and Info Line

These have the same functionality and appearance as their counterparts in the Project window.

You can select a separate display format for the Audio Part Editor ruler by clicking on the arrow button on the right and selecting an option from the pop-up menu.

RELATED LINKS

Ruler Display Formats on page 49

Opening the Audio Part Editor

The Audio Part Editor can display several parts at once, and you can also have more than one Audio Part Editor open at the same time.

PROCEDURE

1. Select one or more audio parts in the Project window.
2. Double-click on any one of them or use the Edit-Open key command, by default [Ctrl]/[Command]-[E].

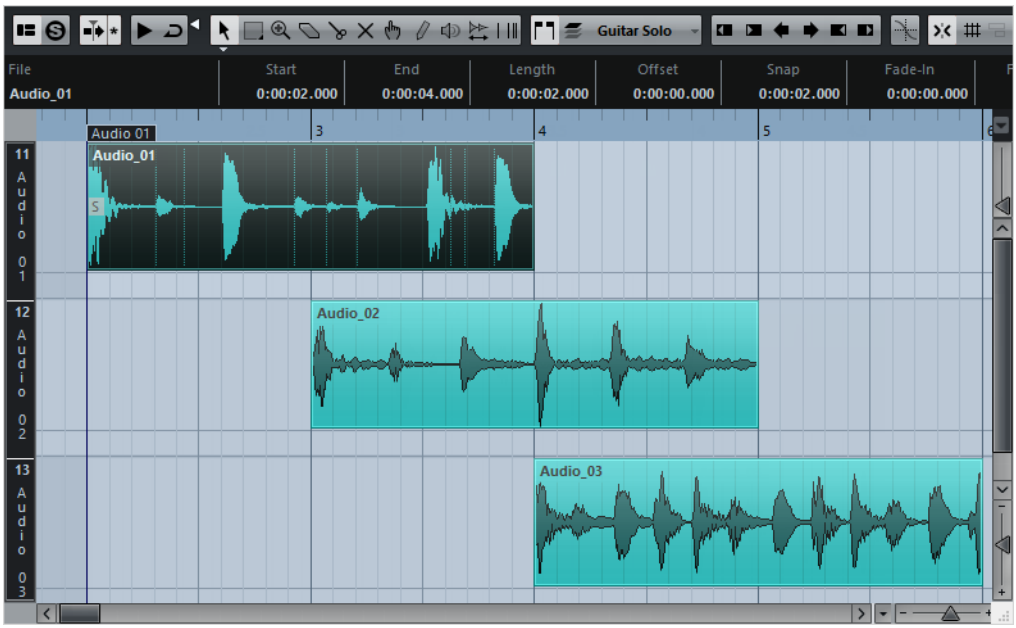
   Double-clicking on an audio event in the Project window will open the Sample Editor.

RELATED LINKS

Opening the Sample Editor on page 507

About Lanes

Lanes can make it easier to work with several audio events in a part. Moving some of the events to another lane can make selection and editing much easier.



If the Snap function is deactivated and you want to move an event to another lane without accidentally moving it horizontally, press [Ctrl]/[Command] while dragging it up or down.

RELATED LINKS

Track Handling on page 142

Operations

Zooming, selecting and editing in the Audio Part Editor are done just as in the Project window.

NOTE

If a part is a shared copy (i.e. you have previously copied the part by [Alt]/[Option]-[Shift] and dragging), any editing you perform will affect all shared copies of this part.

RELATED LINKS

Project Window on page 43

Auditioning

There are several ways to listen to the events in the Audio Part Editor.

By Using the Speaker Tool

If you click somewhere in the editor's event display with the Speaker tool and keep the mouse button pressed, the part will be played back from the position where you clicked. Playback will continue until you release the mouse button.

By Using the Audition Icon

Audition and Audition Loop icons

Clicking the Audition icon on the toolbar plays back the edited audio, according to the following rules:

- If you have selected events in the part, only the section between the first and last selected event will be played back.
- If you have made a range selection, only this section will be played back.
- If there is no selection, the whole part will be played back. If the project cursor is within the part, playback starts from the current cursor position. If the cursor is outside the part, playback starts from the beginning of the part.
- If the Audition Loop icon is activated, playback will continue until you deactivate the Audition icon. Otherwise, the section will be played back once.

When auditioning with the Speaker tool or Audition icon, audio will be routed directly to the Control Room or to the Main Mix (the default output bus) if the Control Room is disabled.

By Using Regular Playback

You can of course use the regular playback controls while in the Audio Part Editor. Furthermore, if you activate the Solo Editor button on the toolbar, only the events in the edited part will be played back.

Using Key Commands

If you activate the “Playback Toggle triggers Local Preview” option in the Preferences dialog (Transport page), you can start/stop auditioning by pressing [Space]. This is the same as clicking the Audition icon on the toolbar.

NOTE

The Audio Part Editor also supports the key commands “Preview start” and “Preview stop” in the Media category of the Key Commands dialog. These key commands stop the current playback, no matter if you are in normal playback or in audition mode.

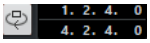
Setting Up the Independent Track Loop

The independent track loop is a sort of mini-cycle, affecting only the edited part. When the loop is activated, the events in the parts that are within the loop will be repeated continuously and completely independent – other events (on other tracks) are played back as usual. The only interaction between the loop and the regular playback is that the loop starts every time the cycle starts over again.

PROCEDURE

1. Turn on the loop by clicking the Independent Track Loop button on the toolbar.

   If it is not visible, right-click the toolbar and add the Independent Track Loop Settings section.

   When the loop is activated, the cycle is not shown in the editor’s ruler. Now you need to specify the length of the loop.

2. [Ctrl]/[Command]-click in the ruler to set the start and [Alt]/[Option]-click to set the end of the loop.

   NOTE

   You can also edit the loop start and end positions numerically in the fields next to the Loop button.

RESULT

The loop is indicated in purple in the ruler.

NOTE

The events will be looped as long as the Loop button is activated and the Audio Part Editor window is open.

RELATED LINKS

Using the Setup options on page 1226

Scrubbing

In the Audio Part Editor, the Scrub tool has a separate icon on the toolbar. Apart from that, scrubbing works exactly as in the Project window.

RELATED LINKS

Using the Scrub Tool on page 179

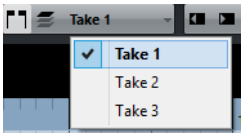
Handling Several Parts

When you open the Audio Part Editor with several parts selected – all on the same track or on different tracks – they might not all fit in the editor window, which can make it hard to get an overview of the different parts when editing.

Therefore, the toolbar features a few functions to make working with multiple parts easier and more comprehensive:

- The “Currently Edited Part” pop-up menu lists all parts that were selected when you opened the editor, and lets you select which part is active for editing.

  When you select a part from the list, it is automatically made active and centered in the display.

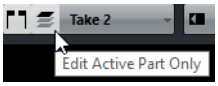
  

  NOTE

  Note that it is also possible to activate a part by clicking on it with the Object Selection tool.

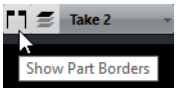
- The “Edit Active Part Only” button lets you restrict editing operations to the active part only.

  If you for example select “All” from the Select submenu of the Edit menu with this option activated, all events in the active part will be selected but not the events in other parts.

- You can zoom in on an active part so that it is displayed in its entirety in the window by selecting “Zoom to Event” from the Zoom submenu of the Edit menu.
- The “Show Part Borders” button can be used if you want to see clearly defined borders for the active part.

  When this is activated, all parts except the active one are grayed out, making the borders easily discernible. There are also two markers in the ruler with the name of the active part, marking its beginning and end. These can be moved freely to change the part borders.



- It is possible to cycle between parts, making them active using key commands.In the Key Commands dialog – Edit category, there are two functions: “Activate Next Part” and “Activate Previous Part”. If you assign key commands to these, you can use them to cycle between parts.

RELATED LINKS

Setting up key commands on page 1169

Options and Settings

The following options and settings are available in the Audio Part Editor:

Snap

The Snap functionality in the Audio Part Editor is exactly the same as in the Project window.

Auto-Scroll

When Auto-Scroll is activated on the toolbar, the window will scroll during playback, keeping the project cursor visible in the editor. This setting can be activated or deactivated individually for each window.

Snap to Zero Crossing

When this option is activated, all audio edits are done at zero crossings (positions in the audio where the amplitude is zero). This helps you avoid pops and clicks which might otherwise be caused by sudden amplitude changes.

RELATED LINKS

Snap Function on page 62

Pool

Every time that you record on an audio track, a file is created on your hard disk. A reference to this file, a clip, is added to the Pool.

The following rules apply to the Pool:

- All audio and video clips that belong to a project are listed in the Pool.
- Every project has a separate Pool.

The way the Pool displays folders and their contents is similar to the way the Windows Explorer/Mac OS Finder display folders and file lists. In the Pool, you can perform operations that affect files on disk and operations that only affect clips.

Operations That Affect Files

- Importing clips (audio files can automatically be copied and/or converted)
- Converting file formats
- Renaming clips (this also renames the referenced files on disk) and regions
- Deleting clips
- Preparing file archives for backup
- Minimizing files

Operations That Affect Clips

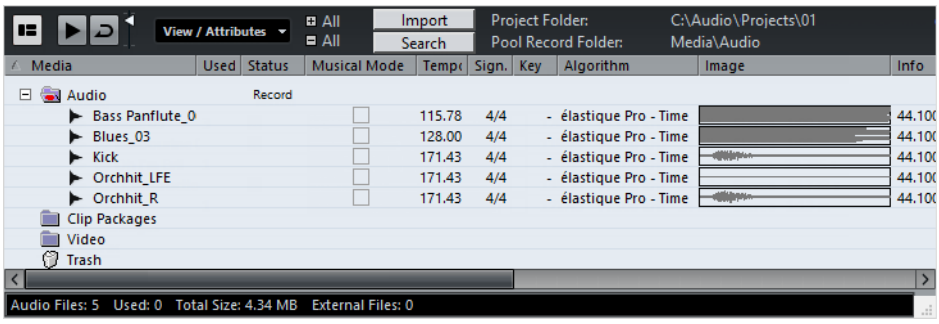
- Copying clips
- Auditioning clips
- Organizing clips
- Applying audio processing to clips
- Saving or importing complete Pool files

Pool Window

The Pool window allows you to manage the media files of the active project.

You can open the Pool in the following ways:

- On the **Project** window toolbar, click the **Open Pool Window** button. If this icon is not visible, you must activate the **Media & MixConsole Windows** option on the toolbar context menu.
- Select **Project > Pool**.
- Select **Media > Open Pool Window**.



The content of the Pool is divided into the following folders:

Audio Folder

Contains all audio clips and regions that are currently in the project.

Clip Packages Folder

Contains all imported or created clip packages.

Video Folder

Contains all video clips that are currently in the project.

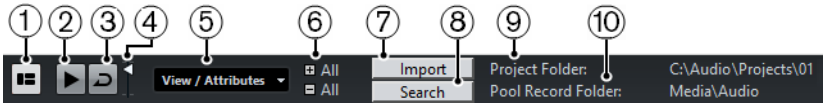
Trash Folder

Contains unused clips that have been moved here for later permanent removal from the hard disk.

NOTE

You cannot rename or delete these folders, but you can add any number of subfolders.

Toolbar



1) **Show Info**
   Activates/deactivates the info line.

2) **Audition**
   If this option is activated and you select a clip in the Pool, it is played back.

3) **Audition Loop**
   If this option is activated, the playback of the selected clip is looped.

4) **Volume**
   Lets you specify the playback volume.

5) **View/Attributes**
   Lets you activate/deactivate which attributes are displayed in the **Pool** window. You can also define custom user attributes.

6) **Open/Close all folders**
   Opens/Closes all folders.

7) **Import**
   Lets you import media files to the Pool.

8) **Search**
   Lets you search the Pool and connected disks for media files.

9) **Project Folder**
   Displays the path to the folder of the active project.

10) **Pool Record Folder**
    Displays the path to the record folder of the active project. By default, this is the `Audio` folder. However, you can create a new `Audio` subfolder and designate this as your Pool record folder.

Pool Window Columns

Various information about the clips and regions can be viewed in the Pool window columns. The columns contain the following information:

Media

Contains the Audio, Video, and Trash folders. If the folders are opened, the clip or region names are shown and can be edited.

Used

Displays how many times a clip is used in the project. If there is no entry in this column, the corresponding clip is not used.

Status

Displays various icons that relate to the current Pool and clip status. The following symbols can be displayed:

- Record
  Indicates the current Pool record folder.
- 
  Indicates that a clip has been processed.
- ?
  Indicates that a clip is referenced in the project but missing from the Pool.
- 
  Indicates that the file the clip related to is external, for example, located outside the current Audio folder for the project.
- 
  Indicates that the clip has been recorded in the currently open version of the project. This is useful for finding recently recorded clips quickly.

Musical Mode

You can use the Musical Mode to tempo-match audio loops to the project tempo. The checkbox in this column allows you to activate or deactivate Musical Mode. If the Tempo column displays “???”, you must enter the correct tempo before you can activate Musical Mode.

Tempo

Displays the tempo of audio files, if available. If no tempo has been specified, the column displays “???”.

Sign.

Displays the time signature, for example, “4/4”.

Key

Displays the root key if one has been specified for the file.

Algorithm

Displays the algorithm preset that is used if the audio file is processed.

- To change the default preset, click the preset name and select another preset from the pop-up menu.

Info

For audio clips, this column displays the sample rate, bit resolution, number of channels, and length.

For regions, it displays start and end times in frames.

For video clips, it displays the frame rate, resolution, number of frames, and length.

Type

Displays the file format of the clip.

Date

Displays the date when the audio file was last changed.

Origin Time

Displays the original start position where a clip was recorded in the project. As this value can be used as a basis for the **Insert into Project** option in the **Media** or context menu, you can change it if the Origin Time value is independent (for example, not for regions).

You can change the value by editing the value in the column, or by selecting the corresponding clip in the Pool, moving the project cursor to the new position and selecting **Audio > Update Origin**.

Image

Displays waveform images of audio clips or regions.

Path

Displays the path to the location of a clip on the hard disk.

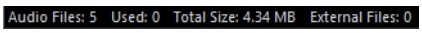
Reel Name

If you have imported an OMF file, it may include this attribute, which is then shown in this column. The Reel Name describes the reel or tape from which the media was originally captured.

Info Line

The info line displays additional information regarding the files in the pool.

- To activate the info line, click the **Show Info** button at the left of the toolbar.



The info line shows the following information:

Audio Files

The number of audio files in the Pool.

Used

The number of audio files in use.

Total Size

The total size of all audio files in the Pool.

External Files

The number of files in the Pool that do not reside in the project folder (for example, video files).

Customizing the View

You can set up which columns are shown or hidden and rearrange the order of the columns in the Pool.

- To specify which columns are shown or hidden, open the **View/Attributes** menu on the toolbar, and activate or deactivate items.
- To rearrange the order of columns, drag a column heading to the left or right.

Working with the Pool

NOTE

Most of the Pool-related main menu functions are also available on the Pool context menu.

Renaming Clips or Regions in the Pool

IMPORTANT

Renaming clips or regions in the Pool also renames the referenced files on disk. It is recommended to rename clips or regions in the Pool. Otherwise, the reference from the clip to the file may get lost.

PROCEDURE

1. In the **Pool** window, select a clip or region, and click the existing name.
2. Type in a new name and press [Return].

RELATED LINKS

About Missing Files on page 585

Renaming Multiple Clips or Regions in the Pool

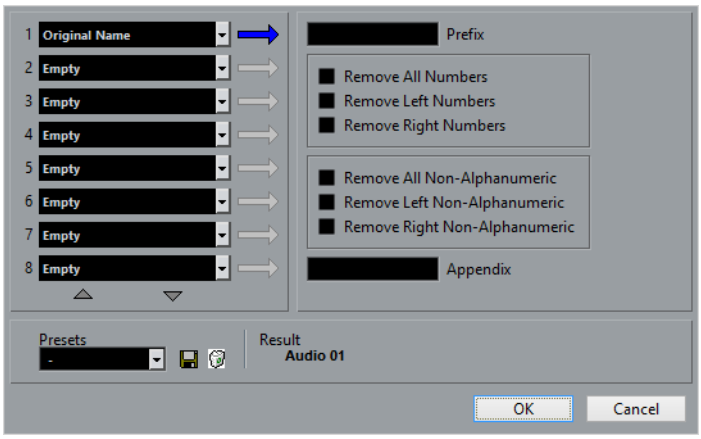
PROCEDURE

1. In the **Pool** window, select the clips or regions that you want to rename.
   You can only select one type of object at a time.
2. Select **Edit > Rename Objects**.
   A dialog with several renaming options opens.
3. In the dialog, set the parameters for renaming object and click **OK**.

Rename Objects Dialog

The **Rename Objects** dialog allows you to add prefixes, suffixes, and incremental numbers to names. You can also remove certain characters, include timestamp information, and more.

In the **Pool** window, right-click a clip and select **Edit - Rename Objects**, or select a clip and select **Edit > Rename Objects**.



Each of the fields found in the left section of the **Rename Objects** dialog can be used to add an element to the name for each object.

Depending on the selected element, different renaming options are available on the right side of the dialog. The following elements are available:

Free Text

Any text that you want to include in the name.

Original Name

The original name given to the object. There are options to remove all numbers, non-alpha numerics, or only numbers at the beginning or end of the name.

Number

An increasing or decreasing number starting with a minimum amount of digits and a starting number (for example, 001, 002, etc.).

Project Time

The current location of the clip in the project window using any of the seven ruler formats (Bars+Beats, Timecode, etc.).

Date

Creation date of the file in several formats.

File Extension

The file type.

Audio Bitsize

The bit depth of the audio file.

Sample Rate

The sample rate of the audio file.

Audio Tempo

The audio tempo for the clip if it has been assigned.

User Attribute

Any of the custom attributes created in the **Setup User Attributes** dialog.

NOTE

- You can use a prefix to create a space that separates items in the generated name.
- An example of the result is displayed at the bottom of the window. You can also save all of these parameters as a preset.

Duplicating Clips in the Pool

You can create duplicates of clips and apply different processing methods to them.

NOTE

Duplicating a clip does not create a new file on disk, but a new edit version of the clip that refers to the same audio file.

PROCEDURE

1. In the **Pool** window, select the clip that you want to duplicate.
2. Select **Media > New Version**.

RESULT

A new version of the clip appears in the same Pool folder. The duplicated clip has the same name as the original but with a version number after it. Regions within a clip are also copied, but keep their name.

Inserting Clips into a Project

To insert a clip into a project, you can either use the insert commands on the **Media** menu or use drag and drop.

Inserting Clips into a Project Via Menu Commands

PROCEDURE

1. In the **Pool** window, select the clips that you want to insert into the project.
2. Select **Media > Insert into Project** and select one of the insert options.

   If several clips are selected, choose whether to insert them on one track or each on a different track.

   NOTE

   The clips are positioned so that their snap points are aligned with the selected insert position. If you want to adjust the snap point before inserting a clip, double-click a clip to open the Sample Editor. Here, you can adjust the snap position and then perform the insert options.

RESULT

The clip is inserted on the selected track or on a new audio track. If several tracks are selected, the clip will be inserted on the first selected track.

RELATED LINKS

Adjusting the snap point on page 517

Inserting Clips into a Project Via Drag and Drop

You can drag a clip from the Pool into the **Project** window.

Snap is taken into account if the snap option is activated.

While you drag the clip into the **Project** window, its position is indicated by a marker line and a numerical position box. These indicate the position of the snap point in the clip.

If you position the clip in an empty area in the event display (for example, below existing tracks), a new track is created for the inserted event.

RELATED LINKS

Adjusting the snap point on page 517

Deleting Clips from the Pool

You can delete clips from the Pool with or without deleting the corresponding file from the hard disk.

Removing Clips from the Pool

NOTE

Removing clips from the Pool does not delete the corresponding file from the hard disk.

PROCEDURE

1. In the **Pool** window, select the clips that you want to remove, and select **Edit > Delete**

   You can also press [Backspace] or [Delete].

2. Depending on whether the clips are used by an event, you have the following options:
   - If the clips are used by an event, click **Remove** and then click **Remove from Pool**.
   - If the clips are not used by an event, click **Remove from Pool**.

RESULT

The clips are no longer available in the Pool for this project, but the files still exist on the hard disk and can be used in other projects, etc. This operation can be undone.

Deleting Files from the Hard Disk

To delete a file permanently from the hard disk, you must first move the corresponding clips to the Trash folder in the Pool.

IMPORTANT

- Before you permanently delete audio files from the hard disk, make sure that they are not used in another project.
- The following operation cannot be undone.

PROCEDURE

1. In the **Pool** window, select the clips that you want to delete from the hard disk, and select **Edit > Delete**.

   You can also press [Backspace] or [Delete], or drag the clips into the Trash folder.

   NOTE

   You can retrieve a clip or region from the Trash folder by dragging it back into an Audio or Video folder.

2. Depending on whether the clips are used by an event, you have the following options:
   - If the clips are used by an event, click **Remove** and then click **Trash**.
   - If the clips are not used by an event, click **Trash**.

3. Select **Media > Empty Trash**.
4. Click **Erase**.

RESULT

The files are deleted from the hard disk.

Removing Unused Clips from the Pool

You can find all clips in the Pool that are not used in the project. This allows you to quickly remove all unused clips.

PROCEDURE

1. In the Pool, select **Media > Remove Unused Media**.
2. Do one of the following:
   - To move the clips to the Trash folder, select **Trash**.
   - To remove the clips from the Pool, select **Remove from Pool**.

Removing Regions from the Pool

PROCEDURE

- In the Pool, select a region and select **Edit > Delete**.
  You can also press [Backspace] or [Delete].

  IMPORTANT

  You are not warned if the region is still in use.

Locating Events and Clips

You can quickly display to which clips the selected events belong to and to which events the selected clips belong to.

Locating Events via Clips in the Pool

You can find out which events in the project refer to a particular clip in the Pool.

PROCEDURE

1. In the **Pool** window, select one or more clips.
2. Select **Media > Select in Project**.

RESULT

All events that refer to the selected clips are now selected in the **Project** window.

Locating Clips via Events in the Project Window

You can find out which clip belongs to a particular event in the **Project** window.

PROCEDURE

1. In the **Project** window, select one or more events.
2. Select **Audio > Find Selected in Pool**.

RESULT

The corresponding clips are located and highlighted in the Pool.

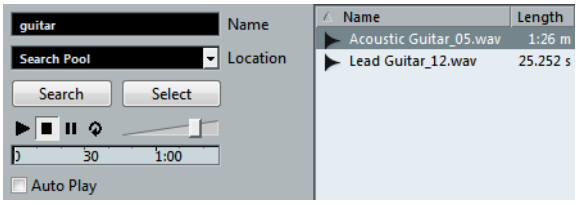
Searching for Audio Files

The search functions help you locate audio files in the Pool, on your hard disk, or on other media. This works much like the regular file search, but with extra features.

PROCEDURE

1. In the **Pool** window, click the **Search** button on the toolbar.

   A search pane appears at the bottom of the window, displaying the search functions.



2. Specify the files that you search for in the **Name** field.

   You can use partial names or wildcards (*).

   NOTE

   Only audio files of the supported formats will be found.

3. Use the **Location** pop-up menu to specify where to search.

   The pop-up menu lists all your local drives and removable media.

   - To limit the search to certain folders, select **Select Search Path**, and in the dialog that opens, select the folder in which you want to search.

   The search will include the selected folder and all subfolders.

   NOTE

   Folders that you have recently selected using the **Select Search Path** function appear on the pop-up menu, so that you can quickly select them again.

4. Click the **Search** button.

   The search is started and the **Search** button is labeled **Stop**.

   - To cancel the search, click **Stop**.

   When the search is finished, the files that are found are listed on the right.

   - To audition a file, select it in the list and use the playback controls to the left (Play, Stop, Pause, and Loop). If **Auto Play** is activated, selected files are automatically played back.
   - To import a file into the Pool, double-click the file in the list or select it and click the **Import** button.

5. To close the search pane, click the **Search** button on the toolbar again.

Using the Extended Search Functionality

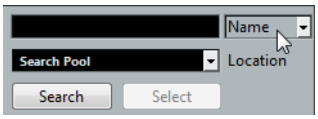
Apart from the search criterion Name, additional search filters and user attributes are available. The extended search options allow for a detailed search, helping you to master even the largest sound database.

PROCEDURE

1. Optional: Create user attributes.
2. In the **Pool** window, click the **Search** button on the toolbar.

   The Search pane is displayed in the lower part of the Pool window.

3. Click the **Name** text to open the extended search pop-up menu where you can select and define a search criterion.

   The menu also contains the user attributes that you specified, as well as the **Add Filter** and **Presets** submenus.

   The search criteria have the following parameters:

   - **Name**: partial names or wildcards (*)
   - **Size**: Less than, More than, Equal, Between (two values), in seconds, minutes, hours, and bytes
   - **Bitsize** (resolution): 8, 16, 24, 32
   - **Channels**: Mono, Stereo, and from 3 to 16
   - **Sample Rate**: various values, choose **Other** for free setting
   - **Date**: various search ranges

4. Select one of the search criteria in the pop-up menu.

   The search criteria changes to the selected criteria.

5. Optional: To display more search options, open the extended search pop-up menu, select the **Add filter** submenu, and select an element.

6. Optional: To save your search filter settings as a preset, open the extended search pop-up menu, select **Presets > Save Preset**, and enter a name for the preset.

   Saved presets are added to the **Presets** submenu.

7. Optional: To remove a search filter settings preset, open the extended search pop-up menu, select the preset, and then select **Remove Preset**.

RELATED LINKS

User Attributes on page 591

Find Media Window

The **Find Media** window is a stand-alone window that offers the same functionality as the **Search Media** option in the Pool.

- To open the **Find Media** window, select **Media > Search Media**.
- To insert a clip or region into the project from the **Find Media** window, select it in the list, select **Media > Insert into Project**, and select one of the insert options.
- To refine the search options, you can include your user attributes in the search criteria.

  All attributes that have been defined appear on the pop-up menu.

RELATED LINKS

Inserting Clips into a Project on page 579
User Attributes on page 591

About Missing Files

When you open a project and one or more files are missing, the **Resolve Missing Files** dialog opens. If you click **Close**, the project opens without the missing files.

In the Pool, you can check which files are considered missing. This is indicated by a question mark in the **Status** column.

A file is considered missing under one of the following conditions:

- The file has been moved or renamed outside the program since you last worked with the project, and you ignored the **Resolve Missing Files** dialog when you opened the project for the current session.
- You have moved or renamed the file outside the program during the current session.
- You have moved or renamed the folder in which the missing files are located.

Locating Missing Files

PROCEDURE

1. Select **Media > Find Missing Files**.
2. In the **Resolve Missing Files** dialog, decide if you want the program to find the file for you (**Search**), if you want to find it yourself (**Locate**), or if you want to specify in which directory the program will search for the file (**Folder**).
   - If you select **Search**, a dialog opens to let you specify which folder or disk will be scanned by the program. Click the **Search Folder** button, select a directory or a disk, and click the **Start** button. If found, select the file from the list and click **Accept**. Afterwards Nuendo tries to map all other missing files automatically.
   - If you select **Locate**, a file dialog opens, allowing you to locate the file manually. Select the file and click **Open**.
   - If you select **Folder**, a dialog opens to let you specify the directory in which the missing file can be found. This might be the preferred method if you have renamed or moved the folder containing the missing file, but the file still has the same name. Once you select the correct folder, the program finds the file and you can close the dialog.

Reconstructing Missing Edit Files

If a missing file cannot be found, this is normally indicated with a question mark in the **Status** column in the Pool. However, if the missing file is an edit file (a file that is created when you process audio and stored in the Edits folder within the project folder), it may be possible for the program to reconstruct it by recreating the editing to the original audio file.

PROCEDURE

1. In the **Pool** window, locate the clips for which files are missing.
2. Check the **Status** column. If the status of the files is “Reconstructible”, the files can be reconstructed by Nuendo.
3. Select the reconstructable clips and select **Media > Reconstruct**.

RESULT

The editing is performed and the edit files are recreated.

Removing Missing Files from the Pool

If the Pool contains audio files that cannot be found or reconstructed, you may want to remove these.

PROCEDURE

- In the **Pool** window, select **Media > Remove Missing Files**.

RESULT

All missing files from the Pool and the corresponding events from the **Project** window are removed.

Auditioning Clips in the Pool

You can audition clips in the Pool using key commands, the **Audition** button, or by clicking in the waveform image for a clip.

- Key commands

  If you activate the **Playback Toggle triggers Local Preview** option in the Preferences dialog (Transport page), you can use [Space] to audition. This is the same as activating the **Audition** button on the toolbar.

- Select a clip and activate the **Audition** button.

  The whole clip plays back. To stop playback, click the **Audition** button again.

- Click in the waveform image for a clip.

  The clip plays back from the selected position in the waveform until the end. To stop playback, click the **Audition** button or anywhere else in the **Pool** window.

The audio is routed directly to the Control Room, if activated. When the Control Room is deactivated, the audio is routed to the Main Mix (the default output) bus, bypassing the settings of the audio channel, effects, and EQs.

NOTE

You can adjust the auditioning level with the miniature level fader on the toolbar. This does not affect the regular playback level.

If you have activated the **Audition Loop** button before you audition, the following happens:

- When you click the **Audition** button to audition a clip, the clip is repeated indefinitely until you stop playback by clicking the **Audition** or **Audition Loop** button again.
- When you click in the waveform image to audition, the section from the selected point to the end of the clip is repeated indefinitely until you stop playback.

Opening Clips in the Sample Editor

The Sample Editor allows you to perform detailed editing on the clip.

- To open a clip in the Sample Editor, double-click a clip waveform icon or a clip name in the **Media** column.
- To open a certain region of a clip in the Sample Editor, double-click a region in the Pool.

You can use this to set a snap point for a clip, for example. When you later insert the clip from the Pool into the project, the defined snap point allows it to be properly aligned.

RELATED LINKS

Adjusting the snap point on page 517
Sample Editor on page 506

Importing Media

The **Import Medium** dialog lets you import files directly into the Pool.

To open the dialog, select **Media > Import Medium**, or click the **Import** button on the Pool toolbar.

This opens a standard file dialog, where you can navigate to other folders, audition files, etc. The following audio file formats can be imported:

- Wave (Normal or Broadcast)
- AIFF and AIFC (Compressed AIFF)
- MXF (Material Exchange Format)
- REX or REX 2
- FLAC (Free Lossless Audio Codec)
- SD2 (Sound Designer II) (Mac only)
- MPEG Layer 2 and Layer 3 (MP2 and MP3 files)
- Ogg Vorbis (OGG files)
- Windows Media Audio (Windows only)
- Wave 64 (W64 files)

The following characteristics are possible:

- Stereo or mono
- Any sample rate

  NOTE

  Files that have a different sample rate than the project sample rate are played back at the wrong speed and pitch.

- 8, 16, 24, or 32 bit float resolution
- Various video formats

NOTE

You can also use the commands on the **Import** submenu of the **File** menu to import audio or video files into the Pool.

RELATED LINKS

Broadcast Wave files on page 1031
Importing ReCycle files on page 1192
Importing compressed audio files on page 1193
Video File Compatibility on page 1100

Importing Audio CDs in the Pool

You can import tracks or sections of tracks from an audio CD directly into the Pool. This opens a dialog in which you can specify which tracks are copied from the CD, converted to audio files, and added to the Pool.

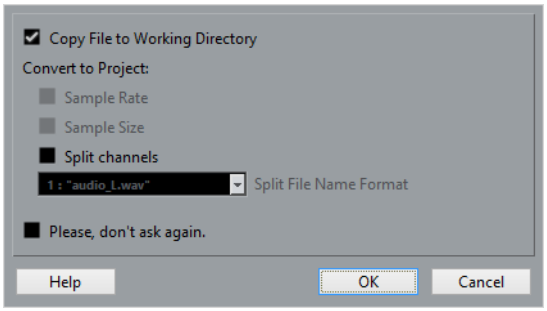
- To import an audio CD to the Pool, select **Media > Import Audio CD**.

RELATED LINKS

Importing audio CD tracks on page 1188

Import Options Dialog

When you select a file in the **Import Medium** dialog and click **Open**, the **Import Options** dialog opens.



Copy File to Working Directory

If this option is activated, the file is copied to the Audio folder of the project, and the clip refers to this copy.

If the option is deactivated, the clip refers to the original file in the original location and will be marked as “external” in the Pool.

Convert to Project

If you are importing a single audio file, you can convert the sample rate provided that the sample rate is different than the one set for the project. You can also convert the sample size provided that the sample size is lower than the record format that is used in the project.

If you are importing several audio files at once, the **Import Options** dialog contains a **Convert and Copy to Project if needed** checkbox instead. When this option is activated, the imported files will be converted only if the sample rate is different or if the sample size is lower than the project sample size.

Split Channels/Split Multi-Channel Files

If this option is activated, the stereo or multi-channel audio files are split into a corresponding number of mono files, one for each channel.

NOTE

If this option is activated, the imported files are copied to the Audio folder of the project's working directory.

If you import files via **File > Import**, the split files are inserted into the project and into the Pool as separate mono tracks.

If you import files via **Media > Import Medium**, the split files are only inserted into the Pool.

In all cases, the **Split File Name Format** pop-up menu lets you specify how the split files are named. This allows for compatibility with other products when exchanging audio files and avoids confusion if the source file contains no stereo or surround material, but poly-mono audio.

Please, don't ask again

If this option is activated, files will always be imported according to the settings that you have made, without this dialog appearing. This can be reset in the Preferences dialog (**Editing > Audio**).

NOTE

You can also convert files later with the **Convert Files** or **Conform Files** options.

RELATED LINKS

Status on page 575
Converting Files on page 595
Conforming Files on page 596

Exporting Regions as Audio Files

If you have created regions within an audio clip, these can be exported as separate audio files. If you have two clips that refer to the same audio file, you can create a separate audio file for each clip.

PROCEDURE

1. In the **Pool** window, select the region that you want to export.
2. Select **Audio > Bounce Selection**.
3. Select the folder in which you want the new file to be created and click **OK**.
4. If you are using the **Bounce Selection** option to create a separate audio file for a clip that refers to the same audio file as another clip, enter a name for the new audio file.

RESULT

A new audio file is created in the specified folder. The file has the name of the region and is automatically added to the Pool.

RELATED LINKS

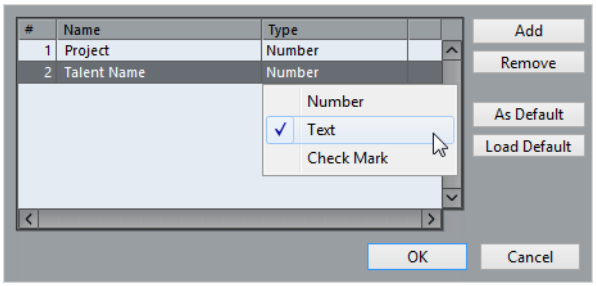
Working with regions on page 522

User Attributes

You can define your own attributes for elements in the Pool. This is useful if you have a large number of audio files in the Pool. You can use the attributes, for example, to sort items in the Pool.

User attributes have their own columns in the Pool. Each attribute can be defined as checkbox, text field, or number. You can then specify the user attributes for each file, thus categorizing them further.

All user attributes that you create are automatically available as search criteria in the Pool. In the search pane, you can search for values in the user attributes. This allows for a very detailed search and helps you master even the largest sound database.



Creating User Attributes

PROCEDURE

1. In the **Pool** window, open the **View/Attributes** pop-up menu, and select **Define User Attributes**.
2. In the **Set up User Attributes** dialog, click the **Add** button.

   A new attribute is added to the attributes list.
3. In the attributes list, enter a name and select an attribute type for the new attribute.
4. Add as many user attributes as you need.
5. Click **OK**.

RESULT

The user attributes get their own columns in the Pool.

Changing the Pool Record Folder

All audio clips that you record in the project will end up in the Pool Record folder. The Pool Record folder is indicated by the text Record in the Status column and by a red dot on the folder itself.

By default, this is the main Audio folder. However, you can create a new Audio subfolder and designate this as your Pool Record folder.

NOTE

The folders that you create in the Pool are only for organizing your files in the Pool. All files are recorded to the folder that you specified as the Pool Record Folder.

PROCEDURE

1. In the Pool, select the Audio folder or any audio clip.

   NOTE

   You cannot designate the Video folder or any of its subfolders as the Pool Record folder.

2. Select **Media > Create Folder**.
3. Rename the new folder.
4. Select the new folder and select **Media > Set Pool Record Folder**, or click in the **Status** column of the new folder.

RESULT

The new folder becomes the Pool Record folder. Any audio recorded in the project will be saved in this folder.

Organizing Clips and Folders

If you accumulate a large number of clips in the Pool, it can be difficult to quickly find specific items. Organizing clips in new subfolders with names that reflect the content can be a solution. For example, you could put all sound effects in one folder, all lead vocals in another, etc.

PROCEDURE

1. In the **Pool** window, select the type of folder, audio or video, for which you want to create a subfolder.

   NOTE

   You cannot put audio clips in a video folder and vice versa.

2. Select **Media > Create Folder**.

3. Rename the folder.
4. Drag the clips to the new folder.

Applying Processing to Clips in the Pool

You can apply audio processing to clips from within the Pool in the same way as to events in the **Project** window.

PROCEDURE

1. In the **Pool** window, select the clips that you want to process.
2. Select **Audio > Process** and select a processing method.

RESULT

A red and gray waveform symbol indicates that the clips have been processed.

RELATED LINKS

Audio processing and functions on page 468

Undoing Processing

You can undo processing that has been applied to clips.

PROCEDURE

1. In the **Pool** window, select the clip from which you want to remove the processing.
2. Select **Audio > Offline Process History**.
3. Select the action that you want to remove, and click **Remove**.

Minimizing Files

You can minimize the audio files according to the size of the audio clips referenced in the project. The files that are produced using this option only contain the audio file portions that are actually used in the project.

This can significantly reduce the size of the project if large portions of the audio files are unused. Therefore, the option is useful for archiving purposes after you have completed a project.

IMPORTANT

This operation will permanently change the selected audio files in the Pool. This cannot be undone. If you only want to create the minimized audio files as a copy, leaving the original project untouched, you can use the **Back up Project** option.

NOTE

Minimizing files clears the entire edit history.

PROCEDURE

1. In the **Pool** window, select the files that you want to minimize.
2. Select **Media > Minimize File**.
3. Click **Minimize**.

   After the minimizing is finished, the file references in the stored project have become invalid.
4. Do one of the following.
   - To save the updated project, click **Save Now**.
   - To proceed with the unsaved project, click **Later**.

RESULT

Only the audio portions that are actually used in the project remain in the corresponding audio files in the Pool Record folder.

RELATED LINKS

Backing Up Projects on page 84

Importing and Exporting Pool Files

You can import or export a Pool as a separate file (file extension ".npl").

- To import a Pool file, select **Media > Import Pool**.

  When you import a Pool file, its file references are added to the current Pool.

  NOTE

  Since the audio and video files are only referenced but not saved in the Pool file, the Pool import is only useful if you have access to all referenced files. These files have preferably the same file paths as when the Pool was saved.

- To export a Pool file, select **Media > Export Pool**.

You can also save and open libraries, that is, stand-alone Pool files that are not associated with a project.

RELATED LINKS

Working with Libraries on page 595

Working with Libraries

You can use libraries to save sound effects, loops, video clips, etc., and transfer media from a library into a project by using drag and drop.

- To create a new library, select **File > New Library**.

  You must specify a project folder for the new library in which media files will be stored. The library appears as a separate Pool window.

- To open a library, select **File > Open Library**.
- To save a library, select **File > Save Library**.

Converting Files

In the Pool, you can convert files to another format or change file attributes.

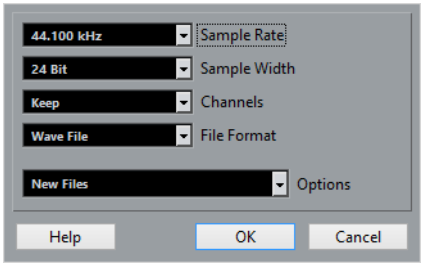
PROCEDURE

1. In the **Pool** window, select the files that you want to convert.
2. Select **Media > Convert Files**.
3. In the **Convert Options** dialog, make your settings and click **OK**.

Convert Options Dialog

In this dialog, you can change the file format and attributes of audio files in the Pool.

To open the **Convert Options** dialog, select a clip in the **Pool** window, and select **Media > Convert Files**.



Sample Rate

Allows you to convert to another sample rate.

Sample Width

Allows you to convert to 16 Bit, 24 Bit, or 32 Bit Float.

Channels

Allows you to convert to Mono or Stereo Interleaved.

File Format

Allows you to convert to Wave, AIFF, MXF, FLAC, Wave64, or Broadcast Wave format.

Options

You can use the **Options** pop-up menu to set one of the following options:

- **New Files**
  Creates a copy of the file in the audio folder and converts this new file according to the chosen attributes. The new file is added to the Pool, but all clip references still point to the original, unconverted file.
- **Replace Files**
  Converts the original file without changing clip references. However, the references are saved with the next save action.
- **New + Replace in Pool**
  Creates a new copy with the chosen attributes, replaces the original file with the new one in the Pool and redirects the current clip references from the original file to the new file. Select the latter option if you want your audio clips to refer to the converted file, but want to keep the original file on disk, for example, if the file is used in other projects.

Conforming Files

You can align the file attributes with the project attributes. This is useful if the attributes of the selected files are different from the project attributes.

PROCEDURE

1. In the **Pool** window, select the clips that you want to conform.
2. Select **Media > Conform Files**.
3. Select whether to keep or replace the original unconverted files in the Pool.
   - If you select the **Replace** option, files in the Pool and in the Audio folder of the project are replaced.
   - If any **Keep** option is selected, original files remain in the Audio folder of the project and new files are created.

RESULT

The files are conformed. Clip or event references in the Pool are redirected to the conformed files.

Extracting Audio from Video File

You can extract audio from video files. This automatically generates a new audio clip that appears in the Pool Record folder.

NOTE

This function is not available for MPEG-1 and MPEG-2 video files.

PROCEDURE

1. In the **Pool** window, select **Media > Extract Audio from Video File**.
2. Select the video file from which you want to extract audio and click **Open**.

RESULT

The audio is extracted from the video file. The audio file gets the same file format and sample rate/width as in the current project, and the same name as the video file.

MediaBay

With the **MediaBay**, you can manage all your media files and presets from multiple sources.

To open the **MediaBay**, select **Media > MediaBay**, or press [F5].

The **MediaBay** is divided into several sections:

1) **Define Locations**

Allows you to create presets for locations on your system that you want to scan for media files.

2) **Locations**

Allows you to switch between the previously defined locations.

3) **Filters**
Allows you to filter the results list using a logical or an attribute filter.

4) **Results**
Displays all found media files. You can filter the list and perform text searches.

5) **Previewer**
Allows you to preview the files shown in the results list.

6) **Attribute Inspector**
Allows you to view, edit, and add media file attributes or tags.

Working With the MediaBay

When working with many media files, the most important thing is to find the content that you need quickly and easily.

The **MediaBay** helps you to find and organize your content. After scanning your folders, all media files of the supported formats that have been found are listed in the **Results** section.

The first thing to do is to set up **Locations**, that is folders or directories on your system that contain media files. Usually, files are organized in a specific way on your computer. You might have folders reserved for audio content, folders for special effects, folders for combinations of sounds making up the ambience noise that you need for a certain film take, etc. These can all be set as different **Locations** in the **MediaBay**, allowing you to limit the files available in the **Results** list according to context.

Whenever you expand your computer system, you should save the new volumes as **Locations** or add them to your existing Locations.

By using the search and filter options, you can narrow down the results.

You can insert the files into your project by using drag & drop, by double-clicking, or by using the context menu options.

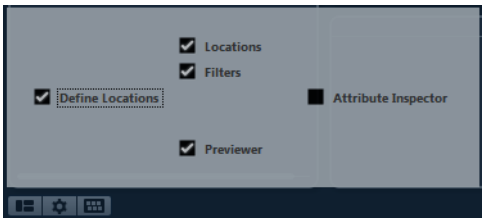
Setting Up the MediaBay

You can show and hide the different sections of the **MediaBay**. This saves screen space and enables you to display only the information that you need.

PROCEDURE

1. Click the **Set up Window Layout** button in the lower left corner of the **MediaBay**.

A transparent pane appears, containing checkboxes for the different sections.



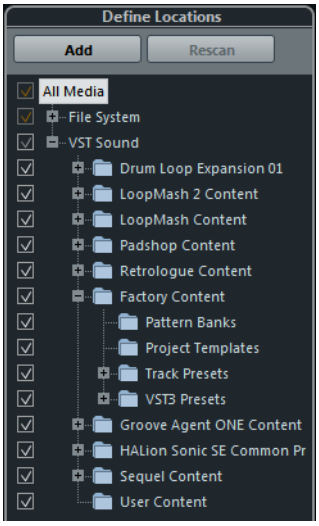
2. Deactivate the checkboxes for the sections that you want to hide.

   You can also use key commands for this: use the [Up]/[Down] and [Left]/[Right] arrow keys to step through the checkboxes and press [Space] to activate/deactivate the selected checkbox.

3. When you are done, click outside the pane to exit the setup mode.

Define Locations Section

In the **Define Locations** section, you can specify which folders or directories you want to include in the scan for media files. To do so, activate/deactivate the checkboxes for the folders.



The color of the checkmark helps you to identify which folders and subfolders are scanned:

- White indicates that all subfolders are scanned.
- Orange indicates that at least one subfolder is excluded from the scan.

  To revert to scanning a complete folder including all subfolders, click on an orange checkmark.

The scanning status for the individual folders is indicated by the color of the folder icons:

- Red indicates that the folder is currently being scanned.
- Light blue indicates that the folder has been scanned.

- Dark blue indicates that a folder is excluded from the scan.
- Orange indicates that the scanning process for the folder was interrupted.
- Yellow indicates that a folder has not yet been scanned.

VST Sound Node

The VST Sound node is a shortcut to your user content and the factory content files, including the preset folders.

The folders below the VST Sound node represent the directories in which content files and track presets, VST presets, etc. are stored by default.

Scanning Your Content

You can specify which folders or directories you want to include in the scan.

- To include a folder in the scan, activate its checkbox.
- To exclude a folder from the scan, deactivate its checkbox.
- To restrict the search to individual subfolders, activate/deactivate their checkboxes.

The scan result is saved in a database file. When you deactivate the checkbox for a folder that has already been scanned, a message appears, allowing you to keep the gathered scan data in this database file or to completely remove the data for this folder from the database file.

- To keep the database entries and exclude the folder from being scanned, select **Keep**.
- To remove the contents from the database, select **Remove**.

All files that are found in the specified folders are shown in the **Results** list.

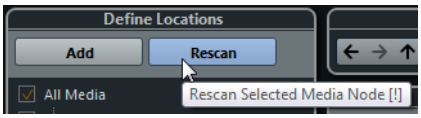
Updating the MediaBay

When you have made changes to the content of media folder or modified attributes, you must update the **MediaBay**. You can update the **MediaBay** by rescanning or by refreshing.

Rescanning

If you have made changes to the content of specific media folders and want those changes to be displayed in the **MediaBay** you must rescan them.

- To rescan the selected folder and its subfolders, click the **Rescan** button in the **Define Locations** section. You can also right-click a folder and select **Rescan Disk**.



- To rescan only the folders that have changed since the last scan, right-click in the **Define Locations** section, and select **Quick Rescan Disk**.

Refreshing

If you have modified attribute values or mapped a new network, you must refresh the corresponding folders.

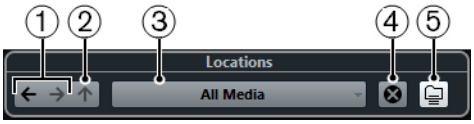
- To refresh a folder, in the **Define Locations** section of the **MediaBay** right-click a folder, and select **Refresh Views**.
- To display a new network drive, in the **Define Locations** section of the **MediaBay** right-click the parent node, and select **Refresh Views**. You can then scan the drive for media files.

RELATED LINKS

Editing Attributes (Tagging) on page 624

Locations Section

When you open the **Select Defined Browse Location** pop-up menu and select a location, the media files that are found in that location are shown in the **Results** list. By switching between the locations you defined, you can quickly browse to the files you are looking for.



1) **Previous/Next Browse Location**

   Selects the previous/next browse location.

2) **Browse Containing Folder**

   Opens the parent location of the selected folder.

3) **Select Defined Browse Location**

   The following location presets are available by default:

   All Media, Local Harddisks, VST Sound, Factory Content, User Content, Nuendo Projects, Documents, Desktop, Music.

4) **Remove Browse Location Definition**

Removes the selected browse location.

5) **Deep Results**

If this option is activated, the media files that are located in the subfolders of the selected location are also displayed in the results list.

Defining Locations

You can define locations, that is shortcuts to the folders that you want to work with. These are shown in the Locations section.

PREREQUISITE

Set up the Define Locations section and scan the content.

PROCEDURE

1. In the **Define Locations** section in the **MediaBay**, select the folder that you want to define as a location.
2. Click the **Add** button.
3. Accept the default name or enter a new name.
4. Click **OK**.

   The new location is added to the **Select Defined Browse Location** pop-up menu in the **Locations** section.
5. Repeat these steps to add as many locations as you want.

AFTER COMPLETING THIS TASK

Once you have set up your locations, you can hide the **Define Locations** section from view, to save screen space.

Browsing the Locations

You can quickly switch between different locations.

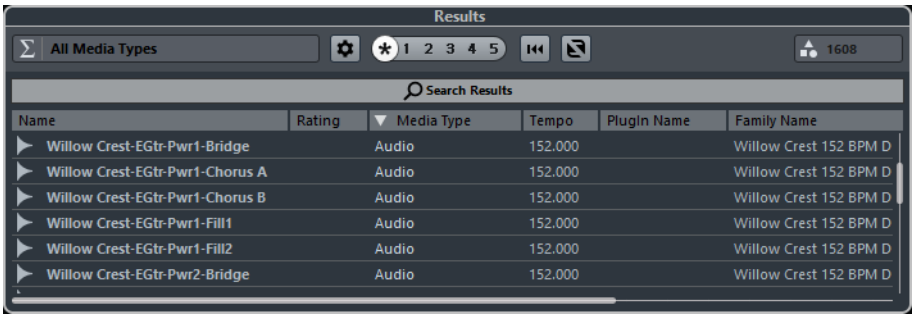
- To change the browse location, select another location from the **Select Defined Browse Location** pop-up menu.

  If the available locations do not include the files that you want to display or if the folder that you want to scan for files is not part of any of the locations, define a new location in the **Define Locations** section.
- To select the previous or next folder, click the **Previous/Next Browse Location** buttons. These paths are deleted when you close the **MediaBay**.
- To select the parent folder of the selected folder, click the **Browse Containing Folder** button.

- To remove a location from the pop-up menu, select it and click the **Remove Browse Location Definition** button.
- To show the files contained in the selected folder and any subfolders, activate the **Deep Results** button. When this button is deactivated, only the folders and files contained in the selected folder are shown.

Results Section

The **Results** list shows all media files that are found in the selected location.

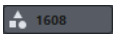


The info field in the top right corner of the **Results** section shows how many files were found with the current filter settings. As the number of files displayed can be huge, you can use any of the filter and search options in the **MediaBay** to narrow down the list.

To set the maximum number of files that are displayed in the Results list, specify a new value for **Maximum Items in Results List** in the **MediaBay Preferences**.

Search in Progress Indicator

An indicator to the right of the number of files found indicates that a media search is in progress.



Inserting Files into the Project

PROCEDURE

- To insert a file into your project, do one of the following:
  - Right-click the file and select one of the **Insert into Project** options.
  - Double-click the file.
  - Drag it into the project.

RESULT

Depending on the track type, the following happens:

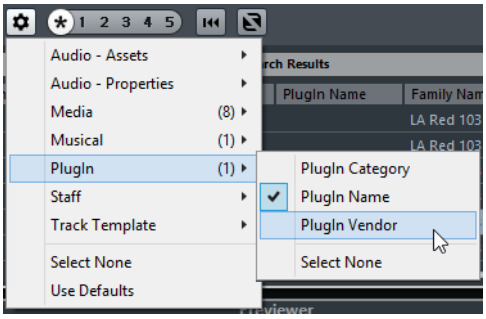
- Audio files, MIDI loops, and MIDI files are inserted on the active track if this matches the file type or onto a new track if no corresponding track is active. The files are inserted at the project cursor position.
- If you double-click a track preset it is applied to the active track if the track type matches the track preset. Otherwise, a new track is inserted, containing the settings of the track preset.
- If you double-click a VST preset, an instrument track is added to the project, containing an instance of the corresponding instrument. For some VST presets, this loads the entire instrument settings, programs, etc. For others, only one program is loaded.
- If you double-click a pattern bank (NEK only), a new MIDI track is created in the **Project** window, with an instance of the **Beat Designer** plug-in as insert effect which is using this pattern.

Setting Up the Results List Columns

For each media type, or for combinations of media types, you can specify the attribute columns that are displayed in the **Results** list.

PROCEDURE

1. In the Results section of the **MediaBay**, select the media types that you want to make settings for.
2. Click the **Set up Result Columns** button and activate or deactivate the options on the submenus.



To exclude a particular category, select **Select None** on the corresponding submenu.

If **Allow Editing in Results List** is activated in the **MediaBay Preferences** dialog, you can also edit attributes in the **Results** list. Otherwise, this is only possible in the **Attribute Inspector**.

Managing Media Files in the Results List

- To move or copy a file from the **Results** list to another location, drag it to another folder in the **Define Locations** section.

- To change the order of the columns in the **Results** list, click on a column header, and drag that header to another position.
- To delete a file, right-click it in the list and select **Delete**. The file is permanently deleted from your computer.

IMPORTANT

If you delete a file using the Windows Explorer/Mac OS Finder, it is still displayed in the **Results** list, although it is no longer available to the program. To remedy this, re-scan the corresponding folder.

Shuffling the Results List

You can display the **Result** list entries in a random order.

- To shuffle the **Results** list, click the **Shuffle Results** button in the **MediaBay**.

Finding the Location of a File

You can open the Windows Explorer/Mac OS Finder to show the location of a file on your system.

NOTE

This function is not available for files which are part of a VST Sound archive.

PROCEDURE

- In the Results list, right-click a file, and select **Show in Explorer** (Win)/**Reveal in Finder** (Mac).

RESULT

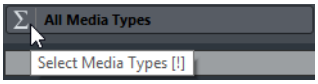
The Windows Explorer/Mac OS Finder opens and the corresponding file is highlighted.

Filtering According to Media Type

You can set up the **Results** list to display only a particular media type or a combination of media types.

PROCEDURE

1. In the **Results** section, click the **Select Media Types** button.

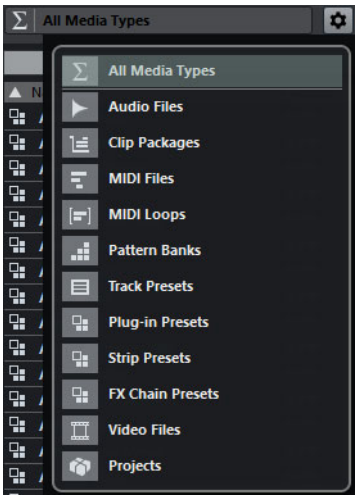


2. In the **Show Media Types** dialog, activate the media types that you want to be displayed in the **Results** list.

   When you have filtered the list to show a particular media type, this is indicated by the corresponding icon to the left of **Select Media Types** button. When you have selected several media types, the **Mixed Media Type** icon is used.

Show Media Types Selector

You can activate the media types that you want to be displayed in the **Results** list.



The following media types are available:

Audio Files

When this option is activated, the list shows all audio files. The supported formats are `.wav`, `.w64`, `.aiff`, `.aifc`, `.rex`, `.rx2`, `.mp3`, `.mp2`, `.ogg`, `.sd2` (Mac only), `.wma` (Win only).

Clip Packages

When this option is activated, the list shows all clip packages (file name extension `.package`). Clip packages contain a number of audio parts and events, which make up a special sound.

MIDI Files

When this option is activated, the list shows all MIDI files (file name extension `.mid`).

MIDI Loops

When this option is activated, the list shows all MIDI loops (file name extension `.midiloop`).

Pattern Banks (NEK only)

When this option is activated, the list shows all pattern banks (file name extension `.patternbank`). Pattern banks are generated via the MIDI plug-in **Beat Designer**. For more information, see the separate PDF document “Plug-in Reference”.

Track Presets

When this option is activated, the list shows all track presets for audio, MIDI, and instrument tracks (file name extension `.trackpreset`). Track presets are a combination of track settings, effects, and **MixConsole** settings that can be applied to new tracks of various types.

Plug-in Presets

When this option is activated, the list shows all VST presets for instrument and effect plug-ins. Furthermore, EQ presets that you save in the **MixConsole** are listed. These presets contain all parameter settings for a particular plug-in. They can be used to apply sounds to instrument tracks and effects to audio tracks.

Strip Presets

When this option is activated, the list shows all strip presets (file name extension `.strippreset`). These presets contain channel strip effect chains.

FX Chain Presets

When this option is activated, the list shows all effect chain presets (file name extension `.fxchainpreset`). These presets contain insert effect chains.

Video Files

When this option is activated, the list shows all video files.

Projects

When this option is activated, the list shows all project files (from Cubase, Nuendo, Sequel): `.cpr`, `.npr`, `.steinberg-project`.

RELATED LINKS

Clip packages on page 1217
Previewing Pattern Banks (NEK only) on page 616
Track Presets on page 167
Saving/Loading Strip Presets on page 401
Saving/Loading EQ Presets on page 391
Saving/Loading FX Chain Presets on page 388
Video File Compatibility on page 1100

Filtering According to Rating

With the **Rating Filter**, you can filter files according to their rating. This allows you to exclude files from the search according to their quality.

PROCEDURE

1. In the **Results** section of the **MediaBay**, drag the **Rating Filter** to the left or right.

2. To display all media files regardless of their rating, click the asterisk icon.

Performing a Text Search

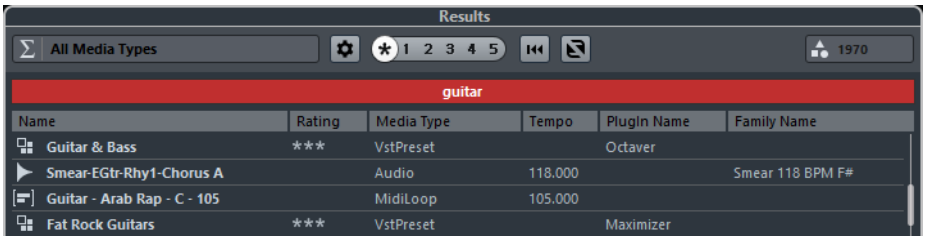
You can perform a text search in the **Results** list. If you enter text in the text search field, only media files whose attributes match the entered text are displayed.

The **Search Results** field has the same function as the **matches** operator of the logical filter. However, the search is applied to all file attributes.

- Click in the field and enter the text that you want to find.

  For example, if you are looking for all audio loops relating to drum sounds, enter “drum” in the search field. The search results contain loops with names, such as “Drums 01”, “Drumloop”, “Snare Drum”, etc. In addition, all media files with the **Drum&Percussion** category attribute or any other attribute that contains “drum” are found. You can also add apostrophes to find exact matches for the entered words and use boolean operators.

  When you enter text in the field, its background becomes red, to indicate that a text search is active for the list.



- To reset the text search, delete the text.

RELATED LINKS

Logical Filter on page 618

Boolean Text Search

You can perform advanced searches, using boolean operators or wildcards.

The following elements can be used:

And [+]

[a and b]

When entering strings separated by “and” (or a plus sign), all files are found that contain both a and b.

[And] is the default setting when no boolean operator is used, for example, you can also enter [a b].

Or [,]

[a or b]

When entering strings separated by “or” (or a comma), files are found that contain either a or b, or both.

Not [-]

[not b]

When entering text preceded by “not” (or a minus sign), all files not containing b will be found.

Parentheses [()]

[(a or b) + c]

Using parentheses, you can group text strings. In this example, files are found that contain c and either a or b.

Quotation marks [“ ”]

[“example text”]

With quotation marks, you can define sequences of several words. Files are found if they contain this sequence of words.

IMPORTANT

When you are searching for files whose name contains a hyphen, put the search text in quotation marks. Otherwise the program treats the hyphen as the boolean operator “not”.

NOTE

These operators can also be used for logical filtering.

RELATED LINKS

Applying a Logical Filter on page 619

Resetting the Results List

You can reset all filter settings and filter results.

- To reset the **Results** list, click the **Reset Result Filter** button in the **MediaBay**.

Previewer Section

You can preview individual files in the **Previewer** section to find out which one to use in your project.

The elements visible in this section and their functions depend on the media type.

IMPORTANT

The **Previewer** section is not available for video files, project files, and audio track presets. You can preview track presets in the **Presets** browser.

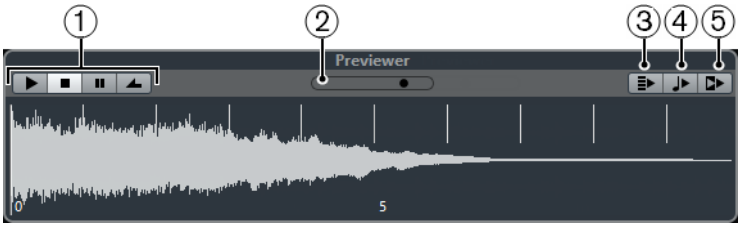
NOTE

Some **MediaBay**-specific preferences affect the playback of media files.

RELATED LINKS

MediaBay Preferences on page 630

Previewing Audio Files



1) **Transport Controls**

Let you start, stop, pause, and cycle the preview.

2) **Preview Level Fader**

Lets you specify the preview level.

3) **Auto Play New Results Selection**

If this option is activated, the selected file is automatically played back.

4) **Align Beats to Project**

If this option is activated, the selected file is played back in sync with the project, starting at the project cursor position. Note that this can apply realtime time stretching to your audio file.

NOTE

If you import an audio file into your project for which **Align Beats to Project** is activated in the **Previewer**, **Musical Mode** is automatically activated for the corresponding track.

5) **Wait for Project Play**

If this option is activated, the play and stop functions from the **Transport** panel are synchronized with the play and stop buttons in the **Previewer** section.

To use this option to its full extent, set the left locator at the beginning of a bar, then start playing back the project using the **Transport** panel. The loops that you now select in the **Results** list will start together with the project in perfect sync.

Using Selection Ranges

You can also specify selection ranges to only preview a particular section of an audio file and insert it into the project.

NOTE

Selection ranges cannot be used when the **Align Beats to Project** option is activated in the **Previewer**.

- To select a range, move the mouse over the upper part of the waveform, so that it turns into a pencil, click and drag.

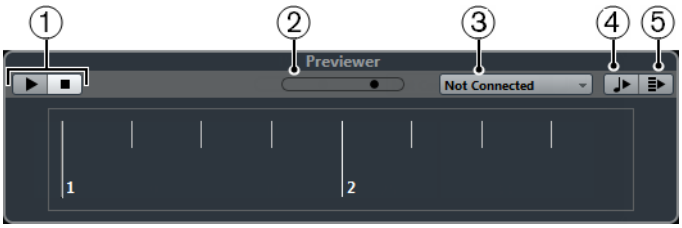
- To adjust the borders of the selection range, drag the handles.

- To deselect the range, drag both handles all the way to the left.

Previewing MIDI Files

IMPORTANT

To preview a MIDI file, you must select an output device from the **Output** pop-up menu.



1) **Transport Controls**
Let you start and stop the preview.

2) **Preview Level Fader**
Lets you specify the preview level.

3) **Output**
Lets you select the output device.

4) **Auto Play New Results Selection**
If this option is activated, the selected file is automatically played back.

5) **Align Beats to Project**

If this option is activated, the selected file is played back in sync with the project, starting at the project cursor position. Note that this can apply realtime time stretching to your MIDI file.

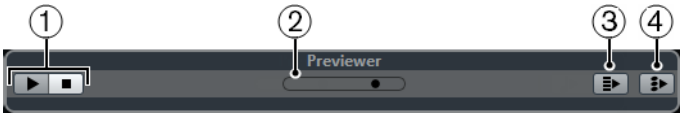
NOTE

If you import a MIDI file into your project for which **Align Beats to Project** is activated in the **Previewer**, **Musical Mode** is automatically activated for the corresponding track.

Previewing MIDI Loops

NOTE

MIDI loops are always played back in sync with the project.



1) **Transport Controls**

Let you start and stop the preview.

2) **Preview Level Fader**

Lets you specify the preview level.

3) **Auto Play New Results Selection**

If this option is activated, the selected file is automatically played back.

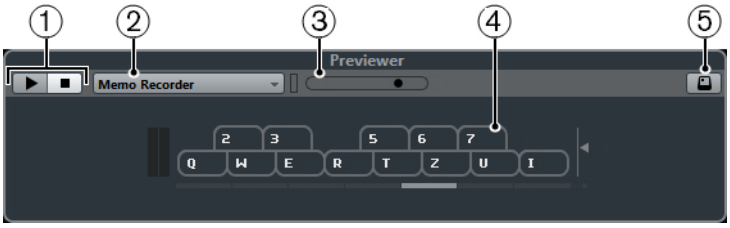
4) **Link Playback to Chord Track** (NEK only)

If this option is activated, the events of the MIDI loop are transposed to play back in context with the chord track. Note that you need a chord track with chord events for this.

If this option is activated, and you insert a MIDI loop into the project, **Follow Chord Track** is automatically activated for the track.

Previewing VST Presets and Track Presets for MIDI and Instrument Tracks

To preview track presets for MIDI or instrument tracks and VST presets you need some MIDI notes. These notes can be sent to the track preset via MIDI Input, using a MIDI file, the **Memo Recorder** mode, or via the computer keyboard.



Virtual keyboard in keyboard display mode.

1) **Transport Controls**

Let you start and stop the preview.

2) **Previewer Sequence Mode Menu**

Lets you load a MIDI file to apply the currently selected preset to the MIDI file. You can also select the **Memo Recorder** mode that continually repeats a given sequence of notes as a loop.

3) **Preview Level Fader**

Lets you specify the preview level.

4) **Virtual Keyboard**

You can display the virtual keyboard in the keyboard display mode or in the piano display mode.

5) **Computer Keyboard Input**

If this option is activated, you can use your computer keyboard to preview the presets.

RELATED LINKS

Previewing Presets Using the Memo Recorder Mode on page 615
Virtual Keyboard (NEK only) on page 237

Previewing Presets Via MIDI Input

MIDI input is always active, for example, when a MIDI keyboard is connected to your computer and set up properly, you can directly start playing the notes to preview the selected preset.

Previewing Presets Using a MIDI File

PROCEDURE

1. On the **Previewer Sequence Mode** pop-up menu, select **Load MIDI File**.
2. In the file dialog that opens, select a MIDI file and click **Open**.

   The name of the MIDI file is displayed on the pop-up menu.
3. Click the **Play** button to the left of the pop-up menu.

RESULT

The notes received from the MIDI file are played back with the settings of the track preset applied.

NOTE

The recently used MIDI files are kept on the menu, for quick access. To remove an entry from this list, select it on the menu and then select **Remove MIDI File**.

Previewing Presets Using the Memo Recorder Mode

The **Memo Recorder** mode continually repeats a given sequence of notes as a loop.

NOTE

You cannot use the **Memo Recorder** mode when previewing presets using a MIDI file.

PROCEDURE

1. On the **Previewer Sequence Mode** pop-up menu, select **Memo Recorder**.
2. Activate the **Play** button.
3. Play some notes on the MIDI keyboard or on the computer keyboard.

RESULT

The notes are played back with the preset settings applied.

When you stop playing notes and wait for 2 seconds, the note sequence that you played until this moment is played back in a continuous loop.

To use another sequence, start entering notes again.

Previewing Presets Via the Computer Keyboard

NOTE

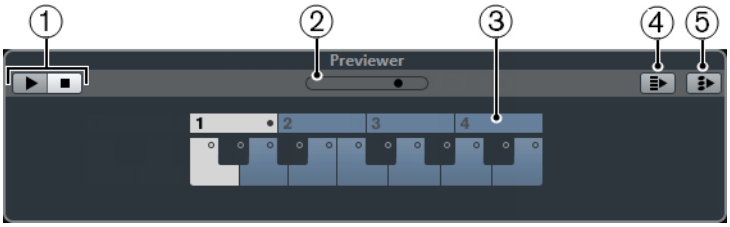
If you activate the **Computer-Keyboard Input** button, the computer keyboard is used exclusively for the **Previewer** section. However, you can still use the following key commands: [Ctrl]/[Command]-[S] (Save), Num [*] (Start/Stop Record), [Space] (Start/Stop Playback), Num [1] (Jump to left locator), [Delete] or [Backspace], Num [/] (Cycle on/off), and [F2] (Show/Hide Transport panel).

PROCEDURE

1. Activate the **Computer-Keyboard Input** button.
2. Play some notes on the computer keyboard.

Previewing Pattern Banks (NEK only)

Pattern banks containing drum patterns can be created with the MIDI plug-in **Beat Designer**.



1) **Transport Controls**

   Let you start and stop the preview.

2) **Preview Level Fader**

   Lets you specify the preview level.

3) **Keyboard**

   The keyboard allows you to preview the selected pattern bank. In the **Previewer** section, choose a subbank (the number at the top) and pattern (a key), and click the **Play** button.

   One pattern bank contains 4 subbanks which in turn contain 12 patterns each.

   Subbanks can contain empty patterns. Selecting an empty pattern in the **Previewer** section has no effect. Patterns containing data are indicated by a circle in the upper part of the key in the display.

4) **Auto Play New Results Selection**

   If this option is activated, the selected file is automatically played back.

5) **Link Playback to Chord Track**

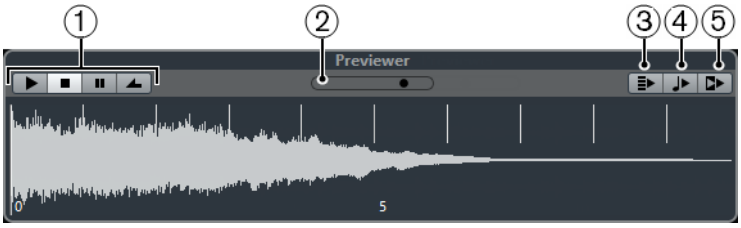
   If this option is activated, the events of the MIDI loop are transposed to play back in context with the chord track. Note that you need a chord track with chord events for this.

   If this option is activated, and you insert a MIDI loop into the project, **Follow Chord Track** is automatically activated for the track.

NOTE

Detailed information on the **Beat Designer** and its functions can be found in the separate PDF document Plug-in Reference in the chapter MIDI effects.

Previewing Clip Packages



1) **Transport Controls**

Let you start, stop, pause, and cycle the preview.

2) **Preview Level Fader**

Lets you specify the preview level.

3) **Auto Play New Results Selection**

If this option is activated, any file that you select in the **Results** list is automatically played back.

4) **Align Beats to Project**

If this option is activated, the selected file is played back in sync with the project, starting at the project cursor position. Note that this can apply realtime time stretching to your audio file.

NOTE

If you import an audio file into your project for which **Align Beats to Project** is activated in the **Previewer**, **Musical Mode** is automatically activated for the corresponding track.

5) **Wait for Project Play**

If this option is activated, the play and stop functions from the **Transport** panel are synchronized with the play and stop buttons in the **Previewer** section.

To use this option to its full extent, set the left locator at the beginning of a bar, then start playing back the project using the **Transport** panel. The loops that you now select in the **Results** list will start together with the project in perfect sync.

RELATED LINKS

Clip packages on page 1217

Filters Section

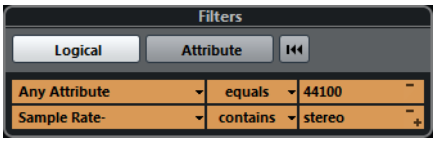
With the **MediaBay**, you can perform very refined file searches. You have two possibilities: **Logical** or **Attribute** filtering. You can also save your filter settings in a MediaBay Aspect, which allows for a quick recall of particular searches.

RELATED LINKS

MediaBay Aspects on page 629

Logical Filter

The logical filter allows you to set up complex search conditions that must be met to find files.



contains

The search result must contain the text or number specified in the text field to the right.

matches words

The search result must match the words specified in the text field to the right.

omits

The search result must not contain the text or number specified in the text field to the right.

equals

The search result must correspond exactly to the text or number specified in the text field to the right, including any file extension. Text searches are not case-sensitive.

>=

The search result must be higher than or equal to the number specified in the field to the right.

<=

The search result must be lower than or equal to the number specified in the field to the right.

is empty

Use this option to find files for which certain attributes have not been specified yet.

matches

The search result must include the text or number entered in the text field to the right. You can also use boolean operators. Add apostrophes to find exact matches for the entered words, for example ‘drum’ AND ‘funky’. This option allows for a very advanced text search.

in range

If this option is selected, you can specify a lower and an upper limit for the search result in the fields to the right.

Applying a Logical Filter

To quickly find certain audio files, you can search for a specific file attribute value, for example.

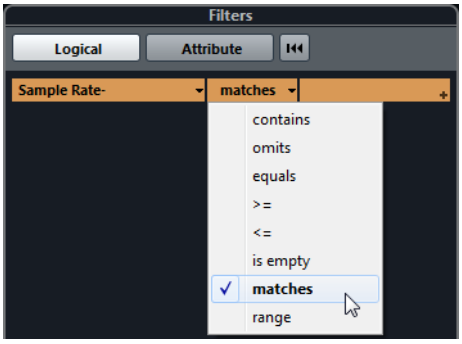
PREREQUISITE

In the **Locations** section, select the location in which you want to search for files.

PROCEDURE

1. In the **Filters** section, activate the **Logical** button.
2. Click in the leftmost field, to open the **Select Filter Attributes** dialog.
3. Select the attributes that you want to use.

   If you select more than one attribute, the files found match either one or the other attribute.
4. Click **OK**.
5. On the condition pop-up menu, select one of the search operators.



6. Enter the text or number that you want to find in the field to the right.

   NOTE

   If you enter 2 or more strings or filter lines, the files that are found match all strings or filter lines.

   - To add more than one string in the text field, enter a [Space] between them.
   - To add another filter line, click the **+** button to the right of the text field. You can add up to seven filter lines in which you can define further search conditions.

- To remove a filter line, click the corresponding **-** button.
- To reset all search fields to their default settings, click the **Reset Filter** button in the top right corner of the **Filters** section.

RESULT

The **Results** list is automatically updated, showing only the files that correspond to your search conditions.

Advanced Text Search

You can perform very advanced text searches using boolean operators.

PREREQUISITE

In the **Locations** section, select the location in which you want to search for files.

PROCEDURE

1. In the **Filters** section, activate the **Logical** button.
2. Select an attribute on the **Select Filter Attributes** pop-up menu or leave the setting on **Any Attribute**.
3. Set the condition to **matches**.
4. Specify the text that you want to search for in the field to the right using boolean operators.

RELATED LINKS

Performing a Text Search on page 609

About Attributes for Media Files

Attributes for media files are sets of meta data providing additional information on the file.

The different types of media files have different attributes. For example, `.wav` audio files have attributes like name, length, size, sample rate, etc., while `.mp3` files have additional attributes such as artist or genre. In postproduction contexts, you would use attributes like actor's text, episode, pull factor, etc.

RELATED LINKS

Attribute Inspector on page 622

Attribute Filter

Assigning attribute values to your files makes it easy to organize the media files. With the **Attribute** filter, you can view and edit some of the standard file attributes found in your media files.

If you click the **Attribute** button, the **Filters** section displays all values found for a specific attribute. Selecting one of these values displays a list of files that contain this attribute value.

1) **Attribute columns**

Let you select different attribute categories. If the columns are wide enough, the number of files that match this criteria is displayed to the right of the filter name.

2) **Attribute values**

Displays the attribute values and how often a certain attribute value is available among your media files.

NOTE

- Some attributes are directly linked to each other. For example, for each category value, there are certain sub category values available. Changing the value in one of these attribute columns displays different values in the other column.
- Each attribute column displays only the attribute values found in the currently selected location.

RELATED LINKS

Attribute Inspector on page 622

Applying an Attribute Filter

With the **Attribute** filter you can quickly find audio files with certain attributes.

- To apply an **Attribute** filter, click on an attribute value.

  The **Results** list is filtered accordingly. Apply more attribute filters to restrict the result even more.

- To find files that match either one or the other attribute, [Ctrl]/[Command]-click different attribute values in the same column.
- To change the displayed attribute values of a column, click on the attribute column and select another attribute.

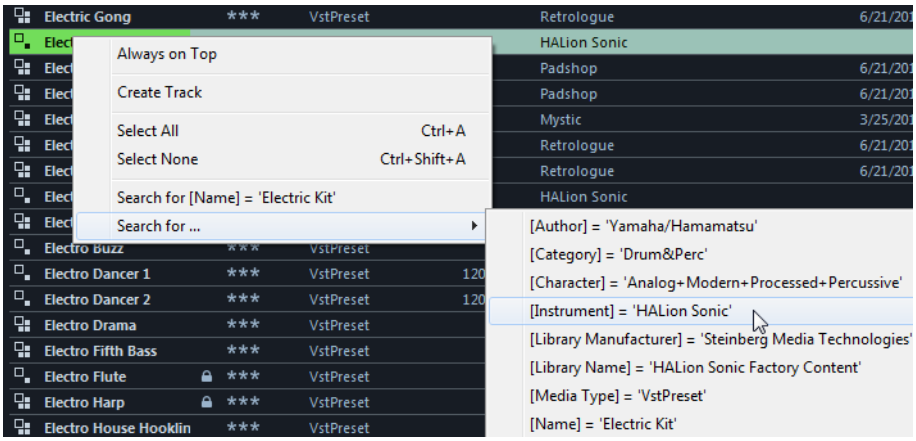
NOTE

Character attributes always form an AND condition.

Performing a Context Menu Search

You can search for other files with the same attribute as the selected. This way you can easily find all the files that have a value in common, for example, if you want to view all files that were created on the same day.

- In the **Results** list or the **Attribute Inspector**, right-click a file, and select the attribute value that you want to search for from the **Search for** submenu.



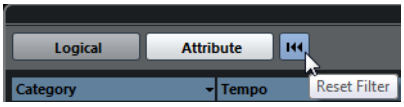
The **Filters** section automatically switches to **Logical** filtering and the corresponding filter condition line is displayed.

- To reset the filter, click the **Reset Result Filters** button.

Resetting the Filter

PROCEDURE

- To reset the filter, click the **Reset Filter** button at the top of the **Filters** section.



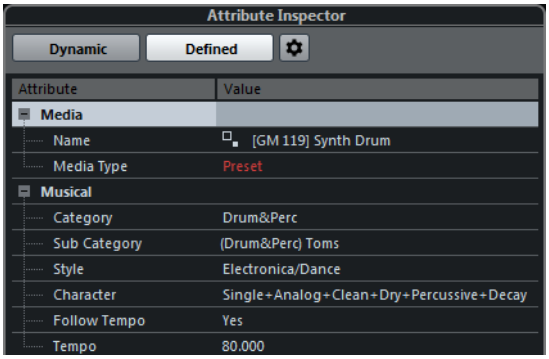
This also resets the **Results** list.

Attribute Inspector

When you have selected one or more files in the **Results** list, the **Attribute Inspector** shows a list of attributes and their values.

In the **Attribute Inspector**, you can also edit and add new attribute values.

The available attributes are divided into several groups (Media, Musical, Preset, etc.), so as to keep the list manageable and make it easy to find an element quickly.



Dynamic

Displays all available values for the selected files.

Defined

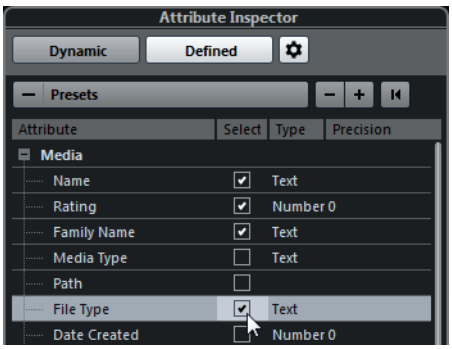
Displays a configured set of attributes for the selected media type regardless of whether corresponding values are available for the selected files.

Configure Defined Attributes

Activates the configuration mode in which you can set up the attributes are that are displayed in the **Attribute Inspector**.

Configuration Mode

When you click the **Configure Defined Attributes** button, the configuration mode is enabled.



Select Media Types

Lets you select one or several media types. You can then manage which attributes are displayed in the **Attribute Inspector** for the selected media types.

+/-

Opens the **Add User Attribute** dialog, where you can add or remove custom user attributes. You can select the **Attribute Type** and the **Display Name**.

Reset to Default

Resets the attribute list to the default settings.

Attribute

Shows the attribute name.

Select

Shows whether an attribute is activated or deactivated.

Type

Shows whether the value for an attribute is a number, text, or a Yes/No switch.

Precision

Shows the number of decimals displayed for number attributes.

RELATED LINKS

About Attributes for Media Files on page 620
Managing Attribute Lists on page 627

Color Schemes in the Attribute Inspector

The color of an attribute value indicates if and in which form you can edit an attribute.

White

One or more files are selected in the **Results** list, and they have the same values.

Yellow

Multiple files are selected in the **Results** list, and their values differ.

Orange

Multiple files are selected in the **Results** list, with differing values, and which cannot be edited.

Red

One or more files are selected in the **Results** list, whose values cannot be edited.

Information on the meaning of the colors used in the **Attribute Inspector** are also displayed in a tooltip when you move the mouse pointer over one of the color icons below the **Attribute Inspector**.

Editing Attributes (Tagging)

The search functions, especially the attribute filter, are a powerful media management tool when making extensive use of tagging, for example, when adding and editing attributes.

Media files are usually organized in complex folder structures to provide a logical way of guiding the user to certain files, with the folder and/or file names indicating the sound, recording location, etc.

Tags help you finding a particular sound or loop in such a folder structure.

Editing Attributes in the Attribute Inspector

In the **Attribute Inspector**, you can edit attribute values of the various media files. Attribute values can be chosen from pop-up lists, entered as text or numbers, or set to Yes or No.

NOTE

- Changing an attribute value in the **Attribute Inspector** permanently changes the corresponding file unless the file is write-protected or part of a VST Sound archive.
- Some attributes cannot be edited. If this is the case, the file format probably does not permit changing this value, or changing a particular value makes no sense. For example, you cannot change the file size in the **MediaBay**.

PROCEDURE

1. In the **Results** list, select the file that you want to make settings for.

   The corresponding attribute values are displayed in the **Attribute Inspector**.

   You can also select several files and make settings for them simultaneously. The only exception is the name attribute, which must be unique for every file.

2. In the **Attribute Inspector**, click in the **Value** column for an attribute.

   Depending on the selected attribute, the following happens:

   - For most of the attributes, a pop-up menu opens from which you can choose a value. This can be a name, a number and an on/off state. Some of the pop-up menus also have a “more…” entry to open a window with more attribute values.
   - For the **Rating** attribute, you can click in the **Value** column and drag left or right to modify the setting.
   - For the **Character** attribute (Musical group), the **Edit Character** dialog opens. Click a radio button on the left or the right side and then click **OK** to define values for the **Character** attribute.

3. Set the attribute value.

   To remove the attribute value from the selected files, right-click in the corresponding `Value` column and select **Remove Attribute** from the context menu.

Editing Attributes in the Results List

You can edit attributes directly in the **Results** list. This allows you to assign tags to a number of loop files, for example.

PREREQUISITE

Allow Editing in Results List must be activated in the **MediaBay Preferences**.

PROCEDURE

1. In the **Results** list, select the files that you want to make settings for.

   You can make settings for several files simultaneously. The only exception is the name attribute, which must be unique for every file.

2. Click in the column for the value that you want to change and make the settings.

RELATED LINKS

MediaBay Preferences on page 630

Editing Attributes of Multiple Files Simultaneously

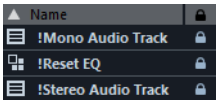
You can tag multiple files at the same time. There is no limit as to how many files can be tagged at the same time, but the tagging of a large amount of files in one go can take a while.

The tagging operation is executed in the background, so that you can continue with your work as usual. By looking at the **Attribute Counter** above the **Results** list, you can see how many files still have to be updated.

Editing Attributes of Write-Protected Files

Media files can be write-protected due to a number of reasons. The content can be provided by someone who write-protected the files, the file format could restrict write operations by the **MediaBay**, etc..

In the **MediaBay**, the write protection status of files is shown as an attribute in the **Attribute Inspector** and in the **Write Protection** column in the **Results** list.



IMPORTANT

You can define attribute values of write-protected files in the **MediaBay**. These changes are not written to disk though and occur in the **MediaBay** only.

NOTE

If the **Write Protection** and/or the **Pending Tags** columns are not visible, activate the corresponding attributes for the file type in the **Attribute Inspector**.

- To set or remove the write protection attribute for a file, right-click the file in the **Results** list and select **Set/Remove Write Protection**.

  This is only possible if the file type allows write operations and you have the necessary operation system permission.

- When you specify attribute values for a file that is write-protected, this is reflected in the **Pending Tags** column next to the **Write Protection** column in the **Results** list.

  If you rescan the **MediaBay** content and a media file on your hard disk has changed since the last scan, the pending tags for this file will be lost.

- If a file has pending tags, and you want to write the corresponding attributes to the file, you must remove the write protection, then right-click the file, and select **Write Tags to File**.

NOTE

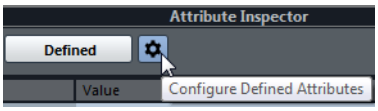
If you use other programs than Nuendo to change the write-protection status of a file, you must rescan the files in the **MediaBay** to reflect these changes.

Managing Attribute Lists

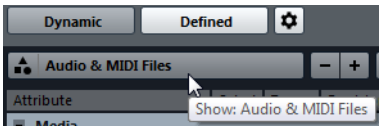
In the **Attribute Inspector**, you can define which attributes are displayed in the **Results** list and in the **Attribute Inspector** itself. For different media types, individual attribute sets can be configured.

PROCEDURE

1. In the **Attribute Inspector**, click the **Defined** button.
2. Click the **Configure Defined Attributes** button to enter configuration mode.



3. Open the **Show** pop-up menu, activate the media types that you want to display, and click anywhere in the **MediaBay**.



The **Attribute Inspector** now shows a list of all attributes available for these media types.

- If you have activated more than one media type, your settings affect all selected types. An orange checkmark indicates that the current display settings for an attribute differ for the selected media types.
- The display settings made for the **Mixed Media Types** option are applied if you select files of different media types in the **Results** list or the **Attribute Inspector**.

4. Activate the attributes that you want to be displayed.

   You can edit several attributes in one go.

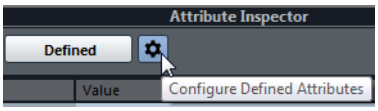
5. Click the **Configure Defined Attributes** button again to exit the configuration mode.

Defining User Attributes

You can define your own attributes and save these in the **MediaBay** database and the corresponding media files. Nuendo recognizes all user attributes that are included in media files.

PROCEDURE

1. In the **Attribute Inspector**, activate the **Defined** button.
2. Click the **Configure Defined Attributes** button to enter configuration mode.



3. Click the **+** button.
4. In the **Add User Attribute** dialog, specify the **Attribute Type** and the **Display Name**.

   The display name must be unique in the attribute list. The **Database Name** field indicates if a certain name is valid or not.

5. Click **OK**.

RESULT

The new attribute is added to the list of available attributes and is displayed in the **Attribute Inspector** and the **Results** list.

Loop Browser, Sound Browser, and Mini Browser

The **Loop Browser**, **Sound Browser**, and **Mini Browser** show different views of the **MediaBay**.

The **Loop Browser** lets you quickly browse your loops, for example, audio files, pattern banks (NEK only), and MIDI loops.

The **Sound Browser** lets you quickly search sounds. By default, it is set to display track presets and plug-in presets.

The **Mini Browser** is perfect to be placed along instruments like LoopMash or Groove Agent One.

These browser windows offer the same functions as the **MediaBay**, for example, you can specify different browse locations, define searches, set up the available panes, etc.

MediaBay Aspects

You can create configurations of the **MediaBay** window and save them as aspects. These can be recalled via the **Media** menu.

This is helpful if you only want to work with certain sound effect files that reside in a particular location, for example. Every item in the **MediaBay** that can be configured can be part of a **MediaBay** aspect. You can specify which sections are visible, which media types are browsed for, which locations are being scanned, and so on. You can also enter a search string and save it with the aspect.

Creating a New Aspect

PROCEDURE

1. Select **Media > MediaBay Aspects > New Aspect**.
2. In the **Add MediaBay Aspect** dialog, enter the name for the new aspect and click **OK**.

   The new **MediaBay** aspect window opens.
3. Configure the **MediaBay** window to your liking.

RESULT

The **MediaBay** aspect is automatically saved when you close the window or the program. Once the aspect is created, you can access it via the **Media** menu.

Creating a New Aspect Based on an Existing Aspect

To create a **MediaBay** aspect that differs only slightly from an existing aspect, you can base the new aspect on this existing aspect.

PROCEDURE

1. Select **Media > MediaBay Aspects > Duplicate Aspect** and select the aspect that you want to duplicate.
2. In the **Add MediaBay Aspect** dialog, enter the name for the new aspect and click **OK**.

   The new **MediaBay** aspect window opens.
3. Configure the **MediaBay** window to your liking.

RESULT

The **MediaBay** aspect is automatically saved when you close the window or the program. Once the aspect is created, you can access it via the **Media** menu.

Removing MediaBay Aspects

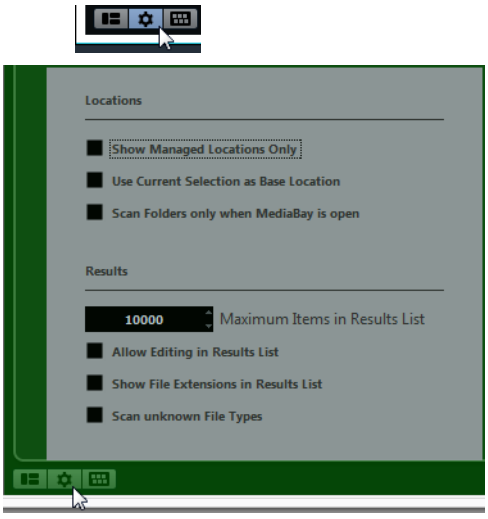
PROCEDURE

- Select **Media > MediaBay Aspects > Remove Aspect**.

MediaBay Preferences

The **Preferences** dialog in Nuendo contains a special **MediaBay** page where you can set up the **MediaBay**. These settings are also available from within the **MediaBay**.

- To display the preferences, click the **MediaBay Preferences** button in the lower left corner of the **MediaBay**.



Show Managed Locations Only

If this option is activated, all folders that are not scanned for files are hidden. This keeps the tree view in the Define Locations section less cluttered.

Use Current Selection as Base Location

If this option is activated, only the selected folder and its subfolders are shown.

Scan Folders only when MediaBay is open

If this option is activated, Nuendo only scans for media files when the **MediaBay** window is open.

If this is deactivated, the folders are scanned in the background even when the **MediaBay** window is closed. However, Nuendo never scans folders while playing back or recording.

Maximum Items in Results List

Specifies the maximum number of files that are displayed in the **Results** list. This avoids unmanageably long lists of files.

NOTE

The **MediaBay** does not warn you if the maximum number of files has been reached. There might be situations where a certain file you are looking for cannot be found because the maximum number of files was reached.

Allow Editing in Results List

If this option is activated, you can edit attributes in the **Results** list. If this option is deactivated, attributes can only be edited in the **Attribute Inspector**.

Show File Extensions in Results List

If this option is activated, file name extensions are displayed in the **Results** list.

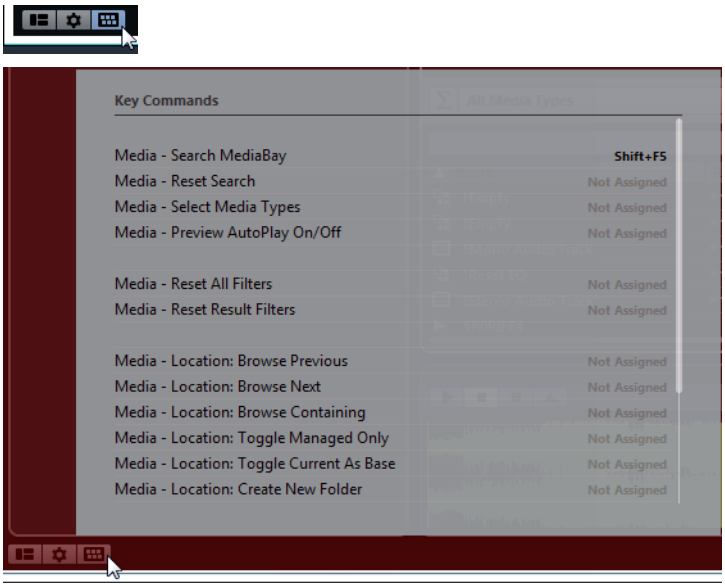
Scan unknown File Types

When scanning for media files, the **MediaBay** ignores files with an unknown file extension. If this option is activated, the **MediaBay** tries to open and scan any file in the search location and ignores those files that cannot be recognized.

MediaBay Key Commands

You can display the available **MediaBay** key commands from within the **MediaBay** window. This is useful if you want to get a quick overview over the assigned and the available **MediaBay** key commands.

- To open the key commands pane, click the **Key Commands** button in the lower left corner of the **MediaBay**.



- To close the key commands pane, click anywhere outside of the pane.

- To assign or modify a key command, click the corresponding key command.

RELATED LINKS

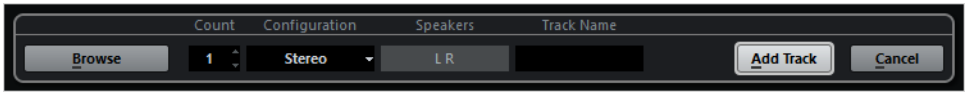
Key Commands on page 1168

Working with MediaBay-Related Windows

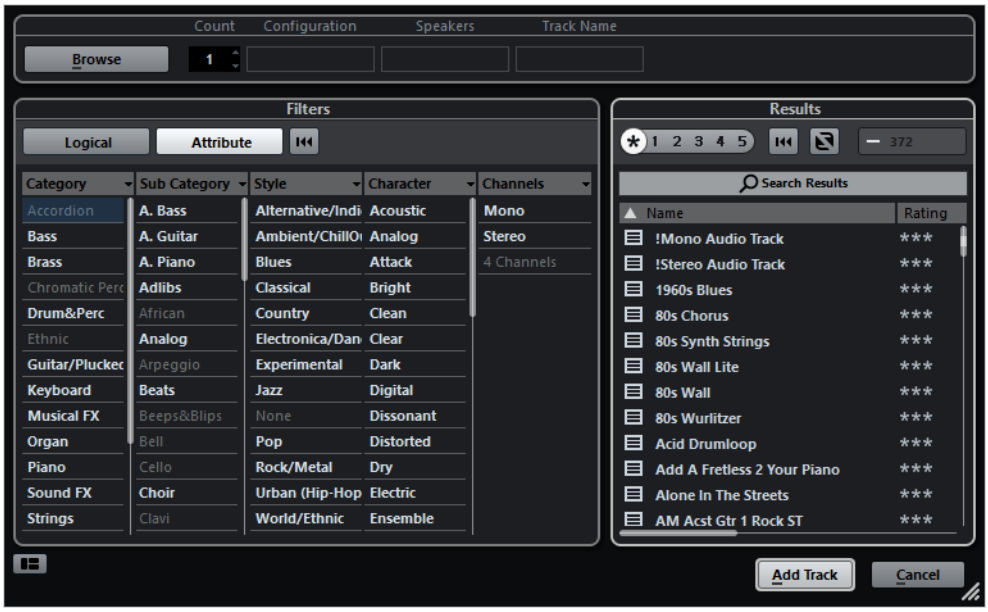
The **MediaBay** concept can be found throughout the program, for example, when adding new tracks or when choosing presets for VST instruments or effects. The workflow in all **MediaBay**-related windows is the same as in the **MediaBay**.

Adding Tracks

If you add a track by selecting **Project > Add Track**, the following dialog opens:



Click the **Browse** button to expand the dialog to show the **Results** list. Only file types that can be used in this context are shown.

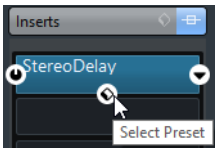


Applying Effect Presets

If you have added an insert effect to a track, you can choose from a variety of presets via the **Results** browser for the effect slot.

PROCEDURE

1. In the **Inserts** tab of the **Inspector**, click the **Select Preset** icon below the preset name.



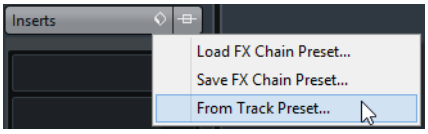
2. In the **Results** browser, double-click a preset to apply it.

Applying Track Presets

You can choose from a variety of track presets.

PROCEDURE

1. In the **Inspector**, click the **Preset Management** icon on the right of the **Inserts** tab.



2. Select **From Track Preset**.
3. In the **Results** browser, double-click a track preset to apply it.

RELATED LINKS

Track Presets on page 167

Applying Instrument Presets

When working with VST instruments, you can choose from a variety of presets via the **Results** browser.

PROCEDURE

1. In the track list, right-click the instrument track and select **Load Track Preset**.
2. In the **Results** browser, double-click a preset to apply it.

Instrument Presets Results Browser

The **Results** browser for instrument track presets lets you preview VST presets and apply them to your instrument track.

To open the **Results** browser, right-click an instrument track, and select **Load Track Preset**.

VST presets for instruments can be divided into the following groups:

Presets

Presets contain the settings of the entire plug-in. For multi-timbral instruments, this means the settings for all sound slots as well as the global settings.

Programs

Programs contain only the settings for one program. For multi-timbral instruments, this means only the settings for one sound slot.

Working With Volume Databases

Nuendo stores all media file information used in the **MediaBay**, such as paths and attributes, in a local database file on your computer. However, in some cases, it might be necessary to browse and manage this kind of metadata on an external volume.

For example, a sound editor might have to work both at home and in a studio, on two different computers. Therefore, the sound effects are stored on an external storage medium. To be able to connect the external device and directly browse its contents in the **MediaBay** without having to scan the device, you have to create a volume database for the external device.

Volume databases can be created for drives of your computer or for external storage media. They contain the same kind of information about the media files on these drives as the regular **MediaBay** database.

NOTE

When you launch Nuendo, all available volume databases are automatically mounted. Databases that are made available while the program is running have to be mounted manually.

Rescanning and Refreshing Volume Databases

If you have modified the scan settings on a different system, you must rescan or refresh the **MediaBay**.

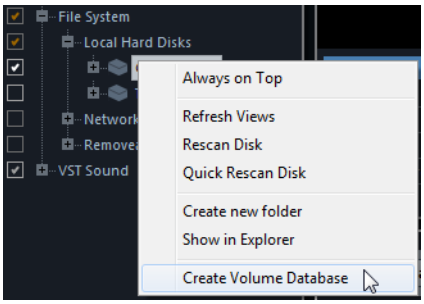
RELATED LINKS

Updating the MediaBay on page 601

Creating a Volume Database

PROCEDURE

- In the **Define Locations** section, right-click the external storage medium, drive, or partition of your computer system that you want to create a database for, and select **Create Volume Database**.

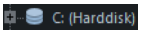


IMPORTANT

You must select the topmost level (root) for this. You cannot create a database file for a lower-level folder.

RESULT

The file information for this drive is written into a new database file. When the new database file is available, this is reflected by the symbol to the left of the drive name.



NOTE

If the drive contains a large amount of data, this process may take a while.

Volume databases are automatically mounted when Nuendo is launched. They are shown in the **Define Locations** section and their data can be viewed and edited in the **Results** list.

Removing a Volume Database

If you have worked on another computer using an external hard disk and return to your own computer and connect the external device again as part of your system setup, you do not need a separate volume database for it any more. Any data on this drive can then be included in the local database file again, by removing the extra database file.

PROCEDURE

- In the **Define Locations** section, right-click the volume database and select **Remove Volume Database**.

RESULT

The metadata is integrated in the local **MediaBay** database file and the volume database file is deleted.

NOTE

If the drive contains a large amount of data, this process may take a while.

Mounting and Unmounting Volume Databases

Volume databases that are made available while Nuendo is running must be mounted manually.

- To mount a volume database manually, right-click the external storage medium, drive, or partition of your computer system that you want to mount and select **Mount Volume Database**.
- To unmount a volume database, right-click it and select **Unmount Volume Database**.

Surround Sound

Nuendo has integrated surround sound features with support for several formats. This support goes all the way through the audio path: all audio-related channels (i.e. audio and instrument tracks as well as group channels) and busses can handle multi-channel speaker configurations. A channel in the MixConsole can either carry complete surround mixes, or an individual speaker channel which is part of a surround setup.

Nuendo offers the following surround-related features:

- Audio-related tracks can be routed freely to surround channels.
- The SurroundPanner V5 plug-in is automatically applied to audio-related tracks with a supported surround configuration and to output channels with a multi-channel configuration (other than stereo). It is available in the Inspector and MixConsole and can be used to graphically position channels in the surround field.
- The Anymix Pro plug-in can be used as an alternative to the default surround panner, the SurroundPanner V5. To switch the panner, right-click the panner in the MixConsole and select “Anymix Pro”. The plug-in is described in detail in the separate PDF document “Plug-In Reference”.
- The MixConvert V6 plug-in is used to convert a surround channel into a different format if the corresponding input/output configuration is not handled by the SurroundPanner V5. Nuendo places MixConvert V6 automatically where needed. Furthermore, the plug-in is described in detail in the separate PDF document “Plug-In Reference”.
- Nuendo supports surround-specific plug-ins, that is, plug-ins with multi-channel support specifically designed for surround sound mixing tasks (the included “Mix6to2” plug-in is an example of this). Furthermore, any VST 3 plug-in features multi-channel support and can therefore be used in a surround configuration, even if it was not specifically designed for surround. All plug-ins are described in the separate PDF document “Plug-in Reference”.
- You configure Nuendo for surround sound by defining input and output busses in the desired surround format and specifying which audio inputs and outputs are used for the different channels in the busses.

RELATED LINKS

Using the SurroundPanner V5 on page 642
Using the MixConvert V6 plug-in on page 656
Preparations on page 640
Effects in Multi-Channel Configurations on page 444

Deliverables

The result of a surround mix in Nuendo is either the multi-channel audio sent from the surround output bus to your dubber, or (if you use the Export Audio Mixdown feature) audio file(s) on your hard disk. Exported surround mixes can either be split (one mono file per speaker channel) or interleaved (a single file containing all the surround channels).

Available surround configurations

The following surround configurations are supported in Nuendo:

LRCS

LRCS refers to Left Right Center Surround, where the surround speaker is center-rear positioned. This is the original surround format that first appeared as Dolby Stereo in cinema and later as the home cinema format Dolby ProLogic.

5.0

This is the same as 5.1 (see below) but without the LFE channel. The LFE channel is optional in 5.1 and if you do not plan to use it, you might find this option more convenient.

5.1

This format is one of the most popular in cinema and DVD. In its various cinema and DVD encoding implementations (established by different manufacturers) it is referred to as Dolby Digital, AC-3, DTS and MPEG 2 Multichannel. 5.1 has one center speaker (mainly used for speech) and four surround speakers (for music and sound effects). Additionally a subchannel (LFE – Low Frequency Effects) with lower bandwidth is used for special low frequency effects.

LRC

Same as LRCS, but without the surround speaker channel.

LRS

Left-Right-Surround, with the surround speaker positioned at center-rear.

LRC+LFE

Same as LRC but with an LFE subchannel added.

LRS+LFE

Same as LRS but with an LFE subchannel added.

Quadro

The original Quadraphonic format for music, with one speaker in each corner. This format was intended for vinyl record players.

LRCS+LFE

Same as LRCS but with an LFE subchannel added.

Quadro+LFE

Same as Quadro but with an LFE subchannel added.

6.0 Cine

A Left-Right-Center front speaker arrangement with 3 (Left-Right-Center) surround channels.

6.0 Music

This uses 2 (Left/Right) front channels with Left and Right surround channels and Left and Right Side channels.

6.1 Cine

Same as 6.0 Cine but with an LFE subchannel added. This speaker arrangement is used in the Dolby Digital EX and DTS-ES formats.

6.1 Music

Same as 6.0 Music, but including an LFE subchannel.

7.0 Cine

A Left, Left of Center, Center, Right of Center, Right front speaker arrangement with Left and Right Surround channels.

7.0 Music

Same as 6.0 Music, but including a Center front channel.

7.1 Cine

Same as 7.0 Cine but with an LFE subchannel added. This arrangement is used in the Sony Dynamic Digital Sound (SDDS) format.

7.1 Music

Same as 7.0 Music, but including an LFE subchannel.

7.1 Proximity

A Left, Center, Right, speaker arrangement with Left and Right surround channels, a LFE subchannel and additional Proximity Left and Right channels. For further information about the Proximity format, refer to the chapter “Anymix Pro” in the separate PDF document “Plug-in Reference”.

8.0 Cine

Same as 7.0 Cine, but including a Center Surround channel.

8.0 Music

Same as 7.0 Music, but including a Center Surround channel.

8.1 Cine

Same as 8.0 Cine, but including an LFE subchannel.

8.1 Music

Same as 8.0 Music, but including an LFE subchannel.

10.2

This is an experimental format with ten surrounding speakers and two LFE channels (a combination of two 5.1 setups, one at the top and one at the bottom of the room). This option is available from the **3D** submenu.

Auro 9.0 to 13.1

The Auro formats are innovative surround formats, in which the channels are arranged on two levels, thereby creating a three-dimensional effect. The Auro formats are available with and without LFE subchannels. These options are available from the **3D** submenu.

Preparations

Output bus configuration

Before you can start working with surround sound, you have to configure a surround output bus, through which all the speaker channels of the selected surround format are routed.

RELATED LINKS

Adding Input and Output Busses on page 30

Child busses

A child bus is a bus within a (wider) bus. The most obvious application of a child bus is to create stereo busses within your surround bus – this allows you to route stereo tracks directly to a stereo speaker pair within the surround bus. You may also want to add child busses in other surround formats (with fewer channels than the “parent bus”).

Once you have created a surround bus, you can add one or several child busses to it by right-clicking the bus and selecting “Add Child Bus”.

RELATED LINKS

Adding Child Busses on page 31

Routing

You can use the Routing rack in the MixConsole to route audio-related tracks to output busses or group channels with a surround configuration.

RELATED LINKS

Setting Up Direct Routing on page 403

Routing channels to individual surround channels

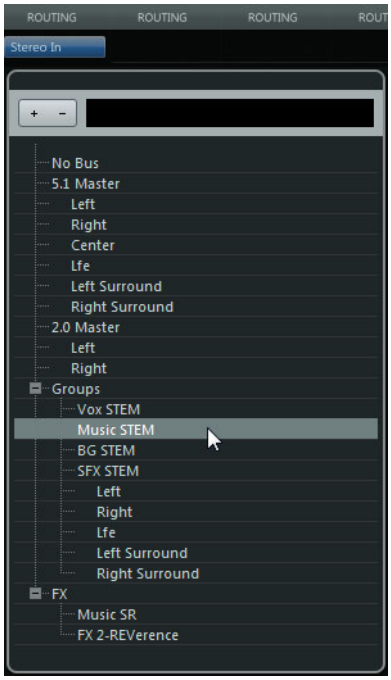
If you want to place an audio source in one separate speaker channel, you can route it directly to that speaker channel. This is useful for premixed material or multi-channel recordings that do not require panning.

- To do this, simply select an individual speaker channel in the Routing rack.
- If a stereo audio channel is routed directly to a speaker channel, the left/right channels are mixed to mono.

  The pan control for the audio channel governs the balance between the left and right channel in the resulting mono mix. Center pan will produce a mix of equal proportion.

Routing channels to child busses

If you have added a child bus within a surround bus (see above), it appears as a subentry of the surround bus on the routing selector. Select this option to route a stereo audio channel directly to that stereo speaker pair of the surround bus (e.g. to route a music track directly to the left and right front speakers in a surround channel).



Input bus configuration

To work with surround sound in Nuendo, it is often not necessary to configure a surround format input bus. You can record audio files via standard inputs, and easily route the resulting audio channels to surround outputs at any stage. You can also directly import multi-channel files of a specific surround format onto audio tracks of the same format.

You should add a surround input bus in the following circumstances:

- You have existing audio material in a specific surround format, and you wish to transfer this material into Nuendo as a single, multi-channel file.
- You wish to record a surround setup “live”.
- You have prepared surround premixes (e.g. stems) that you want to record on a new audio track with a surround configuration.

Using the SurroundPanner V5

Nuendo has a special feature for graphically positioning a sound source in the surround field or modifying existing premixes: the SurroundPanner V5. This plug-in distributes the audio from the input channels in various proportions to the output surround channels.

Whether the SurroundPanner V5 can be used for a specific input/output configuration, depends on whether this configuration can be mapped by the panner. The plug-in supports mapping of mono or stereo inputs to any surround configuration, as well as setups where the input and output channels have the same configuration. In all other cases (e.g. 5.1 to stereo), the MixConvert V6 plug-in is used to map the channel configuration.

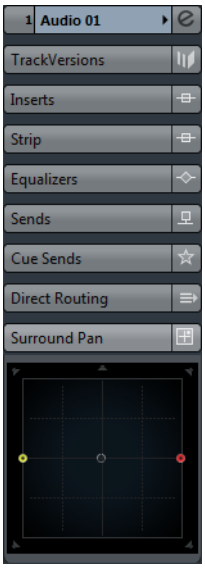
While you need to open the plug-in panel to access all of the panner features, you can perform basic panning operations also in the following places:

- In the MixConsole, a miniature view of the surround plug-in appears at the top of the fader section.

  You can click and drag directly in the miniature image to move the signal source in the surround field.

- In the Inspector, a miniature surround pan control can be displayed in the Surround Pan section.

  This panner view offers click and drag panning as well as speaker channel icons reflecting the solo/mute and deactivation states.



NOTE

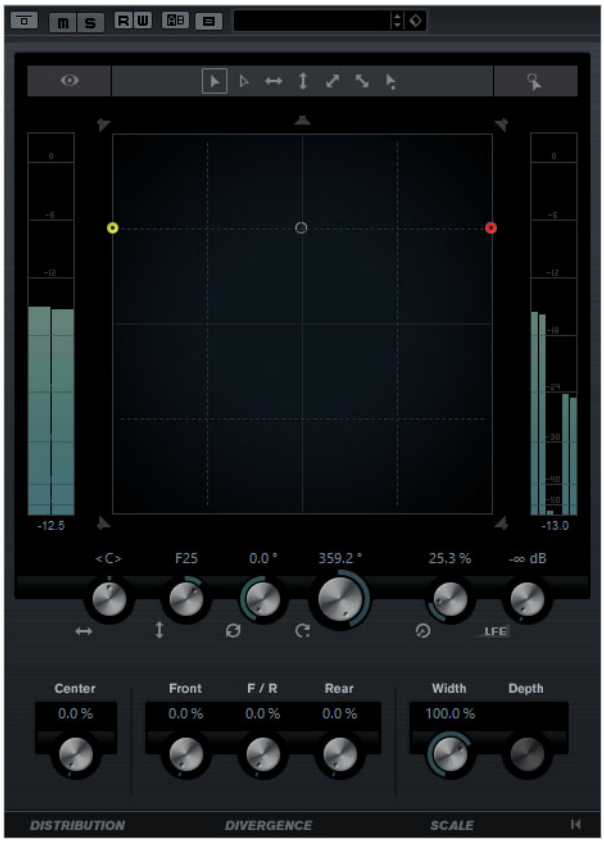
In all miniature panner views you can scale down your movements by holding the [Shift] key while moving the sound source. This allows you to make fine adjustments.

RELATED LINKS

Using the MixConvert V6 plug-in on page 656

The plug-in panel

Double-click on any of the miniature panner controls to open the plug-in panel in a separate window.



The SurroundPanner V5 plug-in offers numerous possibilities to position any supported type of sound source, whether mono, stereo, or multi-channel. If you work visually oriented, you can simply drag the sound source around in the pan area. To help you execute very exact movements you can use modifier keys to limit the movement direction (e.g. for straight front/rear panning).

To perform rotating movements that you cannot achieve by dragging the mouse, you can use the powerful rotation and orbit controls below the pan area. Here you will also find parameters for controlling the signal distribution to the different speaker channels and the advanced scaling controls with which you can influence the size of the sound source itself.

To the left and right of the surround field there are volume meters, showing the input and output levels of all speaker channels. For a detailed description of all the panning options available in the SurroundPanner V5, see below.

Positioning signals in the pan area

In the pan area, you see a graphical representation of the sound source, with the different input channels shown as gray balls – except for the left and right front channels that are shown in yellow and red.

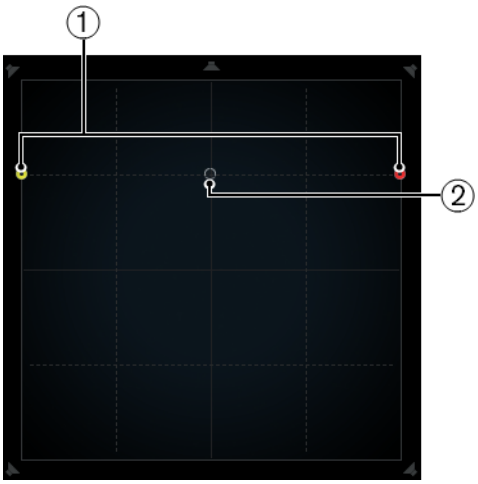
Here, you can position the sound source using the mouse:

- By clicking at the desired position in the pan area.

  When you release the mouse button, the sound source jumps to that position (with the positioning handle, i.e. the circle located in the center of the sound source, ending up where you clicked).

- By clicking and dragging the positioning handle.

  Note that you do not have to click exactly on the handle in order to move it. You can click anywhere in the pan area and start moving the mouse, the handle then moves in the same direction as the mouse.



The pan area showing a 5.1 sound source

1) Left and right channels
2) Positioning handle

The positioning handle can be positioned freely in the pan area and even be moved out of the pan area. The panning balls, though, will never move further out than the edge of the surround field (which is indicated by a gray line). Moving the positioning handle out of the pan area can be useful for extreme panning positions, such as panning all channels hard right.

NOTE

For mono channels there is no positioning handle. Click and drag the input channel to position it.

Speaker channels – Solo and Mute vs. Disabling

The speakers that are distributed around the surround field represent the output configuration. You can disable speakers or solo/mute them.

Muted speaker

This speaker is muted.

Soloed speaker

This speaker is soloed.

Disabled speaker

This speaker is disabled.

- [Alt]/[Option]-click on a speaker symbol to disable that speaker (the speaker symbol is grayed out) so that no audio will be routed to this surround channel. The signal that would otherwise be sent to this speaker is distributed to the other speakers instead. For example, you can disable the center speaker for all stems of a film mix except the dialogue to make sure that only dialogue is sent to that speaker.

  Note that the signal is distributed in such a way that the power level stays constant all the time.

- Click on a speaker symbol to solo that speaker (the speaker symbol turns red). That way you will only hear the signal sent to this speaker. All other speakers are muted (yellow speaker symbol). This can be used for testing purposes, e.g. to make sure that a signal is sent to a specific speaker as intended.

  Note that you can solo several speakers at the same time by clicking on them one after the other. By [Ctrl]/[Command]-clicking on a speaker symbol, this speaker is soloed exclusively, and all other speakers are muted.

NOTE

Solo and Mute cannot be automated!

RELATED LINKS

Constant power on page 656

Restricting movement

By default, you can click anywhere in the pan area and drag the mouse to move the sound source. If you want the positioning handle to jump to a specific position, you can click once at that position.

However, you can also limit movement to a specific direction, using the corresponding modifier keys (or the arrow icons above the pan area). That way you can scale down your movements, or have the sound source move along a certain axis (e.g. from bottom left to top right).

- When you press a modifier key (e.g. [Ctrl]/[Command]), the corresponding icon above the pan area is highlighted with a lighter border, indicating that this mode is active.

  As soon as you release the modifier key, you return to standard mode.

- By clicking on one of the icons above the pan area, the corresponding positioning mode is activated persistently. That way you do not have to keep the corresponding modifier key pressed all the time.

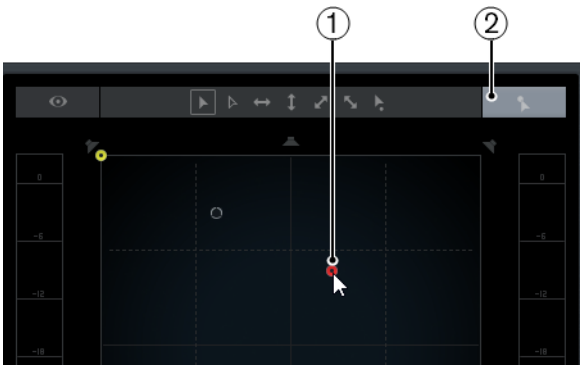
  To deactivate the selected positioning mode, switch back to standard mode.

The following modes are available:

Icon	Modifier key(s)	Description
	-	Standard mode, no restrictions apply.
	[Shift]	Mouse movements are scaled to allow very fine movements. This is useful when panning in the miniature display in the channel, for example.
	[Ctrl]/[Command]	Horizontal movements only.
	[Ctrl]/[Command]-[Shift]	Vertical movements only.
	[Alt]/[Option]	Diagonal movements only (bottom left to top right).
	[Alt]/[Option]-[Shift]	Diagonal movements only (bottom right to top left).
	[Shift]-[Ctrl]/[Command]-[Alt]/[Option]	In this mode the mouse pointer immediately jumps to the positioning handle even if it is located outside the pan area (only visible in Overview Mode).

Panning the left and right channels independently with the mouse

At the top right of the plug-in window you will find the button for the independent positioning mode. If this is activated, you can adjust the front left and right input channels (yellow and red balls) independently by clicking and dragging. This is similar to using the two surround pan joysticks found on some hardware consoles.



1) The right front channel is panned independently with the mouse.

2) The independent positioning mode is activated.

NOTE

To move one of the panning balls in this mode, you do not have to click directly on them. You will always move the panning ball that is nearer to the position of the mouse pointer.

IMPORTANT

- When panning in independent positioning mode, automation data is written for several parameters. Due to this, special automation rules apply.

- Automation data for the independent positioning mode is always written for the complete sound source, not for individual channels. This means it is not possible to record automation for one stereo channel and then add automation for the other stereo channel in a second go, for example.

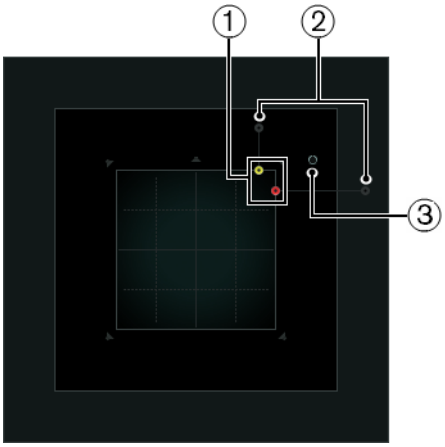
RELATED LINKS

Automation on page 655

Overview Mode

When moving the sound source in the pan area, you will notice that the positioning handle can leave the visible pan area (although the channel panning balls cannot). It can be moved so far outside that all channels end up on the perimeter where the positioning handle left the area. If you now use one of the rotation controls, for example, it can be quite hard to understand what is happening, i.e. why the panning balls are moving the way they are.

To get a better understanding of this behavior, you can switch to Overview Mode. Here you can see where the positioning handle is actually located and where the panning balls would be (if they could leave the pan area). These virtual or “ghost” positions are connected to the actual panning balls inside the surround field by a thin line to help you understand complex movements.



1) The left and right channels cannot leave the pan area.
2) “Ghost” images of the panning balls. These are the theoretical positions outside the visible pan area.
3) The positioning handle is located outside the pan area.

- To switch to Overview Mode, click on the eye icon above and to the left of the pan area.

NOTE

The Overview Mode is only used for visualizing the complex scenarios that you can create with the SurroundPanner V5. The actual panning is done in the standard view. Therefore, the speakers are visible in this mode, but cannot be soloed/muted or disabled.

Left-right and front-rear panning

These two controls are used to pan the sound source from left to right and front to rear, and vice versa. This can be useful when an object moves through the scene, e.g. a car driving through from the left to the right or a spaceship passing overhead.

NOTE

This is the same as restricting the movement direction using the [Ctrl]/[Command] and [Ctrl]/[Command]-[Shift] modifiers.

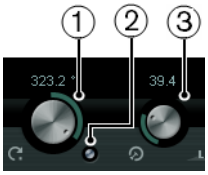
Rotating signals

The Rotate Signal control is used to rotate the source channels around the positioning handle. All input channels circle around the handle (but they cannot move beyond the borders of the surround field).

Usually, you would use this control on a premixed stem, i.e. a group channel that already has surround qualities. For example, if you are working on a scene where the camera turns around, you can rotate the surround sound source within the surround field of the output bus to imitate this behavior.

Orbit controls

The Orbit controls are used to rotate the sound source (including all input channels and the positioning handle) around the center of the surround field.



1) Orbit Center
2) Counter Shot
3) Radius

Orbit Center

This is the main control that allows you to perform the rotation. For example, you can use this if a person walks around in a scene and can still be heard when walking “behind the audience”.

Counter Shot

The Counter Shot control is used to rotate the sound source by exactly 180°, thereby “flipping” the surround image to the opposite side.

For example, this can be used when working on a close-up scene of two people sitting face to face with a lot of reverse shots. With the Counter Shot button you can then flip the surround field each time that the camera switches from perspective A to perspective B or back.

NOTE

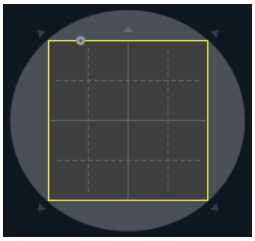
This control is best applied to premixes (e.g. the ambience stem) so that you only have to press the button once for each cut.

Tip: When panning a scene with reverse shots with less than 180° (so that you cannot use the Counter Shot button) you can make the necessary adjustments for the first perspective of the reverse shot manually, write this as automation and use the punch log function to save this setup. Repeat this for the second perspective, and afterwards use the punch log entries to switch between the two perspectives with just a click.

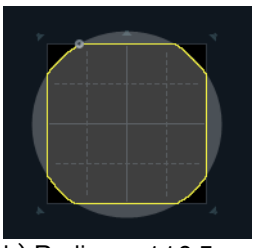
Radius

When using the Orbit Center control, the Radius encoder allows you to control the distance of the sound source from the center of the surround field (without changing the angle).

An example:



a) Radius = 141.4



b) Radius = 116.5

The gray circle shows the theoretical path of the sound source when orbiting the center. Since the sound source cannot leave the pan area, it moves along the perimeter instead. At the maximum radius setting (a) the theoretical path lies outside the pan area so that the sound source stays on the perimeter all the time; at a smaller setting (b) the circle is smaller and the sound source moves inside the pan area in the corners.

NOTE

The Rotate Signal, Orbit Center, and Radius controls are endless rotary encoders so that there is no limit as to how far left or right you can rotate the sound source.

IMPORTANT

In terms of automation, the Orbit Center, Counter Shot, and Radius controls are not independent parameters as such. Instead, a combination of different automation parameters is used.

RELATED LINKS

Punch Log on page 683
Automation on page 655

The LFE encoder

Use the LFE encoder in the plug-in panel to set the signal amount sent to the LFE (Low Frequency Effects) channel.

- If the selected input already contains an LFE channel (x.1 configuration), it is routed through the SurroundPanner V5 and the LFE encoder is used to control the volume of this channel.
- If the selected input does not contain an LFE channel (x.0 configuration), all input channels are distributed evenly to the output LFE channel. In this case, it might be useful to raise the volume of this “downmix” using the LFE encoder.

NOTE

The LFE channel is used as a full range channel, no low-pass filtering is applied.

Center Distribution

The Center Distribution control is used to distribute part or all of the center signal to the left and right front speakers.

For example, this can be useful in the following situation: The center signal is panned directly to the center speaker and the Center Distribution is set to 0%. However, the signal is too discrete for your liking, and you want to add part of the signal to the left and right front speakers to widen it. You can do this by raising the Center Distribution value. At 100%, the center source is provided entirely by the phantom image created by the left and right speakers and using a value in between you can distribute the signal to the three speakers.

A blue line at the top of the surround field indicates the distance up to which a phantom signal is added. If you position the source signal inside this range, the signal is sent to all three channels.

IMPORTANT

Note that for this to work, the front speaker configuration needs to be symmetrical and there can never be more than 3 speakers involved.

Divergence controls

The three divergence controls (Front, F/R, and Rear) determine the attenuation curves used when positioning sound sources for X-axis front, Y-axis (front/rear), and X-axis back. If all three controls are set to 0%, positioning a sound source on a speaker sets all other speakers to zero level. With higher values, the other speakers receive a percentage of the sound source.

Blue horizontal and vertical lines visualize the effects when changing the divergence settings.

For example, by using the front divergence, you can acoustically intensify the distance from the action on screen as perceived by the audience.

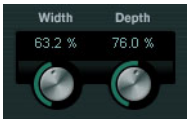
- At 0% the perception is very focused (concentrated in one spot). This can be used for movements close to the camera to intensify the feeling that something is taking place right in front of the viewer.
- At 100% the perception is very diffuse (hard to locate). This can be used for actions that are taking place at the far back of the scene, giving the audience the feeling that it is far away from the action.

NOTE

The Center Distribution value and the front divergence are combined. If the front divergence is set to 100%, the Center Distribution has no effect.

Scaling

The Scale controls allow you to control the horizontal (Width) and vertical (Depth) expansion of the sound source. 100% corresponds to the complete width or depth of the surround field. If you reduce both values to 0%, the distance is reduced to zero and all source channels are centered in one spot.



These controls influence the perception of spatiality and ambience, as well as the traceability of signals.

- At 100% you get a very transparent, clear sound that conveys much spatiality.
- At 0% the signal is less transparent and movements cannot be traced easily.

NOTE

The Depth parameter is only available for configurations with front and rear channels.

Input and output level meters

The meters to the left and right of the pan area show the volume of all input and output speaker channels, respectively. The numeric values below the meters indicate the peak level that has been measured for any of the channels.

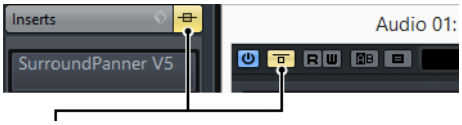
General plug-in controls

The Bypass Effect button

At the top left of the plug-in panel you will find a button to bypass the SurroundPanner V5. If this is activated, the input signals are directly routed to the output channels (in case of an identical input and output configuration). If the output configuration is different from the input configuration, the panner attempts to route the input signals to the appropriate output channels (e.g. the left and right front speakers if panning a stereo signal to a 5.1 configuration).

NOTE

When using the SurroundPanner V5 as an insert effect, this button has the same function as the Bypass Effect button available for all audio plug-ins.



Bypass Effect button

Mute/Solo buttons

At the top of the plug-in panel you will find a Mute and a Solo button that are identical with the channel's Mute/Solo controls.

IMPORTANT

These buttons are not present when the SurroundPanner V5 is used as an insert effect.

Read/Write buttons

Like any other effect plug-in, the SurroundPanner V5 has Read and Write buttons at the top of the window to apply and record automation data (see below). When the panner is used on an output channel, these buttons are identical with the channel's Read and Write buttons. When used as an insert effect, automation data for this insert is written separately.

RELATED LINKS

Deactivating vs. Bypassing on page 443
Using Solo and Mute on page 381

Automation

Most of the parameters in the SurroundPanner V5 plug-in can be automated just like any other channel or insert parameter.

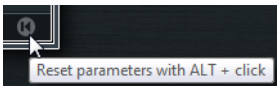
Recording automation for the Orbit controls and the independent positioning mode is handled differently, however. Automation data for these parameters is written as a combination of the front-rear panning, left-right panning and the Rotate Signal parameters. For the independent positioning mode, Scaling is added. Due to this you cannot easily modify existing automation data since this would involve too many different parameters. If an automation pass did not yield the desired result, simply try again.

RELATED LINKS

Writing Automation Data on page 659

Resetting all parameters

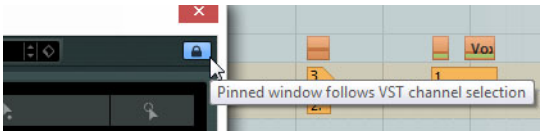
[Alt]/[Option]-click the Reset button in the lower right corner of the plug-in panel to reset all controls to their default values.



Pinning the SurroundPanner V5 window

When working with multiple channels in a surround configuration, the screen might become overcrowded with plug-in windows and you can easily lose track of where each panner window belongs.

If you want to work with only one panner window at a time, you can open the SurroundPanner V5 for one of your channels and activate the “Pinned window follows VST channel selection” button at the top of the plug-in panel. When you now select a different channel or bus, the settings for the new channel are displayed in the same window.



“Pinned window follows VST channel selection” is activated

Standard panners and the MixConvert V6 plug-in are also shown in the pinned window. However, if you select a channel for which no panner view is available, the pinned window continues to show the last available panner view. In this case the panner view will not be consistent with the selected channel.

- If necessary, you can still open additional SurroundPanner windows by double-clicking the corresponding miniature panner view in the MixConsole.

IMPORTANT

A panner instance cannot be opened in more than one window at once. If “Pinned window follows VST channel selection” is activated and you step through your channels (e.g. in the MixConsole), those channels with “auxiliary” windows are skipped.

Constant power

“What goes in, must come out again.” This principle can be taken literally with regard to the SurroundPanner V5. It means that the power of a source channel is identical to the power of the corresponding output signal.

The advantage of this is that the overall volume as perceived by the listener (= the power) is always the same, regardless of the signal panning, e.g. when you move the sound source in the pan area, disable specific speaker channels, or use the divergence controls.

Using the MixConvert V6 plug-in

MixConvert V6 is a special plug-in that converts one multi-channel audio source into another multi-channel destination. It is most frequently used to “downmix” a multi-channel surround mix into a format with fewer channels, for example, a 5.1 surround mix into a stereo mix.

This plug-in can be used as an insert effect in the MixConsole like other plug-ins but it also has special functions. Nuendo automatically inserts MixConvert V6 instead of the SurroundPanner V5 when the channel (audio track, group channel, etc.) is routed to a destination with fewer audio paths. MixConvert V6 is also inserted in place of any cue send panner when the destination has a different audio path than the source.

The MixConvert V6 plug-in is described in detail in the separate PDF document “Plug-in Reference”.

NOTE

There is one exception to this behavior. When a stereo channel is routed to a mono destination through the channel routing or a cue send routing, a normal stereo panner will be inserted. However, this panner will control the balance of the left and right channels as they are blended into the mono destination. The center position blends both channels together by equal amounts. With the pan set all the way to the left, only the left channel can be heard, and vice versa.

Exporting a surround mix

When you have set up a surround mix, you can choose to export it using the Export Audio Mixdown function.

You have the following export options when working with a surround configuration:

- Export to “split” format, resulting in one mono audio file for each surround channel.
- Export to interleaved format, resulting in a single multi-channel audio file (e.g. a 5.1 file, containing all six surround channels).
- On Windows systems, you can also export a 5.1 surround mix to a file in Windows Media Audio Pro format.

  This is an encoding format tailored for 5.1 surround.

RELATED LINKS

Export Audio Mixdown on page 1018
Windows Media Audio Pro files (Windows only) on page 1032

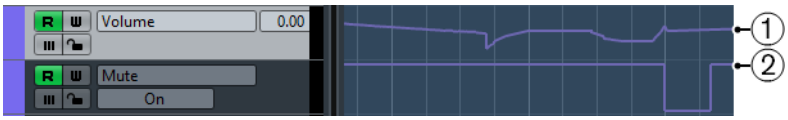
Automation

In essence, automation means recording the values for a particular MixConsole or effect parameter. When you create your final mix, you will not have to worry about having to adjust this particular parameter control yourself, Nuendo can adjust this particular parameter control.

Automation Curves

Within a Nuendo project, the changes in a parameter value over time are reflected as curves on automation tracks.

There are two kinds of automation curves:



1) **Ramp curves**

   Ramp curves are created for any parameter that generates continuous multiple values, such as fader or encoder movements.

2) **Jump curves**

   Jump curves are created for on/off parameters such as mute.

Static Value Line

When you open an automation track for the first time, it does not contain any automation events. This is reflected in the event display as a straight horizontal black line, the static value line. This line represents the current parameter setting.

If you manually added any automation events or used write automation for the corresponding parameter and then disable the reading of automation data, the automation curve is grayed-out in the event display and the static value line is used instead.

As soon as **Read** is enabled, the automation curve becomes available.

Write/Read Automation

You can automation enable tracks and MixConsole channels by activating their automation write **W** and read **R** buttons.

- If you activate **W** for a channel, virtually all MixConsole parameters that you adjust during playback for that specific channel are recorded as automation events.
- If **R** is activated for a channel, all your recorded MixConsole actions for that channel are performed during playback.

The **R** and **W** buttons for a track in the track list are the same as the **R** and **W** buttons in the MixConsole.

NOTE

The **R** button is automatically enabled when you enable the **W** button. This allows Nuendo to read existing automation data at any time. You can separately deactivate **W** if you only want to read existing data.

There are also global read and write indicator buttons **Activate/Deactivate Read/Write for All Tracks** on the MixConsole toolbar and at the top of the track list. These buttons light up as soon as there is an enabled **R** or **W** button on any channel/track within your project. Furthermore, they can be clicked to activate or deactivate the **R**/**W** buttons of all tracks simultaneously.

NOTE

R/**W** buttons are also available on the Automation panel.

RELATED LINKS

Read/Write Buttons on page 668

Writing Automation Data

There are two approaches that you can use to create automation curves: manually and automatically.

- Manual writing makes it easy to quickly change parameter values at specific points without having to activate playback.
- Automatic writing lets you work almost as if you were using a real mixer.

With both methods, any applied automation data is reflected in both the MixConsole (a fader will move for example) and in the corresponding automation track curve.

RELATED LINKS

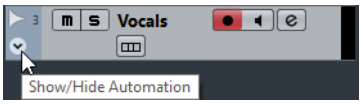
Manual Writing of Automation Data on page 660

Automatic Writing of Automation Data

Every action that you perform is automatically recorded on automation tracks which you can later open for viewing and editing.

PROCEDURE

1. In the track list, click **Show/Hide Automation** for a track to open its automation track.



2. Click **W** to enable the writing of automation data on this track.
3. Start playback.
4. Adjust the parameters in the **MixConsole**, in the **Channel Settings** window, or in the effect control panel.

   The value settings are recorded and displayed as a curve on the automation tracks. When automation data is being written, the color of the automation track changes to red and the delta indicator in the automation track shows the relative amount by which the new parameter setting deviates from any previously automated value.
5. Stop playback and return to the position where you started playback.
6. Click **W** to disable the writing of automation data.
7. Start playback.

RESULT

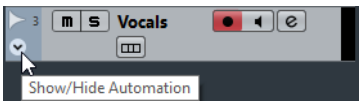
All actions that you recorded are reproduced exactly. When you drag a plug-in to a different insert slot on the same channel, any existing automation data moves with the plug-in. When you drag it to an insert slot on a different channel, any existing automation data is not transferred to the new channel.

Manual Writing of Automation Data

You can add automation events manually by drawing automation curves on an automation track.

PROCEDURE

1. In the track list, click **Show/Hide Automation** for a track to open its automation track.



2. Click the automation parameter name and select the parameter from the pop-up menu.
3. Select the **Draw** tool.

4. Click on the static value line.

   An automation event is added, read automation mode is automatically activated, and the static value line changes to a colored automation curve.

5. Click and hold to draw a curve by adding many automation events.

   When you release the mouse button, the number of automation events is reduced.

   NOTE

   To adjust the thinning out of events, select **File > Preferences > Editing** and change the **Automation Reduction Level**.

6. Start playback.

RESULT

The automated parameter changes with the automation curve, and the corresponding fader in the MixConsole moves accordingly.

AFTER COMPLETING THIS TASK

Repeat the procedure if you are not happy with the result. If you draw over existing events, a new curve is created.

Tools for Drawing Automation Data

Apart from the **Draw** tool, you can use the following tools to draw automation events:

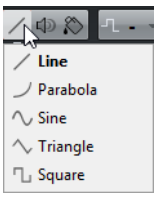
- **Object Selection** tool

  If **R** is activated and you click on an automation track with the **Object Selection** tool, you can add automation events.

  NOTE

  Events that are introduced between two existing events that do not deviate from the existing curve are removed as soon as you release the mouse button.

To activate the **Line** tool in any other available mode, click the **Line** tool and click again to open a pop-up menu where you can select the mode.



The following **Line** tool modes are available:

Line mode

If you click on the automation track and drag with the **Line** tool in **Line** mode, you can create automation events in a line. This is a quick way to create linear fades, etc.

Parabola mode

If you click and drag on the automation track with the **Line** tool in **Parabola** mode, you can create more natural curves and fades.

NOTE

The result depends on the direction from which you draw the parabolic curve.

Sine, Triangle, or Square mode

If you click and drag on the automation track with the **Line** tool in **Sine**, **Triangle**, or **Square** mode and snap to grid is activated, the period of the curve (the length of one curve cycle) is determined by the grid setting. If you press [Shift] and drag, you can set the period length manually, in multiples of the grid value.

NOTE

The **Line** tool can only be used for ramp type automation curves.

Editing Automation Data

Automation events can be edited much like other events.

You can cut, copy, paste, and nudge events, etc.

- If you move an event or part on a track and you want the automation events to follow automatically, select **Edit > Automation follows Events**.

  All automation events for the track between the start and end of the event or part are moved. Any automation events at the new position are overwritten.

Selecting Automation Events

- To select an automation event, click it with the **Object Selection** tool.

  The event turns black, and you can drag it in any direction between two events.

- To select multiple events, [Shift]-click the events or drag a selection rectangle with the **Object Selection** tool.

  All events inside the selection rectangle are selected and the automation track editor becomes available.

- To select all automation events on an automation track, right-click the automation track and select **Select All Events** from the context menu.

Removing Automation Events

- To remove an automation event, click on it with the **Erase** tool.
- To remove multiple automation events, select them and press [Backspace] or [Delete] or select **Edit > Delete**.

  When **Use Virgin Territory** is enabled, this creates a gap. When disabled, the events within the range are removed.
- To remove all automation events from the automation track and close the automation track, click the automation parameter name in the track list and select **Remove Parameter** from the pop-up menu.

NOTE

When removing automation events, the curve is redrawn to connect the remaining events.

RELATED LINKS

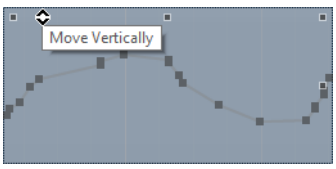
Virgin Territory vs. Initial Value on page 666

Adjusting Automation Ramp Curves

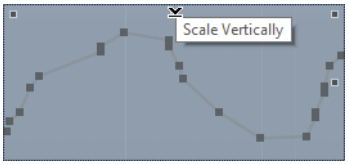
You can adjust automation ramp curves in the automation track editor.

- To open the automation track editor, activate the **Object Selection** tool and drag a selection rectangle on a ramp type automation track.

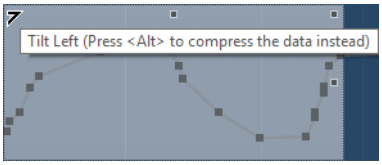
On the borders of the automation track editor, smart controls for specific editing modes are displayed:



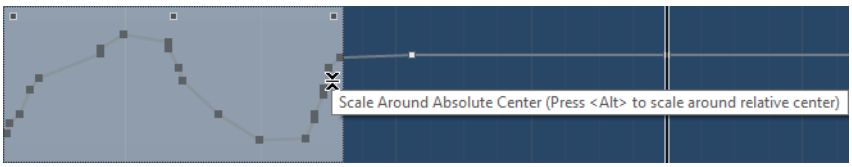
- To move the entire curve up or down, click in an empty area on the upper border of the editor. This is useful to boost or attenuate a curve.



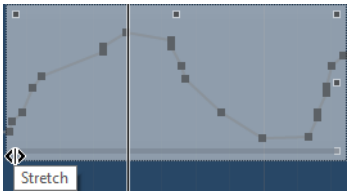
- To raise or lower the values in relative amounts, click in the middle of the upper border of the editor.



- To tilt the left or the right part of the curve, click in the upper left or right corner of the editor. This is useful if the curve form is exactly the way that you want it, but the start or end needs to be boosted or attenuated a bit.
- To compress the left or the right part of the curve instead, [Alt]/[Option]-click in the upper left or right corner of the editor.



- To scale the curve around the absolute center, for example, horizontally around the center of the editor, click in the middle of the right border of the editor.
- To scale the curve relative to its center instead, [Alt]/[Option]-click in the middle of the right border of the editor.



- To stretch the selected curve, click and drag in the lower part of the editor.

  [Shift]-click on any of the smart controls to scale vertically.
- To scale the automation curves on several tracks at the same time, drag a selection rectangle across the corresponding automation tracks, hold down [Ctrl]/[Command], and use the scaling smart controls.
- To move the whole selection up/down or left/right, click inside the editor and drag.
- To restrict the direction to horizontal or vertical movement, press [Ctrl]/[Command] and drag.

NOTE

Snap is taken into account when moving automation curves horizontally.

Automation Tracks

Most of the tracks in your project have automation tracks, one for each automated parameter.

Automation tracks are hidden by default.

Showing/Hiding Automation Tracks

- Position the mouse pointer over the lower left corner of the track and click the arrow icon (**Show/Hide Automation**) that appears.
- Right-click the track in the track list and select **Show/Hide Automation** from the context menu.
- To open another automation track, position the mouse pointer over the lower left corner of an automation track, and click **+** (**Append Automation Track**).
- To show all used automation tracks in the track list, right-click any track and select **Show All Used Automation** from the context menu.
- To open the corresponding automation track on writing automation parameters, **Project > Automation Panel > Automation Settings > Reveal Parameter on Write**.

Removing Automation Tracks

- To remove an automation track together with all automation events, click the parameter name and from the pop-up menu, select **Remove Parameter**.
- To remove all automation tracks from a track that do not contain automation events, select **Remove Unused Parameters** from any of its automation parameter name pop-up menus.
- To remove automation tracks, you can also select **Project > Automation Panel > Functions** and select one of the options to delete automation.

Assigning a Parameter to an Automation Track

Default parameters are already assigned to automation tracks when you open them, according to their order in the parameter list.

PROCEDURE

1. Open an automation track and click on the automation parameter name.

   A parameter list is shown. The contents depend on the track type.
2. From the pop-up menu, select the parameter or select **More** to open the **Add Parameter** dialog that lists all parameters that can be automated, and select the parameter there.

3. Select the Parameter.

   The parameter replaces the current parameter in the automation track.

   NOTE

   The replacing of the automation parameter is non-destructive. If the automation track contains any automation data for the parameter that you just replaced, this data is there, although it is not visible. By clicking on the automation parameter name in the track list, you can switch back to the replaced parameter. On the pop-up menu, all automated parameters are indicated by an asterisk (*) after the parameter name.

Muting Automation Tracks

By muting an automation track you turn off automation for a single parameter.

- To mute individual automation tracks, click their **Mute** buttons in the track list.

Virgin Territory vs. Initial Value

For parameter automation, Nuendo works either with an initial value or with virgin territory.

When no automation data exists for a particular parameter, the starting point of an automation pass is saved as the initial value. When you punch out of the automation pass, it is this initial value to which the parameter will return. This has one important consequence: As soon as the initial value is set, the corresponding parameter is fully automated for the complete track, at any given timecode position of the project – even if your automation pass lasted only 2 seconds. When you release a control, it returns to the value that is defined by the automation curve – even when in Stop mode.

When you enable **Use Virgin Territory**, no automation curve is displayed on the automation track, and you find automation data only where you actually perform an automation pass. After an automation pass you will find virgin territory only to the right of the last automation event.

Creating Gaps

Gaps are empty sections between two automation curves. You can create gaps inside a section with automated values.

PROCEDURE

1. Select **Project > Automation Panel**.
2. Click **Automation Settings**, and activate **Use Virgin Territory**.
3. With the **Range Selection** tool, select a range on an automation track with existing automation data, and press [Delete] or [Backspace].

RESULT

A gap is created, and new events at the beginning and the end of the selection range are created. These mark the end point of the automation curve to the left and the start of the next automation curve to the right of the gap.

Defining a Terminator Point

You can define any automation event on the automation curve as the terminator point of this part of the curve. This will automatically delete the line between this event and the next one, creating a gap.

PROCEDURE

1. In the automation curve, click the event that you want to define as the last point to select it.
2. In the **Project** window info line set **Terminator** to **Yes**.

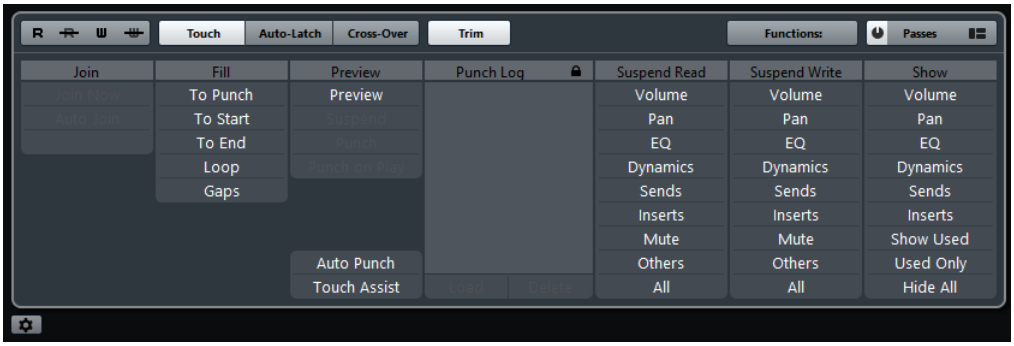
   The line between this event and the next one is deleted and a gap is created.

   NOTE

   If you define the last automation event of an automation curve as terminator point, any automation data to the right of this event (as defined by an initial value) is deleted.

Automation Panel

The Automation panel is a floating window, similar to the MixConsole and Transport panel, and can be left open while you work.



To show the Automation panel, do one of the following:

- Select **Project > Automation Panel**.
- On the **Project** window toolbar, click **Open Automation Panel**.
- Press [F6].

Read/Write Buttons

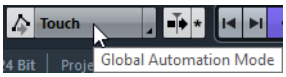
In the upper part of the Automation panel, you will find the **Read** and **Write** buttons. These are used to globally enable or disable the **Read** and **Write** buttons on all tracks.

- To enable all **Read** buttons on all tracks/channels of your project, click **Activate Read for all tracks**.
- To disable all **Read** buttons, click **Deactivate Read for all tracks**.
- To enable all **Write** buttons and, at the same time, all **Read** buttons on all tracks/channels of your project, click **Activate Write for all tracks**.
- To disable all **Write** buttons, click **Deactivate Write for all tracks**. The **Read** buttons will remain enabled.

Automation Modes

Nuendo provides three different punch out modes for automation: Touch, Auto-Latch, and Cross-Over. In all three modes, automation data will be written as soon as a parameter control is touched in play mode. They differ in their punch out behavior.

The automation modes are available on the upper part of the Automation panel and on the Project window toolbar on the **Global Automation Mode** pop-up menu.



NOTE

The automation mode set on the Automation panel or the **Project** window toolbar is used globally for all tracks of your project. If you want to select a different automation mode for individual tracks, select the track and on the **Track Automation Mode** pop-up menu in the Inspector select the corresponding option.

You can change the automation mode at any time, for example, in play or stop mode or during an automation pass. You can also assign key commands to the automation modes.

The current automation pass will always punch out as soon as one of the following conditions is met, independent of which automation mode is selected:

- If you disable **Write**.
- If you stop playback.
- If you activate **Fast Forward**/**Rewind**.
- If the project cursor reaches the right locator in **Cycle** mode.

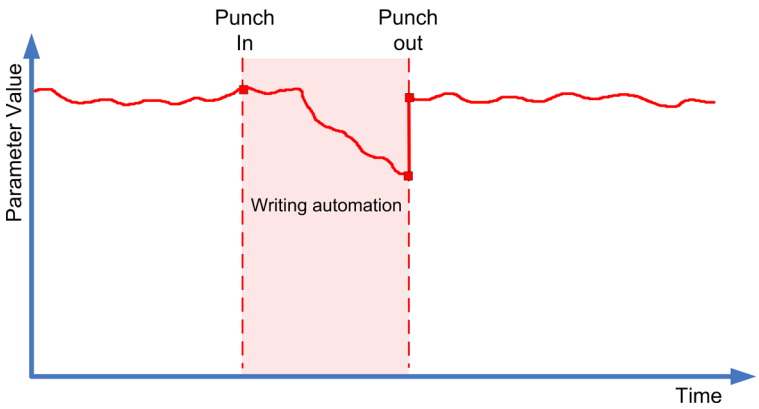
- If you click in the ruler to move the project cursor. This is user-definable and can be controlled via the Automation panel.

RELATED LINKS

Automation Settings on page 685

Touch

Touch mode is useful in situations where you want to make a change lasting only a few seconds to an already set up parameter.



- Touch writes automation data only for as long as you actually touch a parameter control. Punch out occurs as soon as you release the control.
- After punch out, the control returns to the previously set value.

NOTE

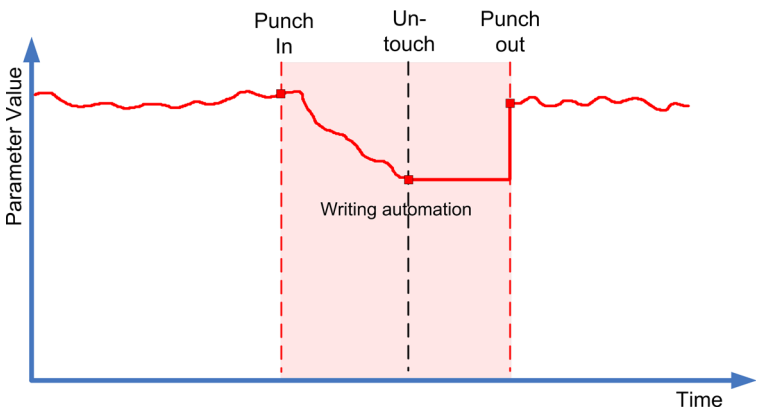
You can set the time it takes for the parameter to reach the previously set value with the **Return Time** setting in the **Automation Preferences**.

RELATED LINKS

Automation Settings on page 685

Auto-Latch

Auto-Latch is useful in situations where you want to keep a value over a longer period of time – for example when making EQ settings for a particular scene. In Auto-Latch mode, there is no specific punch out condition other than those that are valid in all modes.



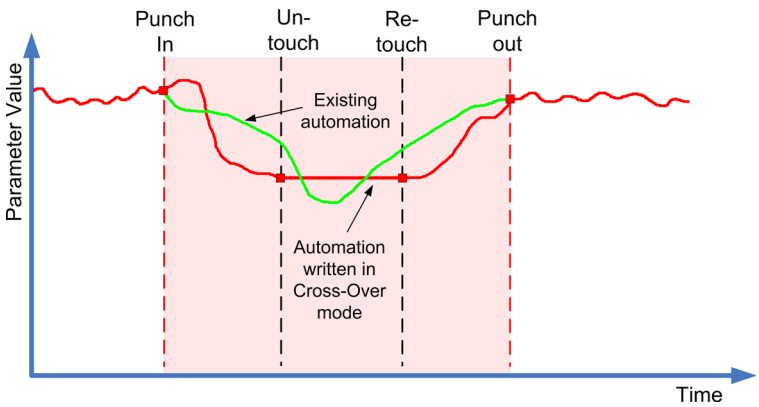
- Once your pass has started, the writing of automation data continues for as long as playback lasts or **Write** is enabled.
- When you release the control, the last value is kept until you punch out.

NOTE

The automation mode for On/Off switches is always Auto-Latch even if another mode is selected globally or for the track.

Cross-Over

Cross-Over mode allows you to perform a manual return to ensure smooth transitions between new and existing automation settings. For Cross-Over, the punch out condition is crossing over an already existing automation curve after touching the parameter for a second time. The Cross-Over mode can be used in situations where you are not satisfied with an automation curve or with the automatically applied return settings.



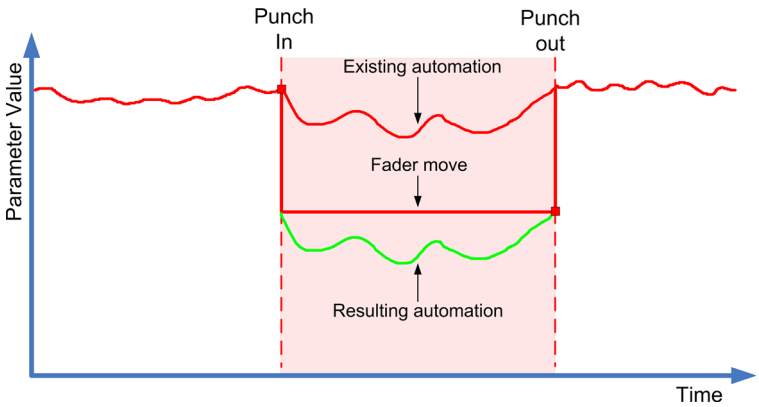
- Once your pass has started, the writing of automation data continues for as long as playback lasts or **Write** is enabled.
- When you release the control the automation pass continues, with the value setting remaining the same.
- When you re-touch the fader and move it towards the original value, punch out occurs automatically as soon as you cross the original curve.

RELATED LINKS

Automation Settings on page 685

Trim

Trim allows you to to modify the automation curve from a previous pass. If you activate **Trim**, a trim curve is positioned in the middle of the automation track.



NOTE

Trim works for channel volume and cue send level adjustments.

If you activate **Trim**, all editing and recording affects the trim curve. If you deactivate Trim, it affects the original automation curve instead.

You can edit trim data like any other automation data. It is stored with the project.

- Drag the trim curve up or down and add automation events to it.

  These increase or decrease the values of the original automation curve, but allow you to preserve the original data.

You can use Trim either in Stop or in Play mode:

- In Stop mode, you can select one of the **Fill** options and edit the trim curve manually by clicking on it and moving it up or down. The original automation curve is displayed in a lighter color and its values are merged with the trim curve. The resulting automation curve is displayed in a darker color.
- In Play mode, the events of the original automation curve are trimmed as the project cursor passes over them.

Freeze Trim

You can freeze your trim curve automatically or manually. This renders all trim data into a single automation curve.

- To freeze your trim curve automatically whenever a write operation is finished, open the **Automation Settings** and select **On Pass End** in the **Freeze Trim** pop-up menu.

- To freeze your trim curve automatically when Trim mode is switched off, open the **Automation Preferences** and select **On Leaving Trim Mode** in the **Freeze Trim** pop-up menu.
- To freeze your trim curve manually, open the **Automation Settings** and select **Manually** in the **Freeze Trim** pop-up menu. To freeze a specific parameter for the track click the parameter name and from the pop-up menu select **Freeze Trim**.

  To freeze the trim automation for all tracks in the project, open the Automation panel, and in the **Functions** pop-up menu select **Freeze All Trim Automation in Project**.
- To freeze the trim automation of all selected tracks, open the Automation panel, and in the **Functions** pop-up menu select **Freeze Trim Automation of Selected Tracks**.

Cleaning Automation

You can delete redundant automation points or unwanted automation spikes that are caused by editing automation points or inaccurate writing of automation data.

Reducing Automation Events

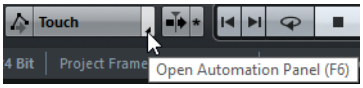
Editing automation points can result in redundant automation points. The **Reduce Automation Events** function allows you to reduce the number of redundant points and to smoothen the automation curve.

NOTE

In the **Automation Settings**, you can set the **Reduction Level**.

PROCEDURE

1. On the toolbar, click **Open Automation Panel**.



2. On the **Automation Panel**, click **Functions**.
3. On the pop-up menu, select one of the following options:
   - To reduce the number of automation points for all tracks in the active project, select **Reduce Automation Events**.
   - To reduce the number of automation points for selected tracks only, select **Reduce Automation Events of Selected Tracks**.

RELATED LINKS

Reduction Level on page 686

Deleting Automation Spikes

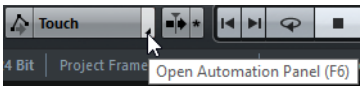
Editing automation points or inaccurate writing of automation data can result in situations where the values briefly return to their initial value, visible as spikes in the automation curve or as jumping faders. The **Delete Automation Spikes** function allows you to delete these spikes in the automation curve.

NOTE

In the **Automation Settings**, you can set a **Spike Detection Range** from 0 to 200 ms.

PROCEDURE

1. On the toolbar, click **Open Automation Panel**.



2. On the **Automation Panel**, click **Functions**.
3. On the pop-up menu, select one of the following options:
   - To delete automation spikes for all tracks in the active project, select **Delete Automation Spikes**.
   - To delete automation spikes for selected tracks only, select **Delete Automation Spikes of Selected Tracks only**.

RELATED LINKS

Spike Detection Range on page 686

Functions

At the top right of the Automation panel, you will find the **Functions** pop-up menu, which contains a number of global automation commands.

Delete All Automation in Project

Removes all automation data from your project.

Delete Automation of Selected Tracks

Removes all automation data for the selected tracks.

Delete Automation in Range

Deletes all automation data between the left and right locators on all tracks.

Fill Gaps on Selected Tracks

This option is used with virgin territories. Select this to fill any gaps in the automation curves of the selected tracks with a continuous value. The value of the last event (the end point) of a section is used to fill the gap. This value is written across the gap up to one millisecond before the first event of the next automated section. A new event is inserted here; the value will be ramped to the next automated section.

Fill Gaps with Current Value (Selected Tracks)

This option is used with virgin territories. Select this option to fill any gaps in the automation curves of the selected tracks. The gaps are filled with the current value of the corresponding control.

Create Initial Parameter Events

This function creates and stores the initial automation values for each automatable parameter in the MixConsole. For parameters that have not been automated yet, automation events are created at the current parameter position, for example, at value 0. As initial parameter events are created on all channels, all channels will have automation data, even if you did not add automation to them. If this is not what you want, use the **Global Snapshot** function instead.

Freeze All Trim Automation in Project

Freezes all trim automation for all tracks in the project.

Freeze Trim Automation of Selected Tracks

Freezes all trim automation for the selected tracks.

Global Snapshot: Store

Use this function to save a backup copy of all automatable MixConsole parameters as a snapshot so that you can reapply them later. The snapshot is saved with the project. You can only save one snapshot at a time. By storing a snapshot, a previously stored snapshot may be overwritten.

Global Snapshot: Apply

Applies the stored snapshot.

Global Snapshot: Remove

Removes the stored snapshot.

Reduce Automation Events

Allows you to delete redundant automation points and smoothen the automation curve for all tracks in the active project.

Reduce Automation Events of Selected Tracks

Allows you to delete redundant automation points and smoothen the automation curve for the selected tracks.

Delete Automation Spikes

Allows you to delete automation spikes in the automation curve for all tracks in the active project.

Delete Automation Spikes of Selected Tracks

Allows you to delete automation spikes in the automation curve for the selected tracks.

Automation Passes

An automation pass begins with the first parameter that is written after activating Write automation and starting playback. It ends when playback stops, either when you click the **Stop** button or when the position cursor jumps to another position. This occurs when Cycle or Arranger mode is activated. You can undo automation passes in the Automation Pass history.

Activating Automation Passes

PROCEDURE

1. At the top right of the Automation panel, click the **Activate Automation Passes** button.
2. Click the **Passes** button to open the automation pass history.
3. Activate **Write** automation and perform some actions.

   NOTE

   Automation passes are only created when you write automation automatically. If you want to undo manually written automation events use the Edit History instead.

RESULT

The **Activate Automation Passes** button turns red to indicate that an automation pass is running and the pass is written to the history.

Undoing Automation Passes

PROCEDURE

1. In the automation pass history, drag the horizontal line upwards.

   The corresponding automation events on the automation track are removed and the entries in the Automation pass history are grayed out. The State column displays **Undone**.

   NOTE

   All automation that you performed manually as well as other edits and processes performed during or after the automation passes are also undone.

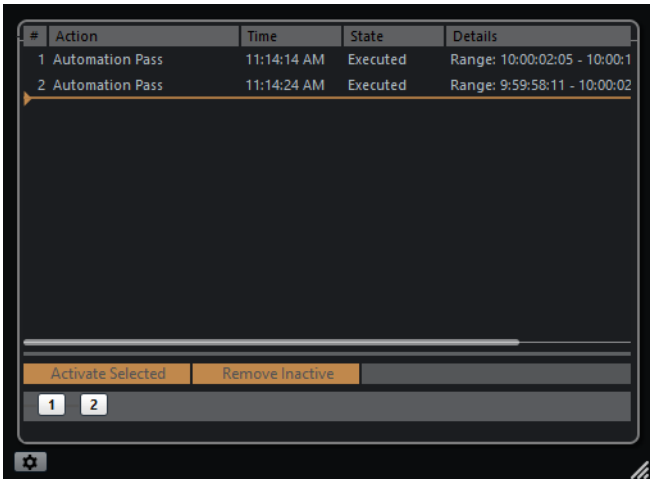
2. If you want to redo automation passes again, drag the horizontal line downwards.

   The corresponding automation events on the automation track are inserted and the **State** column shows **Executed** again.

Undoing Branches

A branch is a sequence of automation passes.

In a branch each automation pass is represented by a rectangle with the number of the automation pass. Automation that you perform manually, as well as other edits and processes in between automation passes, are represented by smaller rectangles. These rectangles only serve as indicators, they cannot be used to undo the edits.



When you undo an automation pass and subsequently write new automation, a new branch is created and all following automation passes are gathered in the new branch.

If you have two or more branches, you can choose to undo the automation passes of the separate branches in the automation pass history by activating and deactivating specific branches.

Deactivating Undo Branches

PROCEDURE

1. Select **Edit > History**.
2. In the right section of the **Edit History** dialog, click a branch to select it.

   The actions of the selected branch are displayed in the left section of the dialog.
3. Click **Activate Selected** to deactivate all subsequent branches.

   The button turns gray and all automation passes from the subsequent branches are undone. The automation passes of the activated branch are redone until the branch ends. For example, the first edits of a following branch are merged back into it.
4. To undo and delete a branch, click **Remove Inactive**.

   All branches are removed. The actions of the inactive branch disappear completely whereas the actions of the active branches are merged.

5. When you are done, click **Activate Automation Passes** to return to the regular Automation panel.

NOTE

The automation pass history is not saved with the project. If you close your project, the history is deleted.

Join Options

The Join options help you to resume write automation. This is useful, if several editors work on the same project simultaneously, and running automation passes are interrupted.

NOTE

The **Join** options are not available in **Touch** mode.

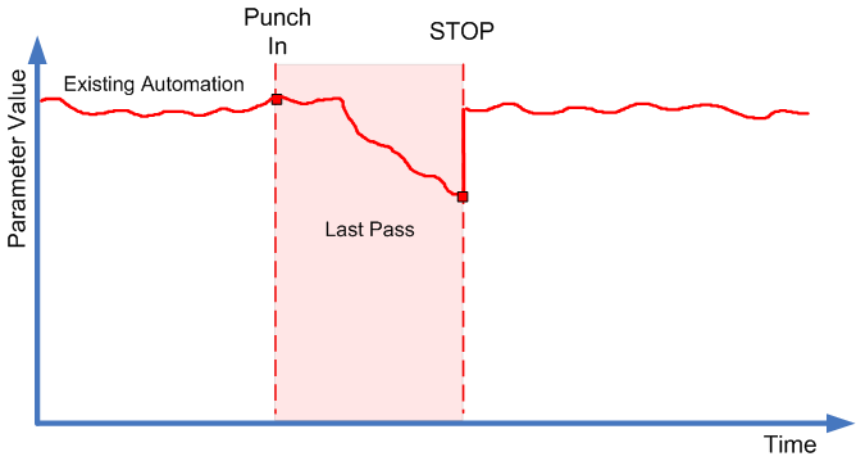
Activating Join Now

Join Now allows you to resume automation manually.

PROCEDURE

1. Start playback and watch the automation curve.
2. When the cursor reaches the desired position, click **Join Now**.

   All parameters from the last pass are punched in and the last value is written for the whole section. All previous automation events are overwritten.



Activating Auto Join

Auto Join allows you to resume automation automatically.

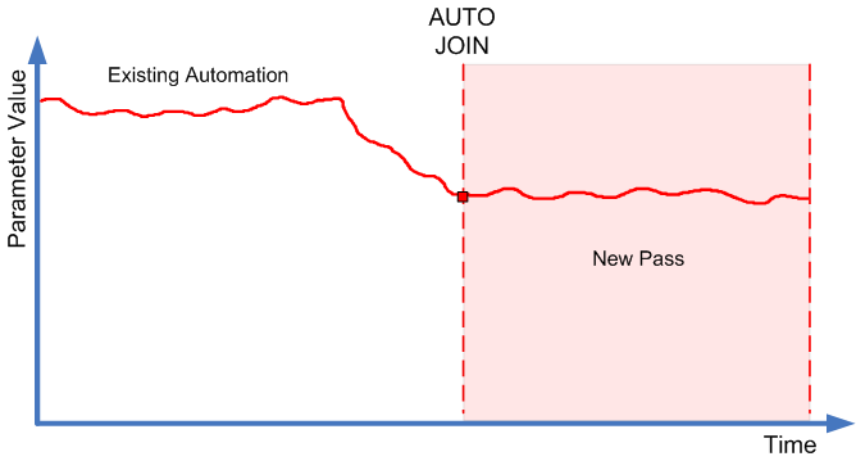
PROCEDURE

1. On the **Automation Panel**, activate **Auto Join**.
2. Start playback and watch the automation curve.

   All parameters from the last pass are punched in automatically at the position where you hit stop. The position is indicated by the Join indicator.

   NOTE

   The Join indicator shows the timecode position where the last automation pass was stopped, for example, the point where the Auto Join will automatically occur. When automation is resumed, this indicator is updated.



Fill Options

The **Fill** options define what happens in a specific section of your project when you punch out of a running automation pass.

The **Fill** options write one particular value across a defined section of your automation track. Any previously created data within this section is overwritten.

You can also combine the various **Fill** options.

Activating To Punch

PROCEDURE

1. On the Automation Panel, activate **Touch**, and activate **To Punch** as Fill option.
2. Start playback.

3. Move the fader until you have found the volume setting that you need and release the fader to punch out.

   The volume curve is set from the point of punch out back to where you punched in. The values written while moving the fader to find the right value are deleted, and the volume jumps at exactly the right moment from the value set in the first scene to the value found for the second scene.

Activating To Start

PROCEDURE

1. On the Automation Panel, activate **Touch**, and activate **To Start** as Fill option.
2. Start playback.
3. Move the fader until you have found the volume setting that you need and release the fader to punch out.

   The automation track is filled from where you punched out to the start of the project.

Activating To End

PROCEDURE

1. On the Automation Panel, activate **Touch**, and activate **To End** as Fill option.
2. Start playback and touch the parameter control to punch in the automation pass.
3. Move the fader until you have found the setting that you want and release it.

   This will punch out the writing of automation data. As you let go of the fader, the automation curve takes the found value setting, from where you punched out to the end of the project.

Activating Loop

PREREQUISITE

You have set up a loop range with the left and right locators.

PROCEDURE

1. On the Automation Panel, activate **Touch**, and activate **Loop** to activate it as Fill option.
2. Start playback.
3. Move the fader until you have found the volume setting that you need and release the fader to punch out.

   The found value is set within the range that is defined by the left and right locators.

Activating Gaps

PREREQUISITE

You have set up virgin territories.

NOTE

When **Trim** is active, **Gap** has no effect. This is because **Trim** only modifies already existing data.

PROCEDURE

1. On the Automation Panel, activate **Touch**, and activate **Gaps** to activate it as Fill option.
2. Start playback.
3. Move the fader until you have found the volume setting that you need and release the fader to punch out.

   Any gaps between previously written automation events is filled with the last value that was found during the last automation pass.

RELATED LINKS

Virgin Territory vs. Initial Value on page 666

One Shot vs Continuous Fill

You can use the **Fill** options in two different ways:

- **One shot**

  When you click one of the **Fill** buttons, it is highlighted, and will be enabled during the next automation pass. Afterwards, the option is disabled again.

- **Continuous fill**

  If you click a **Fill** button a second time, a lock symbol is displayed on the highlighted button, indicating that you are in continuous fill mode and that the operation can be repeated as many times as you want. Click the button a third time to disable the corresponding **Fill** option.

Drawing Fill Manually

You can use the **Fill** options on the Automation panel in combination with the **Draw** tool. This provides you with a powerful method for writing automation data manually.

PROCEDURE

1. Open an automation track and select the **Draw** tool.
2. On the **Automation Panel** select **To End** as a Fill option.
3. Click and draw to create an automation curve.

4. Release the mouse button.

   At the moment of release, a final automation event is created. The automation curve is written from this last event through to the end of the project.

   NOTE

   This procedure can be used with all the **Fill** options.

Preview Options

The **Preview** options allow you to find new settings without recording the steps needed to locate them.

This is useful if you want to audition changes on automation values without deleting any of the original automation data. When you have found the settings, you can punch the previewed value.

When changing a preset of a VST plug-in while in **Preview** mode, the change in the parameter settings caused by the preset change is recorded automatically as automation. Note that the plug-in must have 32 or less parameters for this to work.

Activating Preview

PROCEDURE

1. On the Automation Panel, in the **Preview** section, activate **Preview**.

   NOTE

   To set the Preview mode permanently, click the **Preview** button two times. A lock symbol is displayed on the highlighted button. You can disable this by clicking the button a third time.

2. Touch a parameter control.

   The **Suspend**, **Punch,** and **Punch on Play** options are displayed. You now have full manual control of the touch-collected parameter, and can suspend any previously recorded automation data.

3. Optional: Touch-collect another parameter, if you want to write data for several parameters during the same automation pass.
4. Play back the scene to find the parameter settings that you want.
5. Touch the required parameter, start playback, find the value, and activate **Punch** to start the new automation pass.
6. Optional: If you want to compare the value that was found during preview with previously automated values, activate the **Suspend** option.

   This plays back your audio material using the parameter values set before activating **Preview**. You can use the delta indicator in the automation track as an additional visual aid for comparing the values.

7. When you are happy with the values found, click the **Punch** button to start the new automation pass.

   The new value setting is recorded, from the point where you punched in to your punch out position as defined by the automation mode setting.

Punch vs. Punch on Play

When using the **Punch** option as described above, starting playback and punching in are two separate actions. If you want to punch in when starting playback, activate **Punch on Play**.

- Use **Punch on Play** when you cannot punch in on the fly, for example in situations where you need to find the punch in position in Stop mode. Once you have found the exact position, enable **Punch on Play** and start playback from there.
- **Punch** is the option to use if you need to listen to the section before your punch in point and if this section already contains automation data that you do not want to overwrite. Roll through this section and then punch in the automation pass.
- You can also use **Punch** in Stop mode. To create automation data in this way, **Punch** must be combined with one of the Fill modes.

Auto Punch

Auto Punch allows you to begin and end the automation pass at defined positions.

- Activate **Preview** mode and set the left and right locators at the positions where you want to automatically punch in and out.

Auto Punch allows you to set up a safe zone for previously written automation data.

- Place the right locator at the beginning of an area that you want to protect and enable cycle mode.

  This ensures that a running automation pass always punches out before reaching this section of your project.

Touch Assist

When you use Preview mode, you may get into a situation where you change some parameters, but not others, although they belong to the same group of parameters (for example EQ settings). **Touch Assist** allows you to prevent you from forgetting some parameters while touch-collecting parameters for Preview.

When **Touch Assist** is enabled, the parameters of the following features are treated as groups:

- Channel EQ module (21 parameters)
- Aux send on/off and send level

- Stereo panner
- Surround panner (Left-Right, Front-Rear, LFE)
- Insert plug-ins (only available for plug-ins with 32 or less parameters)

Touch Assist ensures that touching one parameter in a group will touch all other parameters in that group as well.

However, if you want to automate only one particular parameter, disable **Touch Assist** to prevent yourself from inadvertently overwriting any previously created automation data.

NOTE

Enabling **Touch Assist** may lead to the creation of a large amount of automation data, causing a higher CPU load. Only use **Touch Assist** if the performance is still acceptable.

Punch Log

The Punch Log section displays a list of the recent punch in operations that you performed in Preview mode. You can load one of these log entries for the current track to recall the corresponding touch-collected parameters and their values at the moment of punch in.

- To load an entry in the punch log, select it in the list and click **Load**.

  The **Preview** button on the Automation panel and on the corresponding automation track lights up.

  NOTE

  When loading a log entry, you add the corresponding parameters to any other parameters that you have touch-collected during the current Preview session. However, if you manually touch-collect the volume parameter, for example, and then add volume again by loading a punch log entry, the settings for volume from the punch log is used, replacing any values set manually.

- To rename any log, double-click it and enter a new name.
- To delete an entry, select it and click **Delete**.
- To specify how many log entries are displayed, use the **Max. Punch Logs** setting in the **Automation Settings** section.

  If this value is set to 10 entries, the eleventh punch event overwrites the entry created for the first event, the twelfth replaces the second entry, etc. The maximum possible number of punch log entries is 100.

- To prevent a particular entry from being overwritten, click in the right section for this entry, so that a checkmark is displayed.

Punch log entries are saved with the current project.

Punch log data is always project-specific. You cannot export log entries to another project.

Suspend Options

This section on the Automation Panel allows you to exclude specific parameters from the reading or writing of automation data. This way, you have full manual control of these parameters.

Suspend Read

Suspending Read for a specific parameter during automation gives you full manual control of it.

- To suspend the reading of automation data for a specific parameter, click the corresponding parameter.
- To suspend the reading of automation data for all parameters/parameter groups, click the **All** button.

NOTE

When any of the options in the Suspend Read category are enabled, clicking **All** will disable these buttons.

EXAMPLE

Imagine that you have already automated several tracks. While working on the current track, you want one of the other tracks to be louder, to better identify a particular position in your audio material.

By suspending Read for the Volume parameter, you regain full manual control and can set the volume to the required level.

Suspend Write

Suspending Write for a specific parameter during automation punches this parameter out of the automation pass.

- To suspend the writing of automation data for a specific parameter, click the corresponding parameter.

- To suspend the writing of automation data for all parameters/parameter groups, click the **All** button.

  NOTE

  When any of the options in the Suspend Write category are enabled, clicking **All** will disable these buttons.

EXAMPLE

Imagine the following situation: To help you concentrate while working on a particular track, you mute several other tracks. However, because write automations are active on these tracks, this mute state is also automated during the next automation pass – a classic situation in mixing.

To avoid inadvertently excluding whole tracks from your mix in this way, you can exclude Mute from all automation writing. Simply click **Mute** in the Suspend Write category on the Automation panel.

Show Options

The Show options allow you to open all automation tracks for a specific parameter. This gives you an overview of the automated parameter.

- To open the volume, pan, EQ, sends, or inserts automation tracks for all tracks, click the corresponding parameter.

  The automation tracks are opened even if no automation data was recorded on these tracks.

- To step through the individual parameter sets of parameter groups, for example Pan, EQ, Sends, and Inserts, click the respective button repeatedly.
- To show only the automation tracks for which automation data has already been written, activate **Used Only** and click one of the options.
- To show all automation tracks that contain automation data, activate **Show Used**.
- To hide all open automation tracks, activate **Hide All**.

NOTE

The Show options on the Automation panel affect all tracks.

Automation Settings

To set up specific automation preferences, click the button in the bottom left of the Automation panel.

Use Undo Branches

Activate this to gather automation passes in branches.

Show Data on Tracks

Activate this to show audio waveforms or MIDI events on automation tracks.

The events are displayed only if **Show waveforms** (**File > Preferences > Event Display > Audio**) is enabled and if **Part Data Mode** (**File > Preferences > Event Display > MIDI**) is set to an option other than **No data**.

Use Virgin Territory

Activate this if you want to use virgin territories.

Continue Writing

If you activate this option, the recording of automation will not be blocked when locating to a new position. This can be used to perform multiple automation passes in Cycle mode or if you are using the arranger functions.

If this option is deactivated and you write automation data and locate to another position in the project, the writing will be stopped until the mouse button is released or until a Stop command is received.

Reveal Parameter on Write

If you activate this option, the corresponding automation track is revealed on writing automation parameters. This is useful if you want to have a visual control of all parameters changed on writing.

Return Time

This determines how fast the automated parameter returns to any previously automated value when you release the mouse button. Set this to a value higher than 0 to prevent sudden jumps in your parameter settings which may lead to crackles.

Reduction Level

Punching out or using the **Reduce Automation Events** function removes all superfluous automation events. This results in an automation curve that contains only the events necessary to reproduce your actions. A reduction level value of 0% removes repeated automation points only. A reduction level value between 1 to 100% smoothens the automation curve. The default value of 50% should reduce the automation data amount significantly without touching the sound result of the existing automation.

Spike Detection Range

Defines a period of time in which sudden changes in the automated parameter are considered to be unwanted spikes. The spikes can be removed using the **Delete Automation Spikes** function. You can set values from 0 to 200 ms.

Max Punch Logs

This specifies how many log entries are displayed. You can set values from 5 to 100.

Freeze Trim

In this pop-up menu, you can specify how to freeze your trim curve.

- To freeze your trim curve manually, select **Manually**.
- To perform a freeze whenever a write operation is finished, select **On Pass End**.
- If you want the trim data to freeze automatically when the trim mode is switched off (globally or individually for a track), select **On Leaving Trim Mode**.

RELATED LINKS

Automation Passes on page 675
Virgin Territory vs. Initial Value on page 666
Punch Log on page 683

MIDI Controller Automation

When working with Nuendo, it is possible to record automation data for MIDI controllers in two places: as MIDI part data and as data on an automation track.

If you have such conflicting automation data, you can specify separately for every parameter how these will be combined during playback. This is done by selecting an Automation Merge Mode in the track list for the automation track.

Automation Merge Modes

This pop-up menu is only available for controllers that can be recorded both for a part and a track. The settings that you make for a controller are applied to all MIDI tracks that use this controller.

Use Global Settings

When this is selected, the automation track uses the global Automation Merge Mode that is specified in the **MIDI Controller Automation Setup** dialog.

Replace 1 - Part Range

When this option is selected, the part data has playback priority over the automation track data, for example at the left and right part borders, the automation mode switches abruptly from part to track automation, and vice versa.

Replace 2 - Last Value Continues

Similar to the above, but part automation only begins when the first controller event within the part is reached. At the end of the part, the last controller value is kept until an automation event is reached on the automation track.

Average

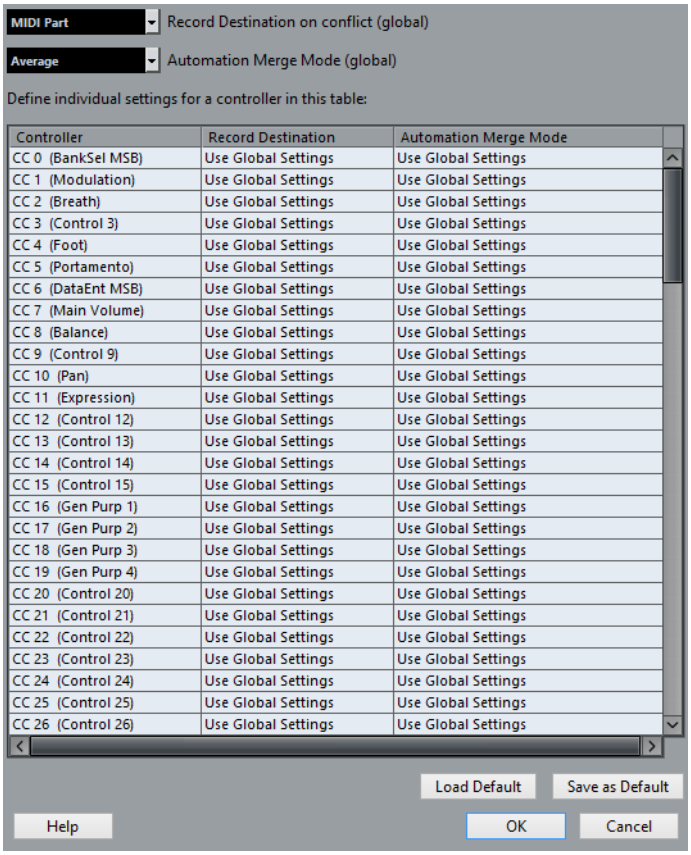
When this option is selected, the average values between part and track automation is used.

Modulation

In this mode, the automation track curve modulates the existing part automation, with higher curve points emphasizing the automation values and lower curve points reducing the automation values even further.

MIDI Controller Automation Setup

In the **MIDI Controller Automation Setup** dialog, you can specify how existing MIDI automation is handled on playback and new automation data is recorded in a MIDI part or as track automation. All settings that you make in this dialog are saved with the project.



Record Destination on conflict (global)

Allows you to determine which destination is used if MIDI controller data is received by Nuendo and both the **Record** and the **Write Automation** buttons are enabled. Select **MIDI Part** to record MIDI part automation. Select **Automation Track** to record the controller data on an automation track in the Project window.

Automation Merge Mode (global)

Allows you to specify the global Automation Merge Mode.

Controller list

Lists all MIDI controllers for which you can specify the record destination and the Automation Merge Mode separately. This gives you full control over the MIDI automation (destination as well as merge mode) in your project.

Record Destination

Click in the **Record Destination** column for a MIDI controller to open the pop-up menu where you can choose where you want recorded data of this particular MIDI Controller to end up.

Automation Merge Mode

Click in the **Automation Merge Mode** column for a MIDI controller to specify what happens with data for this specific controller on playback.

Save As Default

Allows you to save the current settings as default settings. When you create a new project, the default settings is used.

Load Default

Allows you to load the default settings.

VST Instruments

VST instruments are software synthesizers or other sound sources that are contained within Nuendo. They are played internally via MIDI. You can add effects or EQ to VST instruments.

Nuendo allows you to make use of VST instruments in the following ways:

- By adding an instrument in the **VST Instruments** window.

  This creates a VST instrument channel, which can be played by one or several MIDI tracks routed to it.

- By creating an instrument track.

  This is a combination of a VST instrument, an instrument channel, and a MIDI track. You play and record MIDI note data directly for this track.

NOTE

Some VST instruments are included with Nuendo. These are described in the separate PDF document Plug-in Reference.

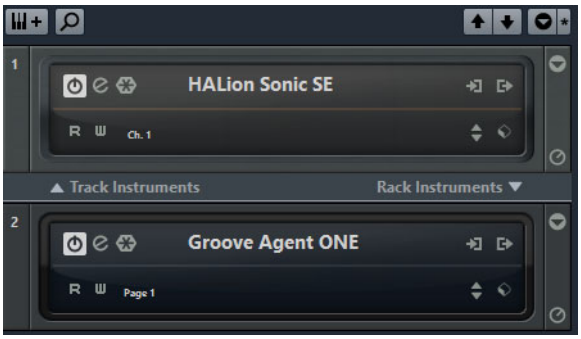
IMPORTANT

VST instruments are only supplied as part of the Nuendo Expansion Kit. You can, however, use your own VST instruments in Nuendo.

VST Instruments Window

The **VST Instruments** window allows you to add VST instruments for MIDI and instrument tracks, giving you an overview of all instruments used in a project. It also offers you access to 8 quick controls for each added instrument.

To open the **VST Instruments** window, select **Devices > VST Instruments**.



The following controls can be found in the **VST Instruments** window:

1) **Add Track Instrument**

   Opens the **Add Instrument Track** dialog that allows you to select an instrument and add an instrument track that is associated to this instrument.

2) **Find Instruments**

   Opens a selector that allows you to find an instrument in the **VST Instruments** window.

3) **Set Remote-Control Focus for VST Quick Controls to Previous/Next Instrument**

   Shows and activates the quick controls for the next/previous instrument in the **VST Instruments** window.

4) **Show/Hide all VST Quick Controls**

   Shows/Hides the default quick controls for all loaded instruments.

5) **Settings**

   Opens the **Settings** menu, where you can activate/deactivate the following modes:

   Show VST Quick Controls for One Slot Only shows the VST Quick Controls exclusively for the selected instrument.

   MIDI Channel follows track selection ensures that the **Channel** selector follows the MIDI track selection in the **Project** window. Use this if you work with multitimbral instruments.

   Remote-Control Focus for VST Quick Controls follows track selection ensures that the VST Quick Control remote-control focus follows the track selection.

The following controls are available on each instrument:

1) **Activate Instrument**

Activates/Deactivates the instrument.

2) **Edit Instrument**

Opens the instrument panel.

3) **Freeze Instrument**

Freezes the instrument. This allows you to save CPU power.

4) **Instrument Selector**

Allows you to select another instrument. Double-click to rename the instrument. The name is shown in the **VST Instruments** window in the **Output Routing** pop-up menu for MIDI tracks. This is useful when you work with several instances of the same instrument.

5) **Input Options**

This lights up when MIDI data is received by the instrument. Click this button to open a pop-up menu that allows you to select, mute/unmute, and solo/unsolo for tracks that send MIDI to the instrument (inputs).

6) **Activate Outputs**

Allows you to activate one or more outputs for the instrument.

7) **Preset Browser**

Allows you to load or save an instrument preset.

8) **Load Previous/Next Program**

Allows you to load the previous/next program.

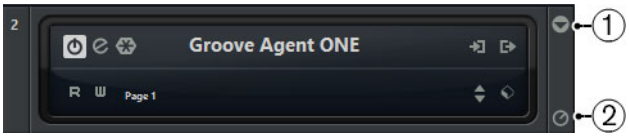
9) **Select Quick Control Layer**

Allows you to select a program.

10) **Read/Write Automation**

Allows you to read/write automation for the instrument parameter settings.

The following controls are available on each rack:



1) **Show/Hide VST Quick Controls**
   Allows you to show/hide the VST Quick Controls for the instrument.

2) **Set Remote-Control Focus for VST Quick Controls**
   Allows you to activate the VST Quick Controls to remote-control the instrument.

VST Instruments Window Context Menu

The following functions are available in the **VST Instruments** window context menu:

Always on Top

If this option is activated, the **VST Instruments** window is always on top.

Add Track Instrument

Opens the **Add Instrument Track** dialog that allows you to select an instrument and add an instrument track that is associated to this instrument.

Add Rack Instrument

Opens a selector that allows you to add a VST instrument.

Instruments Context Menu

The following functions are available in the instruments context menu:

Copy/Paste instrument Setting

Allows you to copy the instrument settings and paste them to another instrument.

Load/Save Preset

Allows you to load/save an instrument preset.

Default Preset

Allows you to define and save a default preset.

Switch to B Setting

Activates the setting B.

Copy A to B

Copies the effect parameters of effect setting A to effect setting B.

Activate Outputs

Allows you to activate one or more outputs for the instrument.

Remote Control Editor

Opens the **Remote Control Editor**.

Adding VST Instruments

PROCEDURE

1. On the **Devices** menu, select **VST Instruments**.
2. Right-click on an empty area of the **VST Instruments** window.
3. From the context menu, select one of the following:
   - **Add Track Instrument**
   - **Add Rack Instrument**
4. From the instrument selector, select an instrument.
   - Click **Add Track**, if you chose to add a track instrument.
   - Click **Create**, if you chose to add a rack instrument.

RESULT

If you chose **Add Track Instrument**, the instrument control panel opens, and an instrument track with the name of the instrument is added to your project.

If you chose **Add Rack Instrument**, the instrument control panel opens, and the following tracks are added to the track list:

- A MIDI track with the name of the instrument. The output of the MIDI track is routed to the instrument.

  NOTE

  In the **Preferences** dialog (**VST–Plug-ins** page), you can specify what happens when you load a VST instrument.

- A folder with the name of the instrument that is added within a **VST Instruments** folder. The instrument folder contains two automation tracks: one for the plug-in parameters, and one for the synth channel in the **MixConsole**.

Presets for Instruments

You can load and save presets for instruments. These contain all the settings that are required for the sound that you want.

The following presets for instruments are available:

- **VST presets** include the parameter settings of a VST instrument.

  These are available from the **VST instruments** window, from the instrument control panels, and from the **Programs** field in the Inspector.

- **Track presets** include the instrument track settings and the settings for the corresponding VST instrument.

  These are available from the Inspector or the track list context menu.

Loading VST Presets

You can load **VST presets** from the **VST instruments** window, from the instrument panel, or from the Inspector.

PROCEDURE

1. Do one of the following:
   - Select the track that contains the VST instrument and in the **Inspector**, click the **Programs** field.
   - In the **VST Instruments** window, click the **Preset Browse**r button for the instrument, and select **Load Preset**.
   - In the control panel for the VST instrument, click the **Preset Browser** button, and select **Load Preset**.
2. In the preset browser, select a preset from the list and double-click it to load it.

RESULT

The preset is applied. To return to the previously loaded preset, open the preset browser again and click **Revert to Last Setting**.

Saving VST Presets

You can save your settings on VST instruments as VST presets for further use.

PROCEDURE

1. Do one of the following:
   - In the **VST Instruments** window, click the **Preset Browse**r button for the instrument, and select **Save Preset**.
   - In the control panel for the VST instrument, click the **Preset Browser** button, and select **Save Preset**.
2. In the **Save <VST instrument name> Preset** dialog, enter a name for the preset.
3. Optional: Click **Show Attribute Inspector** and define attributes for the preset.
4. Click **OK** to save the preset and close the dialog.

Loading Track Presets

You can load track presets for instrument tracks from the Inspector.

PROCEDURE

1. Do one of the following:
   - Select the instrument track and in the Inspector, click the **Load Track Preset** field.
   - Right-click the instrument track and from the context menu, select **Load Track Preset**.
2. In the preset browser, select a preset from the list and double-click it to load it.

RESULT

The track preset is applied. To return to the previously loaded preset, open the preset browser again and click **Revert to Last Setting**.

Saving Track Presets

You can save your settings on instrument tracks as Track presets for further use.

PROCEDURE

1. Do one of the following:
   - Select the instrument track and in the Inspector, click the **Save Track Preset** button.
   - Right-click the instrument track and from the context menu, select **Save Track Preset**.
2. In the **Save Track Preset** dialog, enter a name for the preset.
3. Optional: Click **Show Attribute Inspector** and define attributes for the preset.
4. Click **OK** to save the preset and close the dialog.

VST Quick Controls

VST Quick Controls allow you to remote-control a VST instrument from within the **VST Instruments** window.

To show the VST Quick Controls on the **VST Instruments** window, activate the **Show/Hide all VST Quick Controls** button.

Connecting Quick Controls with Remote Controllers

Quick Controls become powerful when used in combination with a remote controller.

PREREQUISITE

Your remote device is connected to Nuendo via MIDI.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Devices** list, select **Track Quick Controls** or **VST Quick Controls**.

   This opens the respective section on the right.
3. From the **MIDI Input** pop-up menu, select the MIDI port on your computer.

   If your remote controller has its own MIDI input and supports MIDI feedback, you can connect your computer to the device input. Select the corresponding MIDI port in the **MIDI Output** pop-up menu.

   Alternatively, you can select **All MIDI Inputs**.
4. Click **Apply**.
5. Activate **Learn**.
6. In the **Control Name** column, select **QuickControl 1**.
7. On your remote control device, move the control that you want to use for the first quick control.
8. Select the next slot in the **Control Name** column and repeat the previous steps.
9. Click **OK**.

   NOTE

   In addition to using the Learn function to set up the table in the **Quick Controls** section, you can modify the values manually. The available options are identical to the ones available for the Generic Remote device.

RESULT

The quick controls are now associated with control elements on your external remote controller. If you move a control element, the value of the parameter that is assigned to the corresponding Quick Control changes accordingly.

The remote controller setup for Quick Controls is saved globally, that is, it is independent of any projects. If you have various remote controllers, you can save and load several Quick Control setups using the **Export** and **Import** buttons.

RELATED LINKS

The Generic Remote device on page 722

Activating Pick-up Mode for Hardware Controls

Pick-up Mode allows you to change configured Quick Control parameters without accidentally modifying their previous values.

Often, the parameter settings of your Quick Controls are initially different from the settings of your hardware controls, for example, when the hardware controls control, different Quick Controls on different tracks. In this case, you will notice that moving a hardware control changes the previous value of a parameter in a way that it is initially set to the zero position, before it is changed. Thus, you always lose your previous setting of the parameter.

To avoid this, you can activate **Pick-up Mode**. This has the effect that when you move your hardware control, you can only change the parameter once the control reaches the parameter's previous value. The control "picks up" the parameter at the value to which it was last set.

NOTE

This only applies to hardware controllers whose controls use specific ranges.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Devices** list, select **Track Quick Controls** or **VST Quick Controls**.
3. Activate **Pick-up Mode**.
4. Click **OK**.

Playing Back VST Instruments

After you have added a VST instrument and selected a sound, you can play back the VST instrument using the instrument or MIDI track in your project.

PROCEDURE

1. In the track list, activate the **Monitor** button for the track that has the VST instrument loaded.
2. Press one or more keys on your MIDI keyboard or use the virtual keyboard.

   The corresponding sounds are triggered on your VST instrument.
3. Select **Devices > MixConsole** to open the **MixConsole** and adjust the sound, add EQ or effects, assign another output routing, etc.

VST Instruments and Processor Load

VST instruments can consume a lot of CPU power. The more instruments you add, the more likely you will run out of processor power during playback.

If the CPU overload indicator in the **VST Performance** window lights up or you get crackling sounds, you have the following options:

- Activate **Freeze** for instruments.

  This renders the instrument into an audio file and unloads it.

- Activate **Suspend VST3 plug-in processing when no audio signals are received** for VST 3 instruments.

  This ensures that your instruments do not consume CPU power on silent passages.

RELATED LINKS

Freezing Instruments on page 699
Suspend VST3 plug-in processing when no audio signals are received on page 1282

Freezing Instruments

If you are using a moderately powerful computer or a large number of VST instruments, your computer may not be able to play back all instruments in realtime. At this point, you can freeze instruments.

PROCEDURE

1. Do one of the following:
   - Select **Devices > VST Instruments**.
   - Select the instrument track and open the top **Inspector** tab.
2. Click the **Freeze** button.
3. In the **Freeze Instrument Options** dialog, make your settings.
4. Click **OK**.

RESULT

- The instrument is rendered to an audio file and on playback you hear the same sound as before freezing.
- Less CPU load is used.
- The **Freeze** button lights up.
- The MIDI/instrument track controls are grayed out.
- The MIDI parts are locked.

NOTE

To edit the tracks, parameters, or synth channels again, and to delete the rendered file, unfreeze the instrument by clicking the **Freeze** button again.

Freeze Instrument Options

The **Freeze Instrument Options** dialog opens when you click the **Freeze** button. It allows you to specify exactly what should happen, if you freeze an instrument.

The following controls can be found in the **Freeze Instrument Options** dialog:

Freeze Instrument Only

Activate this option if you still want to be able to edit insert effects on the synth channel after freezing the instrument.

Freeze Instrument and Channels

Activate this option if you do not need to edit the insert effects on your synth channels.

NOTE

You can still adjust level, pan, sends, and EQ.

Tail Size

Allows you to set a Tail Size time to let sounds complete their normal release cycle.

Unload Instrument when Frozen

Activate to unload the instrument after freezing. This makes the RAM available again.

About Latency

The term latency stands for the time it takes for the instrument to produce a sound when you press a key on your MIDI controller. It can be an issue when using VST instruments in realtime. Latency depends on your audio hardware and its ASIO driver.

In the **Device Setup** dialog (**VST Audio System** page), the input and output latency values should ideally be a few milliseconds.

If the latency is too high to allow comfortable realtime VST instrument playback from a keyboard, you can use another MIDI sound source for live playback and recording, and switch to the VST instrument for playback.

RELATED LINKS

Selecting a Driver on page 14

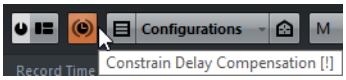
Delay Compensation

During playback Nuendo automatically compensates any delay inherent in the VST plug-ins you use.

You can specify a Delay Compensation Threshold in the **Preferences** dialog (**VST** page) so that only plug-ins with a delay higher than this threshold setting are affected.

Constrain Delay Compensation

To avoid Nuendo to add latency when you play a VST instrument in realtime or record live audio, you can activate **Constrain Delay Compensation**. This minimizes the latency effects of the delay compensation, while maintaining the sound of the mix as far as possible.



The Constrain Delay Compensation function is available on the toolbar and in the **MixConsole** on the **Functions** menu.

Activating **Constrain Delay Compensation** turns off VST plug-ins which are activated for VST instrument channels, audio track channels that are record enabled, group channels, and output channels. VST plug-ins which are activated for FX channels are disregarded. After recording or using a VST instrument **Constrain Delay Compensation** should be deactivated again in order to restore full delay compensation.

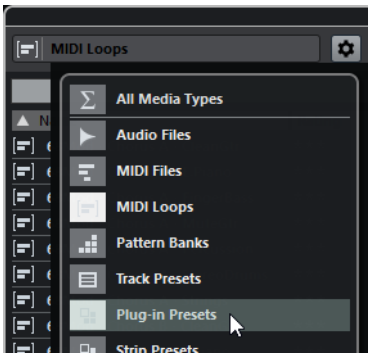
Import and Export Options

Importing MIDI Loops

You can import MIDI loops (file extension .midiloop) in Nuendo. These files contain MIDI part information (MIDI notes, controllers, etc.) and all the settings that are saved in instrument track presets. This way, you can reuse instrument patterns in other projects or applications, for example.

PROCEDURE

1. Select **Media > MediaBay**.
2. Optional: In the **Results** section, open the **Select Media Types** menu, and activate **MIDI Loops** and **Plug-in Presets**.



3. In the results list, select a MIDI loop and drag it to an empty section in the **Project** window.

RESULT

An instrument track is created and the instrument part is inserted at the position where you dragged the file. The **Inspector** reflects all settings that are saved in the MIDI loop, for example, the VST instrument that was used, applied insert effects, track parameters, etc.

NOTE

You can also drag MIDI loops onto existing instrument or MIDI tracks. However, this only imports the part information. This means this part only contains the MIDI data (notes, controllers) that is saved in the MIDI loop, but no inspector settings or instrument parameters.

RELATED LINKS

Presets for Instruments on page 694
Filtering According to Media Type on page 606

Exporting MIDI Loops

You can export MIDI loops to save a MIDI part together with its instrument and effect settings. This allows you to reproduce patterns that you created without having to search for the correct sound, style, or effect.

PROCEDURE

1. Select an instrument part.
2. Select **File > Export > MIDI Loop**.

   A file dialog opens.
3. In the **New MIDI Loop** section, enter a name for the MIDI loop.
4. Optional: To save attributes for the MIDI loop, click the button below the **New MIDI Loop** section at the bottom left.

   The **Attribute Inspector** section opens, allowing you to define attributes for your MIDI loop.
5. Click **OK** to close the dialog and save the MIDI loop.

RESULT

MIDI Loop files are saved in the following folder:

Windows: `\Users\<user name>\AppData\Roaming\Steinberg\MIDI Loops`

Mac: `/Users/<user name>/Library/Application Support/Steinberg/MIDI Loops/`

The default folder cannot be changed. However, you can create subfolders within this folder to organize your MIDI loops. To create a subfolder, click the **New Folder** button in the **Save MIDI Loop** dialog.

Exporting Instrument Tracks as MIDI File

You can export instrument tracks as standard MIDI files.

NOTE

- As there is no MIDI patch information in an instrument track, this information is missing in the resulting MIDI file.
- If you activate **Export Inspector Volume/Pan**, volume and pan information of the VST instrument are converted and written into the MIDI file as controller data.

RELATED LINKS

Exporting MIDI files on page 1203

External Instruments

An external instrument bus is an input (return) to your audio hardware, along with a MIDI connection via Nuendo and few additional settings. External instrument busses are created in the **VST Connections** window. All external instrument busses that you have created will appear on the **VST Instrument** pop-up menus and can be selected in the same way as any VST instrument plug-in.

If you select an external instrument, you play it via MIDI as usual (you have to create a MIDI device to play it) and the sound (synth audio output) will come in to the VST environment where you can apply processing, etc.

RELATED LINKS

Setting Up External Instruments on page 37

Installing and Managing Plug-ins

Installing VST plug-ins

Nuendo supports the VST 2 and VST 3 plug-in standards. You can install effects and instruments that comply with these formats.

A plug-in is a piece of software that adds a specific functionality to Nuendo. The audio effects and instruments that are used in Nuendo are VST plug-ins.

NOTE

If an effect or instrument plug-in has its own installation application, you should use this. Dragging an already installed plug-in to a different location may lead to problems. As a general rule, always read the documentation or readme files before installing new plug-ins.

Nuendo comes with a number of effect plug-ins included. These effects and their parameters are described in the separate PDF document Plug-in Reference.

Installing VST 3 Plug-ins on Mac OS X Systems

To install a VST 3.x plug-in on a Mac OS X system, quit Nuendo and drag the plug-in file into one of the following folders:

- `/Library/Audio/Plug-Ins/VST3/`

  This is only possible if you are the system administrator. Plug-ins that are installed in this folder are available to all users, for all programs that support VST 3.

- `/Users/<user name>/Library/Audio/Plug-Ins/VST3/`

  <user name> is the name you use to log on to the computer. The easiest way to open this folder is to open your `Home` folder and use the path `/Library/Audio/Plug-Ins/VST3/` from there. Plug-ins that are installed in this folder are only available to you.

When you scan for newly installed plug-ins, or relaunch Nuendo, the new effects appear on the effect selectors. In the VST 3 protocol, the effect category, subfolder structure, etc. are built-in and cannot be changed. Therefore, you find the effects in the corresponding category folders.

Installing VST 2 Plug-ins on Mac OS X Systems

To install a VST 2.x plug-in on Mac OS X systems, quit Nuendo and drag the plug-in file to one of the following folders:

- `Library/Audio/Plug-Ins/VST/`

  This is only possible if you are the system administrator. Plug-ins that are installed in this folder are available to all users, for all programs that support VST 2.x.

- `user name>/Library/Audio/Plug-Ins/VST/`

  <user name> is the name you use to log on to the computer. The easiest way to open this folder is to go to your `Home` folder and use the path `/Library/Audio/Plug-Ins/VST/` from there. Plug-ins that are installed in this folder are only available to you.

When you scan for newly installed plug-ins, or relaunch Nuendo, the new effects appear on the effect selectors.

Installing VST 3 Plug-ins on Windows Systems

On Windows systems, VST 3 plug-ins are installed by dragging the files with the extension .vst3 into the `VST3` folder in the Nuendo application folder. When you scan for newly installed plug-ins, or relaunch Nuendo, the new effects appear on the effect selectors. In the VST 3 protocol, the effect category, subfolder structure, etc. are built-in and cannot be changed. Therefore, you find the new effects in the corresponding category folders.

Installing VST 2 Plug-ins on Windows Systems

On Windows systems, VST 2.x plug-ins are installed by dragging the files with the extension .dll into the `Vstplugins` folder in the Nuendo application folder, or into the `Shared VST Plug-ins` folder (Windows 32 bit only). When you scan for newly installed plug-ins, or relaunch Nuendo, the new effects appear on the effect selectors.

Plug-in Manager

The **Plug-in Manager** provides lists of the effects and VST instruments that are installed on your computer. These lists are used in the selectors for VST instruments and effects.

The **Plug-in Manager** allows you to do the following:

- You can view lists of all effects and VST instruments that are loaded by Nuendo when you launch the program.

The lists of all effects or VST instruments are created automatically every time you start Nuendo. You can also initiate a rescan at any time. This ensures that these lists are always up-to-date.

- You can create your own lists of effects or instruments for use in the selectors for effects or instruments. User-defined lists are called collections.

  Collections allow you to create sub-sets of the available effects or instruments, for example, to give you a better overview of the effects used in a project.

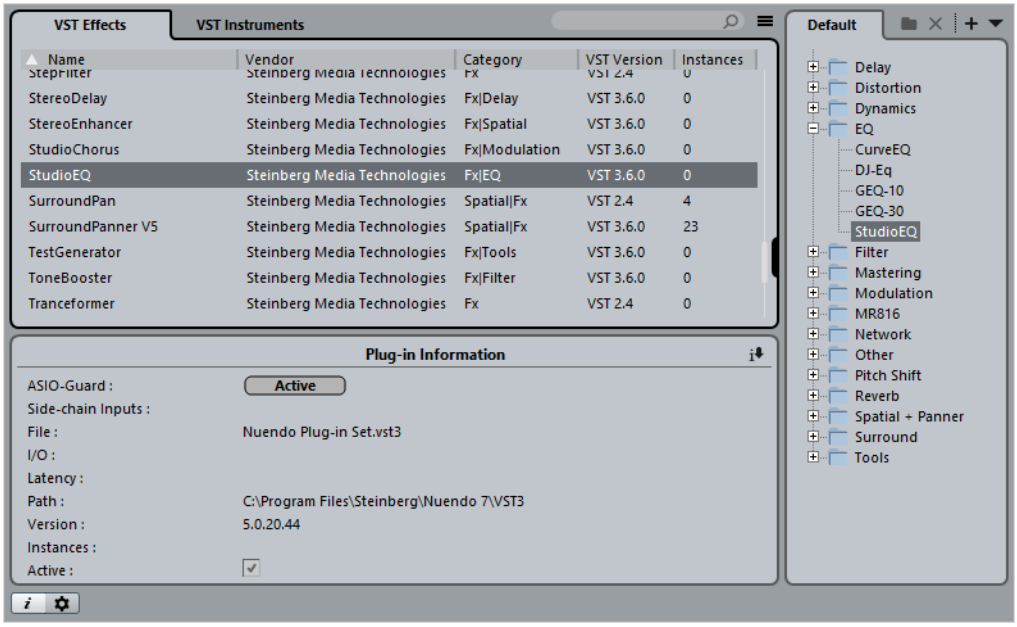
NOTE

If an installed effect or instrument cannot be loaded by Nuendo, it does not appear in the list of all effects or instruments. Also, the effect or instrument is grayed out in any collections in which it is included. For example, this can happen if a copy-protection dongle required to run the effect or instrument is missing, or after deinstallation of a plug-in.

Plug-in Manager Window

You can manage your effects and VST instruments in the **Plug-in Manager** window.

- To open the **Plug-in Manager** window, select **Devices > Plug-in Manager**.



The **Plug-in Manager** window shows the following:

VST Effects/VST Instruments

Open these tabs to see lists of all VST effects and VST instruments that were loaded by Nuendo when you launched the program.

Collection list

By default, the window section to the right shows the **Default** collection, which contains all effects or VST instruments currently loaded by the program. The **Default** collection cannot be changed.

You can compile your own collections of effects or VST instruments by clicking **New Collection** and dragging and dropping items from the list of all effects or VST instruments to the collection list.

Collections are shown in the selectors for effects/VST instruments, and all changes made to collections in the **Plug-in Manager** are immediately reflected in the selectors.

Enter the name of a plug-in in the search field. The list of all effects or VST instruments is filtered to show only those plug-ins whose names contain the text that you entered.

The **Toggle list to show all/show only FX/VSTi not in current collection** button allows you to filter the lists of all effects or VST instruments to show either all loaded plug-ins, or only those that are not part of the current collection.

The **New Folder** button allows you to create a new folder in the current collection.

The **Delete** button allows you to delete the selected item in the current collection.

The **New Collection** button allows you to create a new collection.

To create a new, empty list, select **Empty**. To create a new collection based on the list of all effect, select **Add All Plug-ins**. To create a new collection based on the current collection, select **Add Current Collection**.

The **User Collections** drop-down menu allows you to select a different collection, and to rename or delete the current collection.

To remove unavailable plug-ins from all collections, select **Remove Unavailable Plug-ins from All Collections**.

The **Show Plug-in Information** button opens a section at the bottom of the window in which more information about the selected item is shown. If you select several plug-ins, the information for the plug-in that you have selected first is shown. In this section, you can also deactivate selected plug-ins. Deactivated plug-ins are no longer available in collections. This is useful if you have plug-ins installed that you do not want to use in Nuendo.

The **Plug-in Manager Settings** button opens a section at the bottom of the window in which all current paths to VST 2 plug-ins are listed. You can add or remove folder locations by using the corresponding buttons. Click **Rescan All** to rescan your computer for plug-ins.

RELATED LINKS

Plug-in Manager on page 705

Compiling a New Effects Collection

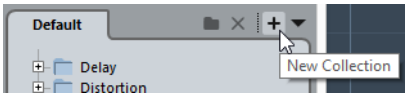
You can create a new collection of effects or VST instruments for use in the plug-in selectors.

PREREQUISITE

A number of effect plug-ins is correctly installed on your computer, and these plug-ins are listed on the **VST Effects** tab of the **Plug-in Manager** window.

PROCEDURE

1. In the **Plug-in Manager** window, click the **New Collection** button and do one of the following:
   - To create a new collection based on the list of all effects, select **Add All Plug-ins**.
   - To create a new collection based on the current collection, select **Copy Current Collection**.



2. Enter a name for the new collection and click **OK**.
3. Drag items from the list of all effects and drop them to the new collection. A blue line indicates the drop position.
   - Click the **New Folder** button to create folders and place items directly in them.
   - You can drag items to new positions within the collection.
   - Drag items from the collection list to the list of all plug-ins to delete them, or select items and click **Delete**.

RESULT

The new collection is saved automatically.

The procedure is the same for compiling collections of VST instruments.

In the plug-in selectors, found, for example, in the **Project window > track inspector > Inserts** tab, collections are available as tabs at the top of the selector.

Track Quick Controls

Nuendo can give you instant access to up to 8 different parameters, for example, track, effect, or instrument controls. This is done with the aid of the Quick Controls, set up on the **Quick Controls** tab in the Inspector for the corresponding track.

The **Quick Controls** tab can be used as a kind of track control center, an area in which your most important parameters are assembled in one place. This saves you from having to click your way through the various windows and sections pertaining to your track.

Nuendo also allows you to assign these Quick Controls very quickly to an external remote control device. This does not only give you manual control of your most important track parameters, but also allows you to conveniently use an external MIDI device such as a foot controller to control effect parameters.

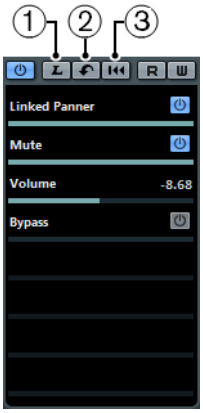
- Quick Control assignments are saved with the current project.
- Since Quick Control settings are part of the track setup, you can save them as track presets, allowing you to re-use your settings across different projects.
- You can automate the parameter settings on the **Quick Controls** tab using the Read/Write buttons (R and W).
- You can also assign parameters to Quick Controls in the MixConsole.

RELATED LINKS

Track Presets on page 167
Automation on page 658
Channel Racks on page 360

Assigning Parameters to Quick Controls

The Quick Controls tab shows eight slots, one for each quick control. To start with, these slots are empty. Parameters can be assigned manually or retrieved automatically.



1) QC Learn Mode
2) Get default QCs from Plug-in
3) Remove all QC Assignments

Assignment via the Learn Function

Using the **QC Learn Mode** button on the **Quick Controls** tab in the Inspector, you can assign a parameter by moving the corresponding control.

This procedure applies to all automatable controls.

PROCEDURE

1. In the **Inspector** for your track, open the **Quick Controls** tab.
2. Activate **QC Learn Mode**.
3. Select the slot to which you want to assign a parameter.
4. Use the desired control.

Assignment via Plug-in Panels

You can assign effect parameters to Quick Control slots directly from within plug-in panels.

You can assign an effect parameter either to the next empty slot or to a specific Quick Control slot.

NOTE

These options are only available for VST 3 plug-ins that support this function.

PROCEDURE

- Right-click the parameter.
  - To assign the parameter to the next empty slot, select **Add “x” to Quick Controls** (where x is the name of the parameter).
  - To assign the parameter to a specific slot, select **Add “x” to Quick Controls Slot** (where x is the name of the parameter). Then select the slot from the submenu.

Assigning Parameters from Racks or Channel Settings

You can assign several parameters to Quick Control slots directly from within racks or channel settings in the **MixConsole**.

Some specific racks and channel settings allow you to add several parameters directly to the **Quick Controls** tab in the Inspector.

- Pre (Filters/Gain/Phase)
- Equalizers
- Channel Strip

You can assign an effect parameter either to the next empty slot or to a specific Quick Control slot.

NOTE

These options are only available for VST 3 plug-ins that support this function.

PROCEDURE

- Right-click the parameter.
  - To assign the parameter to the next empty slot, select **Add “x” to Quick Controls** (where x is the name of the parameter).
  - To assign the parameter to a specific slot, select **Add “x” to Quick Controls Slot** (where x is the name of the parameter). Then select the slot from the submenu.

RELATED LINKS

Track Quick Controls on page 709

Manual Assignment via the Inspector Tab

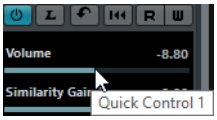
You can assign track parameters manually.

PROCEDURE

1. In the **Inspector** for your track, open the **Quick Controls** tab.
2. On the **Quick Controls** tab, click on the first Quick Control slot.

   A pop-up menu opens. It lists all parameters currently accessible for this particular track.
3. Double-click the parameter that you want to assign to the first Quick Control slot.

   The parameter name and its value are displayed in the slot. You can change the value by dragging the slider.

   The track's main volume parameter is assigned to Quick Control 1.
4. Repeat these steps for each Quick Control slot until all slots are associated with track parameters.

RESULT

You can now control the functions most important to you via one single Inspector section.

- To rename a Quick Control, double-click on the name in the slot to select it, enter a new name and press [Enter].
- To replace a parameter assignment with a different parameter, click on the corresponding Quick Control slot and double-click a different parameter.

Automatic Assignment of VST Instrument Parameters

When you create an instrument track or load a VST instrument via the **VST Instruments** window including creating an associated MIDI track, the main parameters of the instrument are automatically assigned to the slots on the **Quick Controls** tab in the Inspector.

NOTE

This only works if the VST instrument supports this feature.

If you have changed the parameter assignment or if you manually route a MIDI track to a VST instrument, you can retrieve the default assignments.

PROCEDURE

1. In the **Inspector** for your track, open the **Quick Controls** tab.
2. Click **Get Default QCs from Plug-in**.

Removing Parameter Assignments

- To remove a parameter from a slot, double-click the parameter name to select it and press the [Delete] or [Backspace] key. Confirm by pressing [Return].

  Alternatively, you can click in the corresponding slot and select **No parameter** from the pop-up menu.

- To remove the Quick Control assignments for all slots, click the **Remove All QC Assignments** button.

Showing Automated Quick Control Assignments

You can show all Quick Control assignments that have been automated for one track.

PROCEDURE

1. Click the track for which you want to show automated Quick Control assignments.
2. In the **Inspector** for your track, open the **Quick Controls** tab.
3. On the **Quick Controls** tab, click **Preset Management** .
4. Select **Show Automated QC Assignments**.

RESULT

The automation tracks of the automated Quick Control parameters open for the selected track.

NOTE

- If **Volume** is assigned as a Quick Control parameter, it is always shown as automated, independent of whether it is automated or not.
- You can also show automated Quick Control assignments via the **Track Quick Controls** rack in the **MixConsole**.

Saving/Loading Track Quick Control Assignments as Presets

You can save and load your own Quick Control assignments as presets for audio, instrument, MIDI, FX, and group tracks. You can also use the factory presets.

PROCEDURE

1. In the **Inspector** for your track, open the **Quick Controls** tab.

   For instrument tracks, the Track Quick Controls are automatically set to the 8 default VST Quick Controls of the loaded instrument by default.

   NOTE

   You can also make your own assignments and save them as presets and delete, rename, or reset the presets to the default assignments.

2. On the Quick Controls tab, click **Preset Management** .
   - To save a preset, click **Save Preset**.

     Enter a name in the **Type In Preset Name** dialog and click **OK**.
   - To load a preset, select one of the presets in the upper list of the menu.

     The Track Quick Control assignment changes and gives you access to the channel parameters.

RELATED LINKS

Manual Assignment via the Inspector Tab on page 712

Connecting Quick Controls with Remote Controllers

Quick Controls become powerful when used in combination with a remote controller.

PREREQUISITE

Your remote device is connected to Nuendo via MIDI.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Devices** list, select **Track Quick Controls** or **VST Quick Controls**.

   This opens the respective section on the right.
3. From the **MIDI Input** pop-up menu, select the MIDI port on your computer.

   If your remote controller has its own MIDI input and supports MIDI feedback, you can connect your computer to the device input. Select the corresponding MIDI port in the **MIDI Output** pop-up menu.

   Alternatively, you can select **All MIDI Inputs**.
4. Click **Apply**.
5. Activate **Learn**.
6. In the **Control Name** column, select **QuickControl 1**.

7. On your remote control device, move the control that you want to use for the first quick control.
8. Select the next slot in the **Control Name** column and repeat the previous steps.
9. Click **OK**.

NOTE

In addition to using the Learn function to set up the table in the **Quick Controls** section, you can modify the values manually. The available options are identical to the ones available for the Generic Remote device.

RESULT

The quick controls are now associated with control elements on your external remote controller. If you move a control element, the value of the parameter that is assigned to the corresponding Quick Control changes accordingly.

The remote controller setup for Quick Controls is saved globally, that is, it is independent of any projects. If you have various remote controllers, you can save and load several Quick Control setups using the **Export** and **Import** buttons.

RELATED LINKS

The Generic Remote device on page 722

Activating Pick-up Mode for Hardware Controls

Pick-up Mode allows you to change configured Quick Control parameters without accidentally modifying their previous values.

Often, the parameter settings of your Quick Controls are initially different from the settings of your hardware controls, for example, when the hardware controls control, different Quick Controls on different tracks. In this case, you will notice that moving a hardware control changes the previous value of a parameter in a way that it is initially set to the zero position, before it is changed. Thus, you always lose your previous setting of the parameter.

To avoid this, you can activate **Pick-up Mode**. This has the effect that when you move your hardware control, you can only change the parameter once the control reaches the parameter's previous value. The control "picks up" the parameter at the value to which it was last set.

NOTE

This only applies to hardware controllers whose controls use specific ranges.

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Devices** list, select **Track Quick Controls** or **VST Quick Controls**.

3. Activate **Pick-up Mode**.
4. Click **OK**.

Quick Controls and Automatable Parameters

You can use Quick Controls not only to access certain parameters of the current track, but also to control all automatable parameters. This makes it possible to use the **Quick Controls** tab of a dedicated track as a kind of “mini mixer”, controlling parameters on other tracks.

IMPORTANT

Use this function with caution, however, as you might accidentally modify parameters on other tracks.

PROCEDURE

1. Create a new, empty audio track and open its **Quick Controls** tab.

   This track has no events or parts.

2. Hold down the [Ctrl]/[Command] key and click on the slot for Quick Control 1.

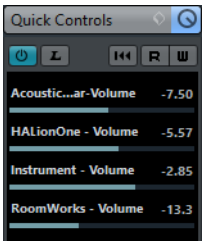
   The parameter selection context menu opens, but it lists not the parameters of the current track, but all automatable parameters.

3. Open the **VST Mixer** folder.

   The pop-up menu lists all channels available in the MixConsole of your current project.

4. Assign a parameter of one particular channel to Quick Control 1, and another parameter of another channel to Quick Control 2.

RESULT

The **Quick Controls** tab has become a secondary mixer, dedicated to quick-controlling parameters on other tracks.

IMPORTANT

Quick Controls that are assigned that way cannot work when saved as track presets.

Remote controlling Nuendo

It is possible to control Nuendo via MIDI.

A large number of MIDI control devices is supported. This chapter describes how to set up Nuendo for remote control. The supported devices are described in the separate PDF document “Remote Control Devices”.

There is also a Generic Remote Device option, allowing you to use any MIDI controller to remote control Nuendo.

RELATED LINKS

The Generic Remote device on page 722

Setting Up

Connecting the remote device

Connect the MIDI output on the remote unit to a MIDI input on your MIDI interface. Depending on the remote unit model, you may also need to connect a MIDI Out on the interface to a MIDI In on the remote unit (this is necessary if the remote unit features “feedback devices” such as indicators, motorized faders, etc.).

If you are recording MIDI tracks, you do not want any MIDI data from the remote unit to be accidentally recorded as well. To avoid this, you should make the following setting:

PROCEDURE

1. Open the Device Setup dialog from the Devices menu.
2. Select “MIDI Port Setup” in the list on the left.
3. Check the table on the right and locate the MIDI input to which you have connected the MIDI remote unit.
4. Deactivate the checkbox in the “In ‘All MIDI Inputs’” column for that input, so that the State column reads “Inactive”.
5. Click OK to close the Device Setup dialog.

RESULT

Now you have removed the remote unit input from the “All MIDI Inputs” group. This means that you can record MIDI tracks with the “All MIDI Inputs” port selected without risking to record the data from the remote unit at the same time.

Selecting a remote device

PROCEDURE

1. Open the Device Setup dialog from the Devices menu.
2. If you cannot find the remote device you are looking for, click on the plus sign in the top left corner and select the device from the pop-up menu.

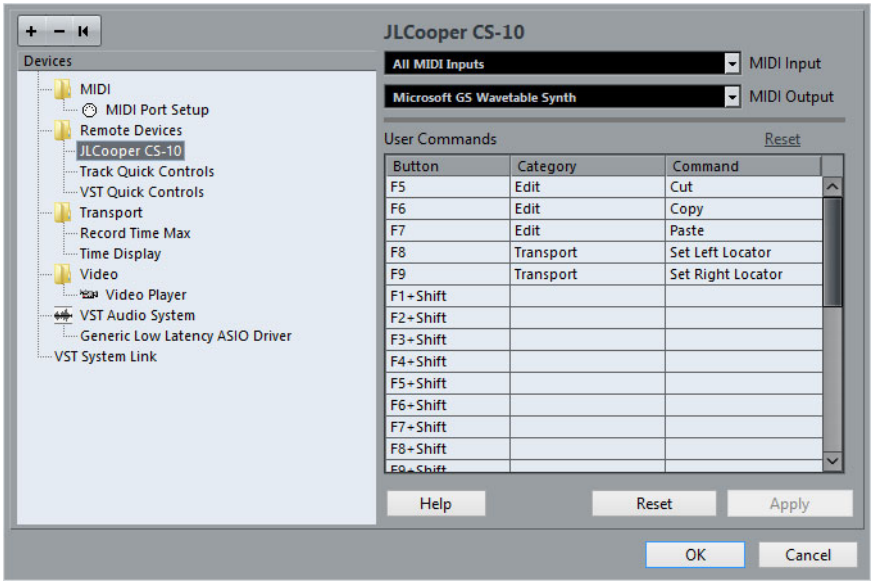
   The selected device is added to the Devices list.

   NOTE

   Note that it is possible to select more than one remote device of the same type. If you have more than one remote device of the same type, these will be numbered in the Devices list. For example, to be able to use a Mackie Control Extender, you must install a second Mackie control device.

3. Select your MIDI control device model from the Devices list.

   Depending on the selected device, either a list of programmable function commands or a blank panel is shown in the right half of the dialog window.



4. Select the correct MIDI input from the pop-up menu.

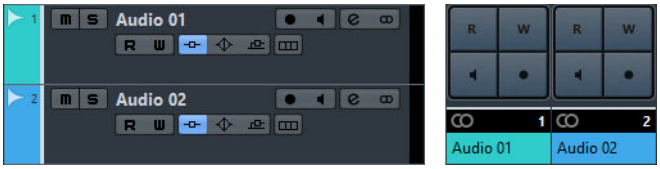
   If necessary, select the correct MIDI output from the pop-up menu.

5. Click OK to close the dialog.

RESULT

You can now use the MIDI control device to move faders and knobs, activate Mute and Solo, etc. The exact parameter configuration depends on which external MIDI control device you are using.

A white stripe in the Project window and in the MixConsole indicates which channels are currently linked to the remote control device.



IMPORTANT

Sometimes communication between Nuendo and a remote device is interrupted or the handshaking protocol fails to create a connection. To re-establish communication with any device in the Devices list, select it and click the Reset button in the lower part of the Device Setup dialog. The “Send Reset Message to all Devices” button at the top left of the dialog next to the “+” and “-” buttons will reset every device in the Devices list.

Operations

Global options for remote controllers

In the Device Setup dialog, on the page for your remote device, some (or all) of the following global functions may be available (depending on your remote device):

Bank pop-up menu

If your remote device contains several banks, you can select the bank you want to use.

The bank you select here is used by default when Nuendo is launched.

Smart Switch Delay

Some of the Nuendo functions (e.g. Solo and Mute) support the so called smart switch behavior: In addition to regular activation/deactivation of a function by clicking a button, you can also activate the function for as long as the button is pressed. Upon releasing the mouse button, the function is deactivated.

This pop-up menu allows you to specify how long a button must be pressed before it goes into smart switch mode. When “Off” is selected, the smart switch function is deactivated in Nuendo.

Enable Auto Select

If this option is activated, touching a fader on a touch-sensitive remote control device automatically selects the corresponding channel. On devices without touch-sensitive faders, the channel gets selected as soon as you move the fader.

Writing automation using remote controls

Automating the MixConsole in Touch mode using a remote control device is done in the same way as when you operate on-screen controls in Write mode. In order to replace existing automation data for a control in Touch mode, the computer needs to know how long the user actually “grabbed” or used the control. When doing this “on screen”, the program simply detects when the mouse button is pressed and released. When you are using an external remote control device without touch-sensitive controls, Nuendo cannot tell whether you “grab and hold” a fader or simply move it and release it.

Therefore, when you are using a device without touch-sensitive controls and want to replace existing automation data, pay attention to the following:

- If you activate Write mode and move a control on the remote control device, all data for the corresponding parameter is replaced from the position where you moved the control, up to the position where playback is stopped.

  In other words, as soon as you move a control in Write mode, it remains “active” until you stop playback.

- Make sure that you move only the controller you want to replace.

Assigning remote key commands

For some remote devices, you can assign any Nuendo function (to which a key command can be assigned) to generic buttons, wheels, or other controls.

PROCEDURE

1. Open the Device Setup dialog and select your remote device.

   On the right side of the window you will find a three column table. This is where you assign commands.

2. Use the Button column to locate a remote device control or button to which you wish to assign a Nuendo function.
3. Click in the Category column for the control and select one of the Nuendo function categories from the pop-up menu.
4. Click in the Command column and select the desired Nuendo function from the pop-up menu.

   The available items on the pop-up menu depend on the selected category.

5. Click “Apply” when you are done.

   Click “Reset” to revert to the default settings.

RESULT

The selected function is now assigned to the button or control on the remote device.

A note about remote controlling MIDI tracks

While most remote control devices will be able to control both MIDI and audio channels in Nuendo, the parameter setup may be different. For example, audio-specific controls (such as EQ) will be disregarded when controlling MIDI channels.

Accessing device panel parameters via remote control devices

Nuendo allows you to control external MIDI devices through user device panels.

When you have assigned project parameters to a device panel to be displayed in the MixConsole (i.e. when creating the panel, you must select the Channel Strip Size option in the Add Panel dialog), you can access these parameters through some of the remote control devices supported by Nuendo.

This feature is supported for the following devices:

- Steinberg Houston
- Mackie Control
- Mackie HUI
- Yamaha DM 2000
- CM Motormix
- SAC2K

These remote control devices provide an extra display page in the Inserts section for the selected channel.

This page is called User and is displayed as the 9th insert page for audio channels and as the 5th insert page for MIDI channels. It allows you to control the parameters assigned to your user device panel from your remote control device.

The Generic Remote device

If you have a generic MIDI controller, you can use this for remote control of Nuendo by setting up the Generic Remote device:

PROCEDURE

1. Open the Device Setup dialog on the Devices menu.

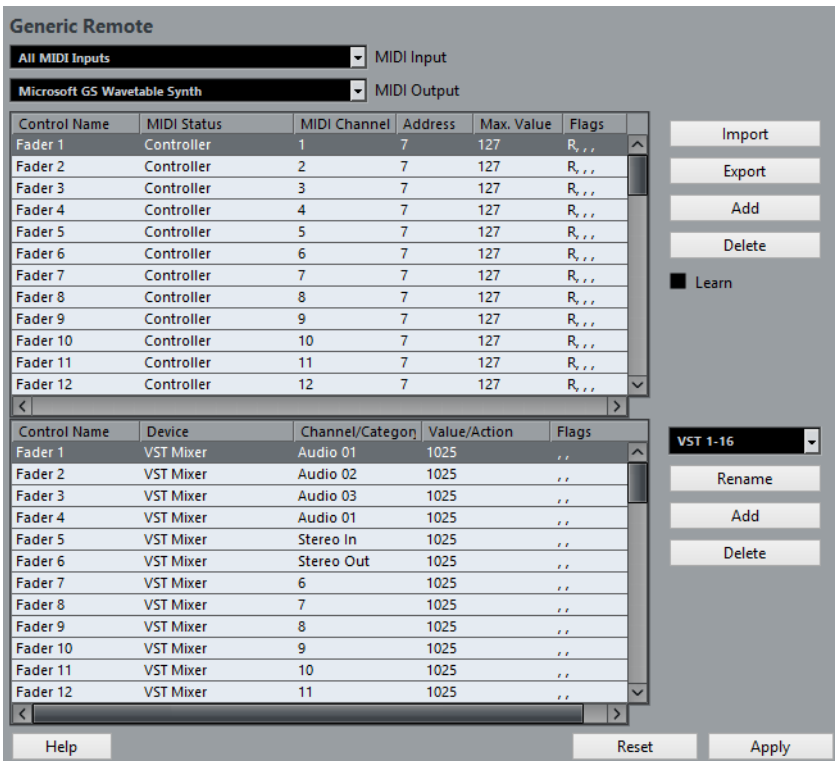
   If the Generic Remote device is not on the Devices list, you need to add it.

2. Click the “+” sign in the top left corner and select the “Generic Remote” device from the pop-up menu.

   When the Generic Remote device is added in the Device Setup dialog, you can open the corresponding window by selecting “Generic Remote” from the Devices menu.

3. Select the Generic Remote device in the Devices list to the left.

   The settings for the Generic Remote device are displayed, allowing you to specify which control on your device should control which parameter in Nuendo.



4. Use the MIDI Input and Output pop-up menus to select the MIDI port(s) to which your remote device is connected.

5. Use the pop-up menu to the right to select a bank.

   Banks are combinations of a certain number of channels, and are used because most MIDI devices can control only a limited number of channels at a time (often 8 or 16). For example, if your MIDI control device has 16 volume faders, and you are using 32 MixConsole channels in Nuendo, you would need two banks of 16 channels each. When the first bank is selected you can control channel 1 to 16; when the second Bank is selected you can control channel 17 to 32.

6. Set up the table at the top according to the controls on your MIDI control device.

   The columns have the following functionality:

Column	Description
Control Name	Double-clicking this field allows you to enter a descriptive name for the control (typically a name written on the console). This name is automatically reflected in the Control Name column in the lower table.

Column	Description
MIDI Status	Clicking in this column opens a pop-up menu, allowing you to specify the type of MIDI message sent by the control (e.g. Controller, Prog. Change Trigger). The NRPN and RPN controllers are part of the MIDI specification and present a way to extend the available control messages. The “Ctrl JLCooper” option is a special version of a Continuous Controller where the 3rd byte of a MIDI message is used as address instead of the 2nd byte (a method supported by various JL-Cooper remote devices). For a description of the Ctrl-Houston status value, see the Steinberg Houston hardware manual.
MIDI Channel	Clicking in this column opens a pop-up menu, allowing you to select the MIDI channel on which the controller is transmitted.
Address	The Continuous Controller number, the pitch of a note, or the address of a NRPN/RPN Continuous Controller.
Max. Value	The maximum value the control will transmit. This value is used by the program to “scale” the value range of the MIDI controller to the value range of the program parameter.
Flags	Clicking in this column opens a pop-up menu, allowing you to activate or deactivate three flags: ▪ Receive – activate this if the MIDI message should be processed on reception. ▪ Transmit – activate this if a MIDI message should be transmitted when the corresponding value in the program changes. ▪ Relative – activate this if the control is an “endless” rotary encoder, which reports the number of turns instead of an absolute value.

- If you find that the table at the top holds too many or too few controls, you can add or remove controls with the Add and Delete buttons to the right of the table.
- If you are uncertain of which MIDI message a certain controller sends, you can use the Learn function.

  Select the control in the upper table (by clicking in the Control Name column), move the corresponding control on your MIDI device and click the Learn button to the right of the table. The MIDI Status, MIDI Channel, and Address values are automatically set to those of the moved control.
- If you use the Learn function for a control that sends a Program Change value, the “Prog. Change Trigger” option is automatically selected on the “MIDI Status” pop-up menu. This allows you to use the different values of a Program Change parameter to control different parameters in Nuendo.

  If this does not give you the result you want, try using the “Prog. Change” value instead.

7. Use the table at the bottom to specify which Nuendo parameters you want to control.

   Each row in the table is associated to the controller in the corresponding row in the first table (as indicated by the Control Name column). The other columns have the following functionality:

Column	Description
Device	Clicking in this column opens a pop-up menu, used for determining which device in Nuendo is controlled. The special “Command” option allows you to perform certain command actions by remote control. One example of this is the selection of remote banks.
Channel/ Category	This is where you select the channel to be controlled or, if the “Command” Device option is selected, the Command category.
Value/ Action	Clicking in this column opens a pop-up menu, allowing you to select the parameter of the channel to be controlled (typically, if the “VST Mixer” Device option is selected, you can choose between volume, pan, send levels, EQ, etc.). If the “Command” Device option is selected, this is where you specify the “Action” of the category.
Flags	Clicking in this column opens a pop-up menu, allowing you to activate or deactivate three flags: ▪ Push Button – When activated, the parameter is only changed if the received MIDI message shows a value unequal to 0. ▪ Toggle – When activated, the parameter value is switched between minimum and maximum value each time a MIDI message is received. The combination of Push Button and Toggle is useful for remote controls which do not latch the state of a button. One example is controlling mute status with a device on which pressing the Mute button turns it on, and releasing the Mute button turns it off. If Push Button and Toggle are activated, the Mute status will change between on and off whenever the button is pressed on the console. ▪ Not Automated – When activated, the parameter will not be automated.

8. If necessary, make settings for another bank.

NOTE

Note that you only need to make settings in the bottom table for this bank. The table at the top is already set up according to the MIDI remote device.

If necessary, you can add banks by clicking the Add button below the Bank pop-up menu.

Clicking the Rename button allows you to assign a new name to the currently selected bank, and you can remove an unneeded bank by selecting it and clicking the Delete button.

9. When you are finished, close the Device Setup window.

Now, you can control the specified Nuendo parameters from the MIDI remote device. To select another bank, use the pop-up menu in the Generic Remote window (or use a control on the MIDI remote device, if you have assigned one for this).

Importing and exporting remote setups

The Export button in the top right corner of the Generic Remote Setup window allows you to export the current setup, including the Control configuration (the table at the top) and all banks. The setup is saved as a file (with the file extension ".xml"). Clicking the Import button allows you to import saved remote setup files.

NOTE

The last imported or exported remote setup will automatically be loaded when the program starts or the Generic Remote control is added in the Device Setup dialog.

Track Quick Controls

If you have an external remote control device, you can set it up to control up to eight parameters of each audio track, MIDI track or instrument track, using the Track Quick Controls feature in Nuendo.

RELATED LINKS

Connecting Quick Controls with Remote Controllers on page 697

The Remote Control Editor

Often, the automatic mapping of plug-in parameters to remote control devices appears rather random, and not very intuitive. The Remote Control Editor allows you to define your own mapping of VST plug-in parameters to the controls of the supported hardware controllers.

- To open the Remote Control Editor, right-click the plug-in panel of the plug-in that you want to remote-control and select "Remote Control Editor".

Layout Section

The main area of the editor is the Layout section. Layouts represent the hardware devices that are used to remote-control the plug-in parameters. Like these devices, a layout can have a number of pages. These pages contain a number of cells, which in turn contain controls. The available controls are a text label, a knob, and two switches.

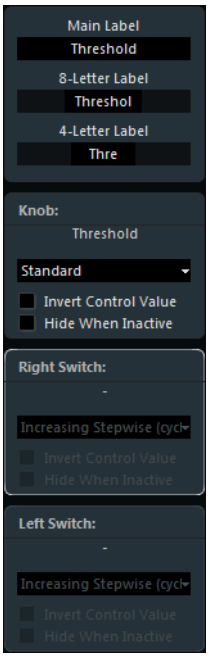
You can perform the following editing operations:

- Change the parameter assignments
- Change the name in the text label
- Set up the cells
- Arrange the order of cells and pages

When you open the editor for the first time, the Standard Layout is shown.

Inspector Section

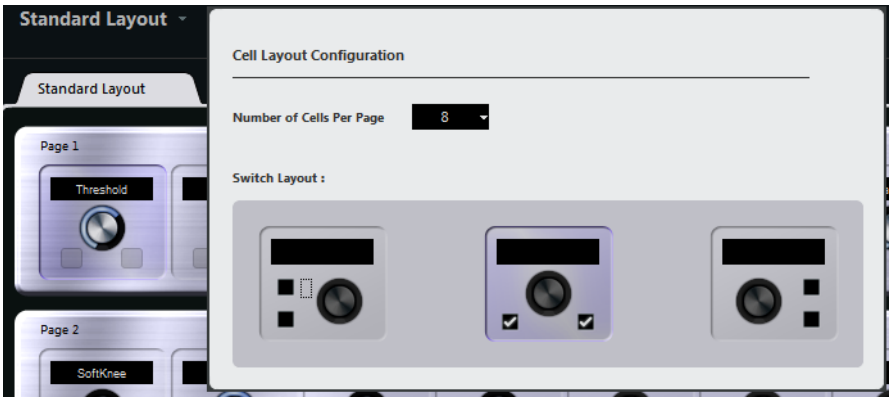
The Inspector contains the settings and the parameter assignment for the selected cell. The upper section contains settings for the text label. The lower section contains settings for the knob and the switches.



Status Bar

When you position the mouse pointer over an element in the editor window, the status bar shows information on what you can do with this element.

Setting up the Standard Layout



Click the “Set up Cell Layout” button to open the Cell Layout Configuration panel. Here, you can make the following settings:

- Use the pop-up menu to specify the number of cells per page.
- In the lower section, select the switch layout that you want to use for the pages.

  You can specify the number of switches for a cell by activating/deactivating them.

Defining the Controls

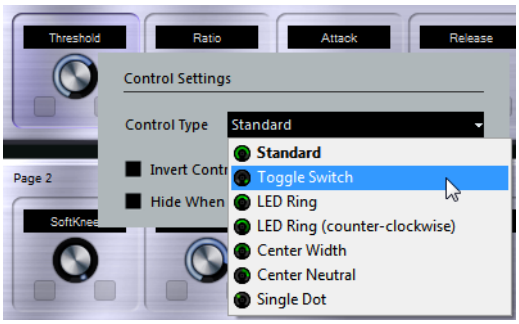
You can define the operation for a particular switch or knob. This includes changing the LED ring or changing its behaviour, from continuous value representation to on/off, for example.

Right-click the control and select a new control style in the settings window or select the control and select a style in the inspector.

NOTE

- To be able to make settings for a control, it has to be assigned to a function.
- Not all hardware devices support all control type settings.

Control Type Settings for Knobs



The following control types are available for knobs:

Standard

A standard knob with undefined LED style.

Toggle Switch

This is best used for parameters with two states, like On/Off buttons.

LED Ring

An LED ring is shown around the knob. The setting increases clockwise.

LED Ring (counter-clockwise)

An LED ring is shown around the knob. The setting increases counter-clockwise from right to left.

Center Width

The LED ring starts at the top center position and when the settings increase, an LED is shown growing in both directions.

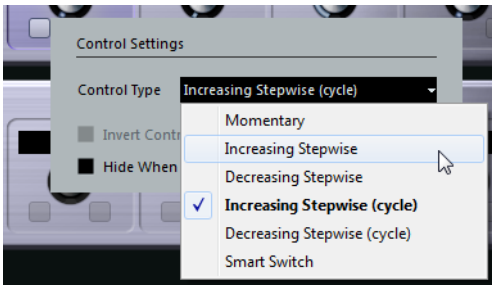
Center Neutral

The dial starts at the top center position and can be moved left or right, like a pan control, for example.

Single Dot

As “LED Ring”, but showing only a dot to indicate the current value.

Control Type Settings for Switches



The following options are available for switches:

Momentary

The assigned function is active for as long as you keep the switch pressed.

Increasing Stepwise

Pressing the switch steps through the available settings until the maximum is reached.

Decreasing Stepwise

Pressing the switch steps through the available settings in reverse order until the minimum is reached.

Increasing Stepwise (cycle)

Pressing the switch steps through the available settings, starting over with the minimum value when the maximum is reached.

Decreasing Stepwise (cycle)

Pressing the switch steps through the available settings in reverse order, starting over with the maximum value when the minimum is reached.

Smart Switch

This changes between two states every time you press the switch, like an On/Off button. Furthermore, if you keep the switch pressed, you enter Momentary mode, that is, the corresponding function stays active for as long as the button is pressed.

Invert Control Value

This inverts the control state/value.

Hide Control When Inactive

Hides plug-in parameters when they are inactive or disabled.

Assigning Parameters to Controls

PROCEDURE

1. Click the L button on the toolbar to activate Learn mode for the editor.

2. In the editor, select the control that you want to assign to a plug-in parameter.

   A colored frame around a control shows that this control has the Learn focus.

3. Click on a parameter on the plug-in panel.

   This assigns that parameter to the control.

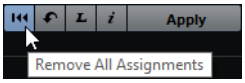
   You can also double-click on a control in the editor to open the list of available plug-in parameters, and click a parameter to assign it to the control.

4. Click on another control to set the Learn focus to that control and assign a parameter to it.

5. Press [Esc] to end Learn mode.

Removing the Parameter assignment

- To remove the parameter assignment for a cell, activate Learn mode, select the cell, and press [Delete] or [Backspace].
- To remove all assignments, click the “Remove All Assignments” button.



Assignment Status

You can show the current assignment of all cells in a layout by activating the “i” button in the top right corner of the editor. This is useful to get a quick overview of the parameters that are assigned to the available controls.

Editing the Layout

In the Layout section, you can perform a number of editing operations and arrange the pages to your liking.

Making Name Settings for the Cells

The top three text fields in the Inspector can be used to specify the names for a cell.

This is useful if you are working with hardware devices that have value fields that only display a limited number of characters, for example. The first text field shows the long name, as it is shown in the cell. In the second field, you can enter a name that can contain up to 8 characters, and up to 4 characters in the third.

Rearranging the order of a page or a cell

- To copy the settings of one cell to another, select a cell, press [Alt]/[Option] and drag it to another cell.
- To move a cell, drag it to an empty cell.
- To swap the contents of two cells, press [Ctrl]/[Command] and drag one cell to the other.

NOTE

Drag and drop also works between different pages.

Navigating

- You can use the cursor keys to navigate in all directions.
- When Learn mode is active, pressing [Shift] allows you to step between the controls within the cells.
- To step forwards or backwards through the different layouts, use [Tab] and [Shift]-[Tab].

Adding/Removing Pages

- To add a page to a layout, click the “+” button on the right of a page.
- To remove a page, click the corresponding “-” button.

NOTE

A layout always contains at least one page.

Adding/Removing a New Hardware Layout

- To add a hardware layout for a particular hardware type, click the “+” button to the right of the tabs.
- To remove a hardware layout, click the “x” icon of a tab.

Changing the Settings in a Layout

- To modify an existing layout, save the new settings by clicking the Apply button in the top right corner of the editor.

  If the hardware supports this function, the changes are immediately reflected on the hardware controllers.

Resetting the Layout and Copying Layout Settings between Pages

Click the arrow button in the top right corner of the editor to revert to the default settings for the current layout or to copy the settings of one layout page to another.

Deactivating joysticks

When you have a joystick connected to your system, but do not want to use it with Nuendo, you can deactivate it.

PROCEDURE

1. Open the Device Setup dialog from the Devices menu.
2. Select the device in the list to the left in the dialog.

   The corresponding settings are shown to the right.
3. You can now activate/deactivate the joystick by activating or deactivating the respective dialog option.

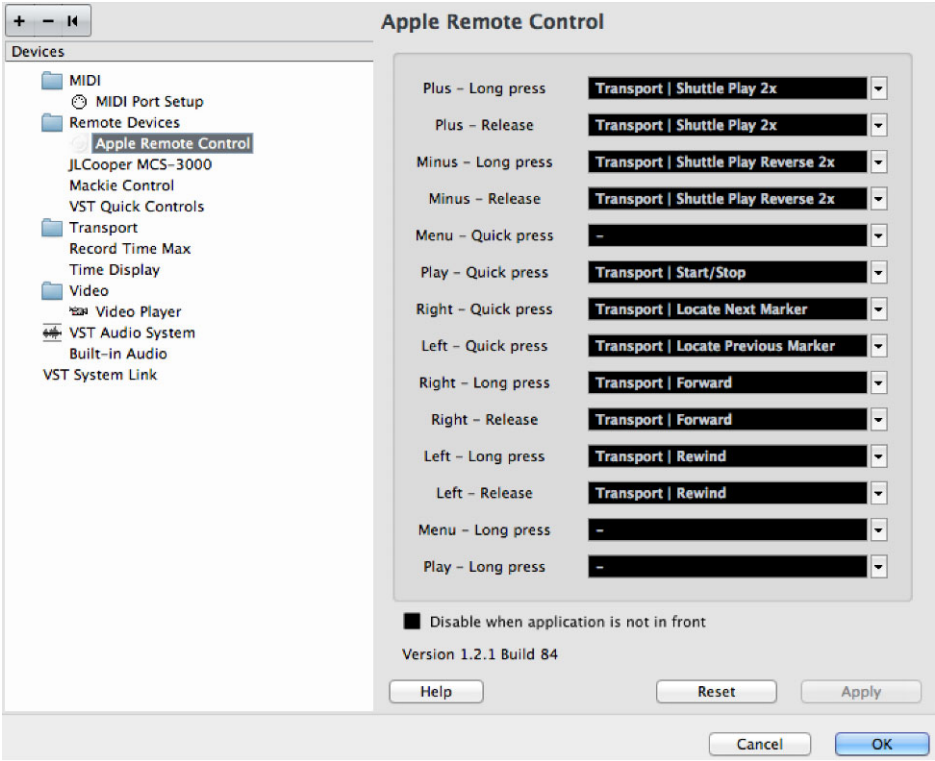
Apple Remote (Macintosh only)

Many Apple computers come with an Apple Remote Control, a small hand-held device akin to TV remote controls. It allows you to remotely control certain features in Nuendo.

PROCEDURE

1. Open the Device Setup dialog and select Apple Remote Control from the Add Device pop-up menu.
2. In the list on the right, the Apple Remote's buttons are listed. For each button you can open a pop-up menu from which you can select a Nuendo parameter.

   The parameter you select is assigned to the corresponding button on the Apple Remote.



   By default, the Apple Remote always controls the application that currently has the focus on your Macintosh computer (provided that this application supports the Apple Remote).

   NOTE

   When the "Disable when application is not in front" option is not selected, the Apple Remote will control Nuendo even if it does not have the focus.

MIDI realtime parameters and effects

For each MIDI track, you can set up a number of track parameters, or modifiers, and MIDI effects. These affect how the MIDI data is played back, “transforming” MIDI events in realtime before they are sent to the MIDI outputs.

On the following pages, the available parameters and effects are described. Keep in mind:

- The actual MIDI events will not be affected – the changes happen “on the fly”.
- Since the modifier settings do not change the actual MIDI data on the track, they will not be reflected in the MIDI editors. To convert the track settings into “real” MIDI events, use the Freeze MIDI Modifiers function or the Merge MIDI in Loop function.

RELATED LINKS

Making your settings permanent on page 765

The Inspector – general handling

The MIDI modifiers and effects are set up in the Inspector (although some settings are available in the MixConsole as well).

- To show the Inspector, click the “Set up Window Layout” button on the toolbar and activate the Inspector option.

  The Inspector is displayed to the left of the track list.

- For MIDI tracks, several sections are available in the Inspector. Which of these are displayed is determined in the setup context menu or the Setup dialog of the Inspector.

- You can fold or unfold the sections individually by clicking on the section name.

  Clicking the name for a hidden section brings it to view and hides the other sections. [Ctrl]/[Command]-clicking the tab allows you to hide or show a section without affecting other sections. [Alt]/[Option]-clicking a tab shows or hides all sections in the Inspector.

NOTE

Folding or hiding (via the Setup dialog) a section does not affect the functionality but merely hides the section from view. This means your settings will still be active even if you fold or hide the Inspector settings.

RELATED LINKS

Using the Setup options on page 1226

The Inspector sections

Basic track settings

The topmost Inspector section contains the basic track settings. These settings either affect the basic functionality for the track (mute, solo, enable record, etc.) or send out additional MIDI data to the connected devices (program change, volume, etc.). The section contains all settings that are available in the track list, with a few additional parameters:

Load/Save Track Preset button

Allows you to load or save a track preset.

Track name field

Click once to show/hide the topmost Inspector section. Double-click to rename the track.

Edit button

This opens the Channel Settings window for the track (a window showing a channel with volume fader and other controls, along with effect settings).

Mute/Solo buttons

Mutes or solos the MIDI track.

Read/Write buttons

Used for automating the track settings.

Open Device Panels button

If the MIDI track is routed to a device with a panel, clicking this button opens the respective panel. For more information, see the separate PDF document “MIDI Devices”.

Input transformer button

Opens the Input Transformer dialog, allowing you to transform incoming MIDI events in realtime.

Record enable button

Activate this to make the track ready for recording.

Monitor button

When this is activated (and the “MIDI Thru Active” option is activated in the Preferences dialog, MIDI page), incoming MIDI will be routed to the selected MIDI output.

Toggle Time Base button

Switches between musical (tempo related) and linear (time related) time base for the track.

Lock button

Activate this to disable all editing of all events on the track.

Show Lane button

Allows you to divide the tracks in lanes.

Volume

Use this to adjust the level for the track. Changing this setting will move the track’s fader in the MixConsole and vice versa.

MIDI Pan

Use this to adjust the panning of the track.

Delay

This adjusts the playback timing of the MIDI track. Positive values delay the playback while negative values cause the track to play earlier. The values are set in milliseconds.

In/Out/Chn pop-up menus

This is where you select MIDI input, MIDI output, and MIDI channel for the track.

Edit Instrument button

If the MIDI track is routed to a VST instrument, clicking this button opens the control panel for the VST instrument.

Bank and Program Selector pop-up menu

Allows you to select a sound, see below. (If no bank is available, only the Program selector is shown.)

Apply Track Preset button

Allows you to apply a track preset.

Map pop-up menu (NEK only)

Allows you to select a drum map for the track.

NOTE

- Note that the functionality of the Bank and Program selector settings (used for selecting sounds in the connected MIDI instrument) depends on the instrument to which the MIDI output is routed, and how you have set it up in the MIDI Device Manager. The MIDI Device Manager allows you to specify which MIDI instruments and other devices are connected to the various MIDI outputs, thus making it possible to select patches by name.
- Many of the basic track settings are duplicated in the MIDI Fader section of the Inspector.

RELATED LINKS

Track List on page 56
Using Channel Settings on page 409
Writing Automation Data on page 659
The Input Transformer on page 954
Defining the Track Time Base on page 156
Applying Track Presets on page 169
Working with Lanes on page 153
Setting Volume on page 381
MIDI Fader section on page 744
Using MIDI devices on page 751

Expression Map section (NEK only)

This section is used when working with the Expression Map features.

RELATED LINKS

Expression maps (NEK only) on page 854

Note Expression section (NEK only)

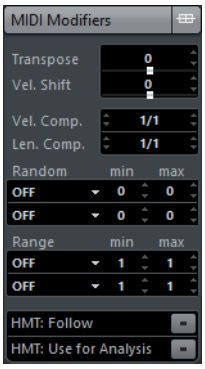
This section is used when working with the Note Expression features.

RELATED LINKS

Note Expression (NEK only) on page 868

MIDI Modifiers

The settings on this tab affect the MIDI events on the track in realtime during playback. They will also be in effect if you play “live” with the track selected and record enabled (provided that “MIDI Thru Active” is activated in the Preferences dialog, MIDI page). This makes it possible, for example, to transpose or adjust the velocity of your live playing.



NOTE

If you want to compare the result of your modifier settings with the “unprocessed” MIDI, you can use the Bypass button in the MIDI Modifiers section. When this is activated, the MIDI Modifiers settings will be temporarily disabled. A bypassed section is indicated by a yellow Bypass button.

Transpose

This allows you to transpose all notes on the track in semitones. The available range is -127 to +127 semitones, but remember that the total range of MIDI note numbers is 0 to 127. Furthermore, not all instruments can play back notes over the whole range. Therefore, extreme transpositions can give rather strange and unwanted results.

- You can also transpose individual MIDI parts using the Transpose field in the info line.
  The transposition in the info line (for the individual part) is added to the transpose value you have set up for the whole track in the Inspector.

NOTE

This setting is also affected by the global Transpose settings.

Velocity Shift

This setting lets you change the dynamics of all notes on the track. The value in this field is added to the velocity of each note message that is sent out (use negative values to lower the velocities). The range is -127 to +127 with 0 representing no change in velocity.

Note that the effect of changing the velocity depends on the sound and instrument.

NOTE

You can also adjust the velocity of events in individual MIDI parts using the Velocity field in the info line. The velocity shift in the info line (for the individual part) is added to the velocity shift you have set up for the whole track in the Inspector.

Velocity Compression

This function multiplies the velocity values with the factor you specify. This factor is set using a numerator (left value) and a denominator (right value), resulting in a fractional number (1/2, 3/4, 3/2 etc.). For example, if you set the factor to 3/4, the velocities will be three quarters of their original values. This will also affect the difference in velocity between the notes, thus compressing or expanding the velocity scale. Typically, you would combine this setting with the Velocity Shift parameter.

An example:

Let's say you have three notes with the velocity values 60, 90 and 120, and wish to "even out" the velocity differences somewhat. If you set the Velocity Compression value to 1/2, the notes will play back with the velocities 30, 45 and 60. By adding 60 in the Velocity Shift field, the notes will play back with the velocities 90, 105 and 120, meaning you have compressed the velocity range.

In a similar way, you can use Velocity Compression values greater than 1/1 together with negative values in the Velocity Shift field, to expand the velocity range.

IMPORTANT

Remember that the maximum velocity is always 127 no matter how much you try to expand.

Length Compression

This value adjusts the lengths of all notes on the track. As with Velocity Compression, the value is set with a numerator and denominator. For example, the value 2/1 means that all note lengths will be doubled, while 1/4 means all note lengths will be a quarter of the actual lengths.

Random

The Random settings let you introduce random variations to various properties of MIDI notes. Anything from very subtle variations to dramatic changes can be applied.

Range

The Range function lets you specify a note (pitch) or velocity range and either force all notes to fit within this range, or exclude all notes outside this range from playback. As with the Random function, there are two separate Range settings.

HMT: Follow (NEK only)

Activating this button for a track applies Hermode Tuning to the notes played on this track. Hermode Tuning retunes the notes you play and creates clear frequencies for every fifth and third interval, for example. Retuning only affects individual notes and maintains the pitch relationship between keys and notes. The retuning is a continuous process and takes the musical context into account.

When you apply Hermode Tuning to tracks that use VST 2 instruments, the played notes are retuned with every keystroke. Dynamic retuning while notes are playing is only possible with VST 3 instruments that support Micro Tuning and Note Expression. For VST instruments that support Note Expression, Hermode Tuning also works in MIDI Thru mode.

To activate Hermode tunig, activate the “HMT: Follow” button, and select one of the following tuning types in the “HMT Type” pop-up menu of the Project Setup dialog:

Mode	Description
None	No tuning is applied.
Reference (pure 3/5)	Tunes pure thirds and fifths.
Classic (pure 3/5 equalized)	Tunes pure thirds and fifths. In conflict situations, a slight equalization is applied. This tuning type is suitable for all kinds of music.
Pop Jazz (3/5/7)	Tunes pure thirds and fifths, and natural sevenths. This tuning type should not be applied to polyphonic music. Try this with pop or jazz.
Baroque (3/5 adaptive)	Tunes pure thirds and fifths. The degree of purity changes according to the sequence of harmonies. This tuning type is suitable for church organ and polyphonic music.

NOTE

It may take a moment until all notes are recalculated and you hear the results of the retuning. Notes that are produced by MIDI plug-ins are not taken into account.

HMT: Use for Analysis (NEK only)

If you activate this option, the notes played on the track are used to calculate retuning. Keep this activated when working with Hermode Tuning. On tracks with acoustic piano, we recommend to activate this option, and to deactivate “HMT: Follow”. This excludes the piano from being tuned which would sound unnatural.

RELATED LINKS

Transpose Functions on page 301

Editing Transpose and Velocity for MIDI Parts

When one or several MIDI parts are selected, the info line contains transpose and velocity fields.

- Adjusting the Transpose field transposes the selected parts in semitone steps.
- Adjusting the Velocity field shifts the velocity for the selected parts. The value that you specify is added to the velocities of the notes in the parts.

NOTE

This transposition does not change the actual notes in the part. It only affects the notes on playback. The transposition that you specify for a part on the info line is added to the transposition set for the whole track.

RELATED LINKS

Transpose Functions on page 301

Setting up random variations

There are two separate “random generators”, set up in the following way:

PROCEDURE

1. Open the Random pop-up menu and select which note property is randomized.

   The options are position, pitch, velocity and length.

   NOTE

   Keep in mind that depending on the content of the track, certain parameter changes might not be immediately noticeable or have any effect at all (as would be the case if applying random length to a percussion track playing “one-shot” samples for example). To best audition the random changes, choose a track with clearly defined rhythm and note content (as opposed to a string pad).

2. Set the desired range of random deviation by entering values in the two number fields.

   The two values govern the limits of the randomization, so that the values will vary between the left value and the right value (you cannot set the left value higher than the right value). The maximum random range for each property is listed in the table below:

Property	Range
Position	-500 to +500 ticks
Pitch	-120 to +120 semitones
Velocity	-120 to +120
Length	-500 to +500 ticks

NOTE

You can make independent settings for the two random generators.

To deactivate the Random function, open the Random pop-up menu(s) and select “OFF”.

Setting up ranges

PROCEDURE

1. Open the Range pop-up menu and select one of the following four modes:

Mode	Description
Vel. Limit	This function affects all velocity values outside the specified range. Velocity values below the Min setting (the lower limit of the range) are set to the Min value, and velocity values above the Max setting are set to the Max value. Notes with velocity values within the set range are not affected. Use this if you want to force all velocity values to fit within a certain range.
Vel. Filter	Velocity Filter works by excluding all notes with velocity values outside the specified range. Notes with velocity values below the Min setting or above the Max setting will not be played back. Use this to “isolate” notes with certain velocity values.
Note Limit	This function allows you to specify a pitch range, and forces all notes to fit within this range. Notes outside the specified range are transposed up or down in octave steps until they fit within the range.Note: If the range is too “narrow”, so that some notes cannot be fit within the range by octave-transposing, these notes will get a pitch in the middle of the range. For example, if you have a note with a pitch of F3, and the range is C4-E4, that note will be transposed to D4.
Note Filter	Note Filter works by excluding all notes with pitches outside the specified range. Notes lower than the Min setting or higher than the Max setting will not be played back. Use this to “isolate” notes with certain pitches.

2. Use the two fields to the right to set the minimum and maximum values.

   These values will be shown as numbers (0 to 127) for the velocity modes and as note numbers (C-2 to G8) for the pitch modes.

   NOTE

   Note that you can make independent settings for the two Range functions.

   To deactivate the Range function, open the Range pop-up menu(s) and select “OFF”.

MIDI Fader section

This contains a single channel, allowing you to set volume, pan, mute/solo and other parameters for the track, and a panel view of the active sends/inserts. This is a “mirror” of the track’s channel in the MixConsole.

Notepad section

This is a standard notepad, allowing you to enter notes and comments about the track. Each track has its own notepad in the Inspector.

Network section

This contains controls related to Nuendo’s Network functions.

RELATED LINKS

Networking on page 1036

VST Instrument section

If the MIDI track is routed to a VST instrument, a new section will appear at the bottom of the Inspector, labeled with the name of the VST instrument. Clicking this section shows a duplicate of the Inspector settings for the VST instrument channel. This makes it easy to adjust the channel settings for the VST instrument while you are editing the MIDI track.

- If multiple outputs for a VST instrument are activated, there is a setting called “Output” at the top of the VST Instrument section.

New sections will also be added in the following cases:

- When a MIDI track is routed to an external instrument or effect that has an associated MIDI Device. In this case, the new section will get the name of the device.
- When a MIDI track is routed to an effect plug-in that also receives audio data, i.e. that is used as an insert effect for an audio track (e.g. MIDI Gate), a section for this audio track appears in the MIDI track inspector.

- If a MIDI track is routed to a plug-in assigned to an FX channel track, an FX section is added to the Inspector.

NOTE

For an easy way to combine MIDI and VST instruments, check out instrument tracks.

RELATED LINKS

VST Instruments on page 690

Device Panel section

This allows you to display MIDI device panels, which are control panels for external hardware. This is described in the separate PDF document “MIDI Devices”.

Quick Controls section

This allows you to configure quick controls, e.g. to use remote devices.

RELATED LINKS

Track Quick Controls on page 709

MIDI effects

Nuendo comes with a number of MIDI effect plug-ins, capable of transforming the MIDI output from a track in various ways.

Just like the MIDI modifiers, MIDI effects are applied in realtime to the MIDI data played back from the track (or to MIDI you play live “thru” the track).

What are MIDI effects?

Although a MIDI effect can be similar to an audio effect, it is important to remember that you are not processing the sound resulting from MIDI playback, but the MIDI data (the “instructions” for how the music is played back).

A MIDI effect will change properties of the MIDI events (e.g. change the pitch of notes) and/or generate new MIDI events (for example, a MIDI delay may add new MIDI notes, “echoing” the original notes).

NOTE

The included MIDI effect plug-ins are described in the separate PDF document “Plug-in Reference”.

Insert and send effects

As with audio effects, there are two ways to route the MIDI events on a track to an effect:

NOTE

- If you add an insert effect, the MIDI events will be sent to the effect, which will process the data and pass it on to the track's MIDI output (or to another insert effect). In other words, the MIDI events will be routed "through" the insert effect.
- If you use a send effect, the MIDI events will be sent both to the track's MIDI output and to the effect. That is, you will get both the unprocessed MIDI events and the output of the MIDI effect. Note that the effect can send its processed MIDI data to any MIDI output – not necessarily to the one used by the track.

There are separate sections in the Inspector for MIDI inserts and MIDI sends.

MIDI Inserts section

This allows you to add up to four MIDI insert effects. The section contains the following items:

Preset Management button

Click this to open the Preset Management pop-up menu that allows you to save your settings as preset or to rename or remove the current preset.

Inserts State indicator and Bypass button

The symbol on the right of the title bar is blue when an insert effect is activated. You can click the symbol to bypass all insert effects for the track.

Effect selection pop-up menu (x 4)

Selecting an effect from this pop-up menu automatically activates it and brings up its control panel (which can be a separate window or a number of settings below the insert slot in the Inspector).To remove an insert effect completely, select "No Effect".

On button (x 4)

Allows you to turn the selected effect on or off.

Edit button (x4)

Click this to bring up the control panel for the selected effect. Depending on the effect, this may appear in a separate window or below the insert slot in the Inspector. Clicking the button again hides the control panel.

NOTE

Effects that display their controls in the Inspector can be opened in a separate control panel window by pressing [Alt]/[Option] and clicking the Edit button.

MIDI Sends section

This allows you to add up to four MIDI send effects. Unlike audio send effects, you can select and activate send effects individually for each track. The section contains the following items:

Sends State indicator and Bypass button

The symbol on the right of the title bar is blue when a send effect is activated. You can click the symbol to bypass all send effects for the track.

Effect selection pop-up menu (x 4)

Selecting an effect from this pop-up menu automatically activates it and brings up its control panel (which can be a separate window or a number of settings below the send slot in the Inspector).To remove a send effect completely, select “No Effect”.

On button (x 4)

Allows you to turn the selected effect on or off.

Pre/Post button (x4)

If this is activated, the MIDI signals will be sent to the send effects before the MIDI modifiers and insert effects.

Edit button (x4)

Click this to bring up the control panel for the selected effect. Depending on the effect, this may appear in a separate window or below the sends slot in the Inspector. Clicking the button again hides the control panel.

Output pop-up menu (x4)

This determines to which MIDI output the effect will send the processed MIDI events.

Channel setting (x4)

This determines on which MIDI channel the effect will send the processed MIDI events.

NOTE

Effects that display their controls in the Inspector can be opened in a separate control panel window by pressing [Alt]/[Option] and clicking the Edit button.

About presets

Several of the MIDI plug-ins come with a number of presets for instant use.

1) MIDI In and Out activity indicators
2) Save and Remove Preset buttons

- To load a preset, select it from the Presets pop-up menu of the plug-in.
- To save your current settings as a preset, click on the "+" button ("Save Preset") to the right of the Presets menu.

  You will be asked to specify a name for the preset. The saved preset will then be available for selection from the pop-up menu for all instances of that MIDI plug-in, in all projects.

- To remove a preset, select it and click on the "-" button ("Remove Preset").

At the left and right borders of the Presets pop-up menu you will also find MIDI In and Out activity indicators. Whenever the plug-in receives or transmits MIDI data, the left or the right indicator will light up, respectively.

Applying a MIDI insert effect – an example

Here is a step-by-step example of how to add a MIDI insert effect to a MIDI track:

PROCEDURE

1. Select the MIDI track and open the Inspector.
2. Open the MIDI Inserts tab in the Inspector.

   Alternatively you can use the MixConsole: activate the Channel Racks and select "Inserts".
3. Click in one of the insert slots to open the MIDI effect pop-up menu.
4. Select the desired MIDI effect from the pop-up menu.

   The effect is automatically activated (the power button for the insert slot lights up) and its control panel appears, either in a separate window or in the MIDI Inserts section below the slot (depending on the effect).

   Now all MIDI from the track will be routed through the effect.
5. Use the control panel to make settings for the effect.

   All included MIDI effects are described in the separate PDF document "Plug-in Reference".

   - You can bypass the insert effect by clicking its power button (above the insert slot).
   - To bypass all insert effects for the MIDI track, use the bypass button in the MIDI Inserts section in the Inspector, in the MixConsole toolbar or in the track list.
   - To remove an insert effect, click in its slot and select "No Effect".

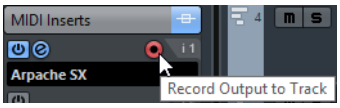
Recording a MIDI Insert Effect

You can record the output of a MIDI insert effect, that is, the events are created directly on a MIDI or instrument track.

PROCEDURE

1. Select **Project > Add Track > Instrument**.
2. In the **Add Instrument Track** dialog, select a VST instrument.
3. On the Instrument track, activate **Record Enable**.
4. In the Inspector, select **MIDI Inserts**.
5. Click the first insert effect slot and select a MIDI insert effect.

6. Activate the **Record Output to Track** button above the insert effect slot.



7. Activate **Record** and use your MIDI keyboard or the virtual keyboard to play some notes.

   The notes are modified by the MIDI insert effect and recorded directly on the track.

After Completing This Task

You can edit the recorded MIDI events, in the **Key Editor**, for example.

Using MIDI devices

The MIDI Device Manager allows you to specify and set up your MIDI devices, making global control and patch selection easy.

But the MIDI Device Manager also features powerful editing functions that can be used to create MIDI device panels. MIDI device panels are internal representations of external MIDI hardware, complete with graphics. The MIDI device panel editor provides all the tools you need to create device maps where every parameter of an external device (and even an internal device like a VST instrument) can be controlled and automated from inside Nuendo.

For additional information on how to create panels for VST instruments, see the separate PDF document “MIDI Devices”.

RELATED LINKS

About Device panels on page 759

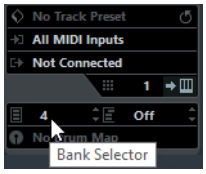
MIDI devices – general settings and patch handling

On the following pages, we will describe how to install and set up preset MIDI devices, and how to select patches by name from within Nuendo. For a description on how to create a MIDI device from scratch, please refer to the separate PDF document “MIDI Devices”.

About Program Change and Bank Select

To instruct a MIDI instrument to select a certain patch (sound), you send a MIDI Program Change message to the instrument. Program Change messages can be recorded or entered in a MIDI part like other events, but you can also enter a value in the Program Selector field in the Inspector for a MIDI track. This way, you can quickly set each MIDI track to play a different sound.

With Program Change messages, you are able to select between 128 different patches in your MIDI device. However, many MIDI instruments contain a larger number of patch locations. To make these available from within Nuendo, you need to use Bank Select messages, a system in which the programs in a MIDI instrument are divided into banks, each bank containing 128 programs. If your instruments support MIDI Bank Select, you can use the Bank Selector field in the Inspector to select a bank, and then the Program Selector field to select a program in this bank.

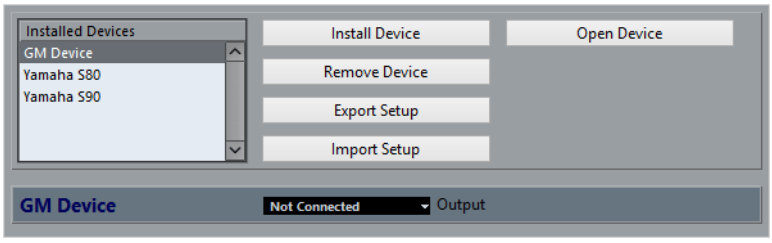


Unfortunately, different instrument manufacturers use different schemes for how Bank Select messages are constructed, which can lead to some confusion and make it hard to select the correct sound. Also, selecting patches by numbers this way seems unnecessarily cumbersome, when most instruments use names for their patches nowadays.

To help with this, you can use the MIDI Device Manager to specify which MIDI instruments you have connected by selecting from a vast list of existing devices or by specifying the details yourself. Once you have specified which MIDI devices you are using, you can select to which particular device each MIDI track is routed. It is then possible to select patches by name in the track list or Inspector.

Opening the MIDI Device Manager

Select MIDI Device Manager from the Devices menu to bring up the following window:



Installed Devices

List of connected MIDI devices. The first time you open the MIDI Device Manager, this list will be empty.

Install Device/Remove Device

Use these buttons to install/remove devices.

Export Setup/Import Setup

Use these buttons to import/export XML Device setups.

Open Device

This button opens the selected device.

Output

Here you specify to which MIDI output the selected device is connected.

When you open the MIDI Device Manager for the first time, it will be empty (because you have not installed any devices yet). On the following pages we describe how to add a pre-configured MIDI device to the list, how to edit the settings and how to define a device from scratch.

Note that there is an important difference between installing a preset MIDI device ("Install Device") and importing a MIDI device setup ("Import Setup"):

- The presets do not include any device mapping of parameters and controls and no graphic panels.

  They are simply patch name scripts. When you install a preset MIDI device, it is added to the Installed Devices list. For more information about patch name scripts, see the separate PDF document "MIDI Devices".

- A device setup can include device mapping, panels and/or patch information.

  Device setups are also added to the list of installed devices when imported.

RELATED LINKS

About Device panels on page 759

Defining a new MIDI device

If your MIDI device is not included in the list of pre-configured devices (and is not a "plain" GM or XG device), you need to define it manually to make it possible to select patches by name.

PROCEDURE

1. In the MIDI Device Manager, click the Install Device button.

   The Add MIDI Device dialog opens.

2. Select "Define New…" and click OK.

   The "Create New MIDI Device" dialog opens. For a description of the options in this dialog, see the separate PDF document "MIDI Devices".

3. In the Identical Channels list, activate the MIDI channels you would like the device to use.

   This means that the device will receive Program Change over any MIDI channel. For a description of Identical and Individual Channels, see the separate PDF document "MIDI Devices".

4. Enter a name for the device at the top of the dialog, and click OK.

   The device appears in the Installed Devices list, and the device node structure for the device is automatically shown in a new window.

5. Select Patch Banks from the pop-up menu at the top of the window.

   As you can see, the list is currently empty.

6. Make sure that the Enable Edit checkbox is activated.

   Now you can use the functions on the Commands pop-up menu on the left to organize the patch structure of the new device.

Installing a preset MIDI device

PROCEDURE

1. Click the Install Device button.

   A dialog opens listing all pre-configured MIDI devices. For now we assume that your MIDI device is included in this list.

2. Locate and select the device in the list and click OK.

   If your MIDI device is not included in the list but is compatible with the GM (General MIDI) or XG standards, you can select the generic GM or XG Device options at the top of the list.

   When you select one of these options, a name dialog will appear. Enter a name for the instrument and click OK.

   The device now appears in the Installed Devices list to the left.

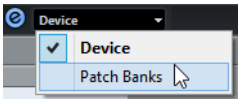
3. Make sure that the new device is selected in the list and open the Output pop-up menu.

4. Select the MIDI output that the device is connected to.

5. Click the Open Device button.

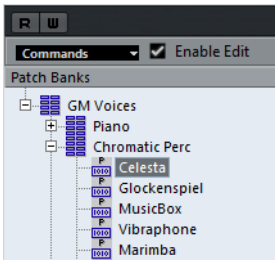
   A separate window opens for the selected device, showing a node structure in the left half of the window. At the top of this structure is the device itself, and below it the MIDI channels used by the device. For more information about the Device window, see the separate PDF document “MIDI Devices”.

6. Select Patch Banks from the pop-up menu at the top of the window.



RESULT

The Patch Banks list in the left half of the window shows the patch structure of the device. This could simply be a list of patches, but it is usually one or several layers of banks or groups containing the patches (much like a folder structure on a hard disk for example).



- You can rename a device in the Installed Devices list by double-clicking and typing – this is useful if you have several devices of the same model, and want to separate them by name instead of by number.

- To remove a device from the Installed Devices list, select it and click Remove Device.

NOTE

Note that if there already exists a panel for the device, opening the device might open this panel first. In this case, click on the Edit (“e”) button to open the Device window.

About Patch Banks

Depending on the selected device, you may find that the Patch Banks list is divided in two or more main banks. Typically, these are called Patches, Performances, Drums, etc. The reason for having several patch banks is that different “types” of patches are handled differently in the instruments. For example, while “patches” typically are “regular” programs that you play one at the time, “performances” may be combinations of programs, which could be split across the keyboard, layered, or used for multi-timbral playback, and so on.

For devices with several banks, you will find an additional item labeled “Bank Assignment” in the pop-up menu at the top of the window. Selecting this opens a window in which you can specify for each MIDI channel which bank it should use.

The selection here will affect which bank is displayed when you select programs by name for the device in the track list or Inspector. For example, many instruments use MIDI channel 10 as an exclusive drum channel, in which case you would want to select the “Drums” (or “Rhythm Set”, “Percussion”, etc.) bank for channel 10 in this list. This would then let you choose between different drum kits in the track list or Inspector.

Limitations

There is no easy way to import a patch name script into an existing MIDI device. For a complex workaround based on XML editing, see the separate PDF document “MIDI Devices”.

Selecting a patch for an installed device

If you return to the Project window at this point, you will find that the installed device has been added to the MIDI Output menus (in the track list and the Inspector). Now you can select patches by name, in the following way:

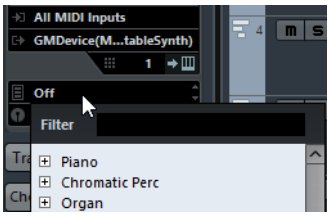
PROCEDURE

1. Open the Output menu (in the track list or Inspector) for the track you want to associate the installed device with, and select the device.

   This directs the track to the MIDI output specified for the device in the MIDI Device Manager. The Bank and Program Selector fields in the track list and Inspector are replaced by a single Program Selector field that currently reads “Off”.

2. Click the Program Selector field to display a pop-up menu, hierarchically listing all the patches in the device.

   The list is similar to the one displayed in the MIDI Device Manager. You can scroll the list up and down (if required), click the plus/minus signs to show or hide subgroups, etc.

   You can also use a filter function here. For this, enter the search term in the Filter field, e.g. “drum”, and press [Return] to display all sounds with “drum” in the name.

3. Click a patch in the list to select it.

   This sends the appropriate MIDI message to the device. You can also scroll the program selection up or down, as with any value.

Renaming patches in a device

The pre-configured devices list is based on the factory-preset patches, i.e. the patches included in the device when you first bought it. If you have replaced some of the factory presets with your own patches, you need to modify the device so that the patch name list matches the actual device:

PROCEDURE

1. In the MIDI Device Manager, select the device in the Installed Devices list.
2. Click Open Device.

   Make sure that Patch Banks is selected on the pop-up menu at the top of the window.
3. Activate the Enable Edit checkbox.

   When this is turned off (default), you cannot edit the pre-configured devices.
4. In the Patch Banks list, locate and select the patch you want to rename.

   In many instruments, the user-editable patches are located in a separate group or bank.
5. Click on the selected patch in the Patch Banks list to edit its name.
6. Type in the new name and press [Return].
7. Rename the desired patches in this way, and finish by deactivating Enable Edit again (to avoid modifying the device by accident).

   NOTE

   You can also make more radical changes to the patch structure in a device (adding or deleting patches, groups or banks), see below. For example, this is useful if you expand your MIDI device by adding extra storage media such as RAM cards.

Patch Structure

Patches are structured as follows:

- Banks are the main categories of sounds – typically patches, performances and drums, as described above.
- Each bank can contain any number of groups, represented by folders in the list.
- The individual patches, performances or drum kits are represented by presets in the list.

The Commands pop-up menu contains the following items:

Create Bank

Creates a new bank at the highest hierarchical level of the Patch Banks list. You can rename this by clicking on it and typing a new name.

New Folder

Creates a new subfolder in the selected bank or folder. This could correspond to a group of patches in the MIDI device, or just be a way for you to categorize sounds, etc. When you select this item, a name dialog opens, allowing you to name the folder. You can also rename the folder afterwards by clicking it and typing in the list.

New Preset

This adds a new preset in the selected bank or folder.

You can rename the preset by clicking it and typing a new name.

When the preset is selected, the corresponding MIDI events (Program Change, Bank Select, etc.) are shown in the event display to the right. The default setting for a new preset is Program Change 0 – to change this, proceed as follows:

IMPORTANT

For details on which MIDI events are used for selecting patches in the MIDI device, consult its documentation.

- To change which Program Change value is sent out to select the patch, adjust the number in the Value column for the Program Change event.
- To add another MIDI event (e.g. Bank Select) click directly below the last event in the list and select a new event from the pop-up menu.
  After adding a new event, you need to set its value in the Value column, as with Program Change.
- To replace an event, click on it and select another event from the pop-up menu.
  For example, a MIDI device may require that a Bank Select message is sent first, followed by a Program Change message, in which case you would need to replace the default Program Change message with a Bank Select message and add a new Program Change after that.

- To remove an event, select it and press [Delete] or [Backspace].

IMPORTANT

Different devices use different schemes for Bank Select. When you insert a Bank Select event, you should check the device's documentation to find out whether to choose "CC: BankSelect MSB", "Bank Select 14 Bit", "Bank Select 14 Bit MSB-LSB Swapped" or some other option.

Add Multiple Presets

This opens a dialog, allowing you to set up a range of presets to be added to the selected bank or folder.

Adding Multiple Presets

PROCEDURE

1. Add the event types required for selecting a patch in the MIDI device.

   This is done just as when editing the settings for a single event: clicking in the event display brings up a pop-up menu from which you can select an event type.

2. Use the Range column to set up either a fixed value or a range of values for each event type in the list.

   This requires some explanation:

   If you specify a single value in the Range column (e.g. 3, 15 or 127), all added presets will have an event of this type set to the same value.

   If you instead specify a value range (a start value and an end value, separated by a dash, e.g. 0–63), the first added preset will have an event set to the start value, the next value will be incrementally raised by one and so on, up to and including the end value.

MIDI Message Name	MIDI Message Bytes	Valid Range	Range
CC: Gen Purp 4	B0 13 0	0 - 127	0-127
Program Change	C0 0	0 - 127	7

   NOTE

   The number of added presets depends on the Range setting.

3. Specify a Default Name below the event display.

   The added events will get this name, followed by a number. You can rename presets manually in the Patch Banks list later.

4. Click OK.

   A number of new presets have now been added to the selected bank or folder, according to your settings.

Other editing functions

- You can move presets between banks and folders by dragging them to the Patch Banks list.
- You can remove a bank, folder or preset by selecting it in the Patch Banks list and pressing [Backspace].
- If you specify more than one bank, a Bank Assignment item is added to the pop-up menu at the top of the window. Use this to assign banks to the different MIDI channels.

RELATED LINKS

About Patch Banks on page 755

About Device panels

On the following pages we will describe how to use MIDI Device panels and the powerful MIDI device panel editing features of the MIDI Device Manager.

NOTE

We recommend that you first configure the patch banks, then export the device setup before editing the panels. This way, most of your settings will be saved in case of panel configuration problems.

The panels are saved in XML format. For more information, see the separate PDF document “MIDI Devices”.

Basic concept

The panel editing features in the MIDI Device Manager can be seen as a separate application or entity within Nuendo. It allows you to build device maps complete with control panels, including all parameters controllable from within Nuendo. Building more complex device maps requires that you are familiar with SysEx programming (see the separate PDF document “MIDI Devices”). But you can also create simpler panels by assigning MIDI Control Change messages to control objects, which does not require any programming skills.

Although these powerful editing features are there if you need them, you do not have to use them to use MIDI devices.

Device panels in the program

In this section we will take a look at a pre-configured MIDI device panel to illustrate how it can be used in Nuendo. Several device maps can be found in the Knowledge Base on the Steinberg web site.

Opening a device setup

PROCEDURE

1. Open the MIDI Device Manager from the Devices menu.
2. Click the “Import Setup” button.

   A file dialog opens.
3. Select a device setup file.

   The Device setup files are saved in XML format, for more information see the separate PDF document “MIDI Devices”.
4. Click Open. The Import MIDI Devices dialog opens where you can select one or several devices for import.

   A device setup file can contain one or several MIDI devices.
5. Select a device and click OK.

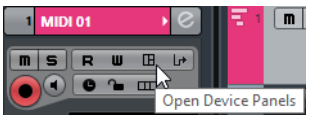
   The device is added to the list of installed devices in the MIDI Device Manager.
6. Select the correct MIDI output from the Output pop-up menu, select the device in the list and click the Open Device button.

   The device panel opens in a separate window. The Edit (“e”) button at the top opens the Edit Panel window, see the separate PDF document “MIDI Devices”.
7. Close the Device panel and return to the Project window.
8. Select the device from the “Output Routing” pop-up menu for a MIDI track.

   Note that for some devices, you may have to set the MIDI channel to “Any”.

RESULT

Now the Device panel can be opened by clicking the Open Device Panels button in the Inspector or in the channel for the corresponding track in the MixConsole.



NOTE

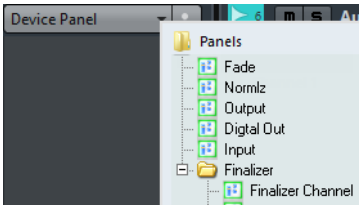
Note that [Ctrl]/[Command]-clicking the Open Device Panels button allows you to open a subpanel via the panel browser pop-up menu.

Showing panels in the Inspector

PROCEDURE

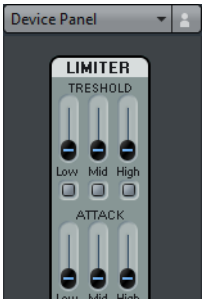
1. In the Inspector, open the Device Panel section and click on the arrow on the right.

   A “Panels” folder is shown with the selected device in a node structure below it. If you open all the folders, you can select any individual panel from the device that “fits” into the Device Panel space.



2. Select a panel from the list.

   The panel opens in the Inspector.



NOTE

If you cannot see any panels in the “Panels” folder, although you have successfully set up a MIDI device with several panels, make sure that you selected the correct channel from the Channel pop-up menu, preferably “Any” to see all device panels. Also make sure that the panels fit into the space, otherwise they will not be available in the “Panels” folder.

Showing panels in the MixConsole

PROCEDURE

1. Open the MixConsole and activate the “Show Channel Racks” button.
2. Click Racks to open the rack selector and activate the Device Panels rack.
3. Click the Panel header to expand the Device Panels rack.
4. Click the button at the right of the header.

   The Panels folder is displayed like in the Inspector, but with different available panels. Just like in the Inspector, the panel has to “fit” into the available space to be selectable.

5. Select a panel.

   The panel is shown in the Channel Racks section of the MixConsole.

Automating device parameters

Automation works just like for normal audio and MIDI tracks:

PROCEDURE

1. Open the device panel by clicking the Open Device Panels button in the Inspector.
2. Activate Write automation on the device panel.

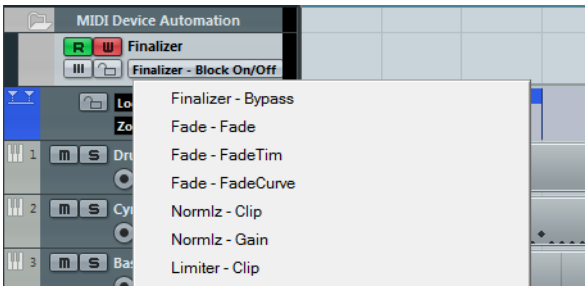
   You can automate the device by either moving knobs and sliders on the device panel or by drawing curves on the automation track for a selected parameter.

3. If you now go back to the Project window, there will be a MIDI Device Automation track in the track list.

   If the track is hidden, select “Show All Used Automation” on the Track Folding submenu of the Project menu.

   If you click in the name field, all parameters in the device are shown and can be selected for automation.

   - To open another automation track for the next parameter on the pop-up menu, click the + button (“Append automation track”) at the bottom left of the automation track.

NOTE

If you wrote automation but your MIDI device is not yet connected, the panel will not display any parameter changes when playing back the track with the Read button activated.

MIDI Processing

This chapter describes the various MIDI processing functions available on the MIDI menu. They offer various ways to edit MIDI notes and other events, either in the Project window or from within a MIDI editor.

MIDI functions vs. MIDI modifiers

In some cases, the result of a MIDI function can also be obtained by using MIDI modifiers and effects. For example, the operations “Transpose” and “Quantize” are available both as MIDI modifiers and as MIDI functions.

The main difference is that MIDI modifiers and effects do not affect the actual MIDI events on the track in any way, while MIDI functions change the events “permanently” (although recent changes can be undone).

Use the following guidelines to decide which path to choose for operations that are available both as modifiers or effects and as functions:

- If you want to adjust a few parts or events only, use MIDI functions. The MIDI modifiers and effects affect the output of the whole track (although they can be made permanent in a specific area with the Merge MIDI in Loop function).
- If you want to experiment with different settings, use MIDI modifiers and effects.
- MIDI modifiers and effects settings are not reflected in the MIDI editors, since the actual MIDI events are not affected.

  This can be potentially confusing; if you have transposed notes using modifiers for example, the MIDI editors will still show the notes with their original pitch (but they will play back at their transposed pitch). Therefore, MIDI functions are a better solution if you want to see the effects of your editing in the MIDI editors.

RELATED LINKS

MIDI realtime parameters and effects on page 735

What is affected by the MIDI functions?

Which events are affected when you use a MIDI function depends on the function, the active window and the current selection:

- Some MIDI functions only apply to MIDI events of a certain type.

  For example, quantization only affects notes, while the Delete Controllers function only applies to MIDI controller events.

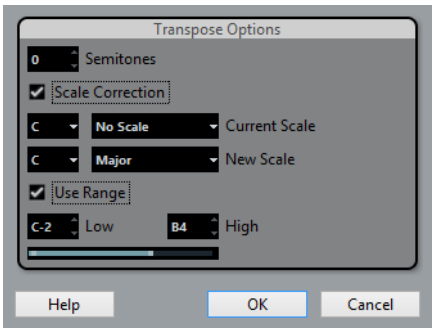
- In the Project window, the MIDI functions apply to all selected parts, affecting all events (of the relevant types) in them.
- In the MIDI editors, the MIDI functions apply to all selected events. If no events are selected, all events in the edited part(s) will be affected.

Transpose

The “Transpose Setup…” option on the MIDI menu opens a dialog with settings for transposing the selected notes.

NOTE

You can also use the transpose track for transposing.



Semitones

This is where you set the amount of transposition.

Scale Correction

Scale Correction transposes the selected notes by forcing them to the closest note of the selected scale type. This can be used for creating interesting key and tonal changes, either by itself or in conjunction with the other settings in the Transpose Setup dialog.

- To activate Scale Correction, click the checkbox.
- Select a root note and scale type for the current scale from the upper pop-up menus.

- Select a root note and scale type for the new scale from the lower pop-up menus.
  Make sure to select the correct root note if you want to keep the result in the same key as the original notes, or select an entirely different key if you want to experiment.

Use Range

When this is activated, transposed notes will remain within the limit that you specify with the Low and High values.

If a note would end up outside this limit after transposition, it is shifted to another octave, keeping the correct transposed pitch if possible. If the range between the upper and lower limit is very narrow, the note will be transposed "as far as possible", i.e. to notes specified with the Low and High values. If you set Low and High to the same value, all notes will be transposed to this pitch!

OK and Cancel

Clicking OK performs the transposition. Clicking Cancel closes the dialog without transposing.

RELATED LINKS

Transpose Functions on page 301

Making your settings permanent

The settings described in the chapter "MIDI realtime parameters" do not change the MIDI events themselves, but work like a "filter", affecting the music on playback. Therefore, you may want to make them permanent, i.e. convert them to "real" MIDI events, for example to transpose a track and then edit the transposed notes in a MIDI editor. For this, you can use two commands from the MIDI menu: "Freeze MIDI Modifiers" and "Merge MIDI in Loop".

RELATED LINKS

MIDI realtime parameters and effects on page 735

Freeze MIDI Modifiers

"Freeze MIDI Modifiers" applies all filter settings permanently to the selected track. The settings are "added" to the events on the track, and all modifiers are set to zero. The "Freeze MIDI Modifiers" function affects the following settings for MIDI tracks:

- Several settings on the main tab of the Inspector (program and bank selection and the Delay parameter).
- The settings on the MIDI Modifiers tab (i.e. Transpose, Velocity Shift, Velocity Compression, and Length Compression).
- The settings on the MIDI Inserts tab (for example, if you are using an arpeggiator and want to convert the added notes to real events).

The following settings for MIDI parts are taken into account as well:

- The Transpose and Velocity settings for parts displayed on the info line – the Volume setting is not taken into account.

Merge MIDI in Loop

The “Merge MIDI in Loop” function combines all unmuted MIDI events on all unmuted tracks, applies MIDI modifiers and effects, and generates a new MIDI part, containing all the events as you would hear them during playback.

PROCEDURE

1. Mute all the tracks that you do not want to include in the merge.

   Instead of muting whole tracks, you can also mute individual parts.

2. Set up the left and right locators to encompass the area that you want to merge.

   Only events starting within this area will be included.

3. Select the track on which you want the new part to be created.

   If you do not select a track, a new MIDI track is created. If several MIDI tracks are selected, the new part is inserted on the first selected track. Existing data on the selected track can be kept or overwritten (see below).

4. On the MIDI menu, select “Merge MIDI in Loop…”.

   The MIDI Merge Options dialog opens.

5. Activate the desired options and click OK.

   A new part is created between the locators on the destination track, containing the processed MIDI events.

   NOTE

   If you only want to include events from a single track in the merge operation, you may want to solo the track.

RELATED LINKS

MIDI Merge Options Dialog on page 766

MIDI Merge Options Dialog

The following options are available:

Include Inserts

If this is activated, any MIDI insert effects and MIDI modifiers currently activated for the tracks will be applied.

Include Sends

If this is activated, any MIDI send effects currently activated for the track(s) will be applied.

Erase Destination

If this is activated, any existing MIDI data between the left and right locators on the destination track will be deleted.

Include Chase

If this is activated, events placed outside the selected part but relating to it will be included in the processing, e.g. a Program Change right before the left locator.

Convert VST3 (NEK only)

If this is activated, all VST 3 data within the selected area is converted to MIDI data.

RELATED LINKS

Chase on page 235

Applying effects to a single part

Normally, the MIDI modifiers and effects affect a whole MIDI track. This may not always be what you want. For example, you may want to apply some MIDI effects to a single part (without having to create a separate track for that part only). The "Merge MIDI in Loop" function can help:

PROCEDURE

1. Set up your MIDI modifiers and MIDI effects the way you want them for the part.

   This will of course affect the whole track, but focus on the part for now.

2. Set the locators to encompass the part.

   An easy way to do this is to select the part and choose Locators to Selection from the Transport menu (or use the corresponding key command, by default [P]).

3. Make sure that the track holding the part is selected in the track list.

4. On the MIDI menu, select "Merge MIDI in Loop…".

   The MIDI Merge Options dialog opens.

5. Activate the desired options, making sure that "Erase Destination" is activated, and click OK.

   A new part is created on the same track, containing the processed events. The original part is deleted.

6. Turn off or reset all MIDI modifiers and effects, so that the track plays back as before.

Dissolve Part

The Dissolve Part function on the MIDI menu allows you to separate MIDI events according to channels or pitches:

- When you work with MIDI parts (on MIDI channel “Any”) containing events on different MIDI channels, activate the “Separate Channels” option.
- To separate MIDI events according to pitch, activate the “Separate Pitches” option.

  Typical examples are drum and percussion tracks, where different pitches usually correspond to separate drum sounds.

NOTE

When dissolving a part into either separate channels or separate pitches, you can automatically remove the silent (empty) areas of the resulting parts by activating the “Optimized Display” checkbox in the Dissolve Part dialog. This option is not available when “Dissolve to Lanes” is activated.

RELATED LINKS

Dissolving to lanes on page 770

Dissolving parts into separate channels

Setting a track to MIDI channel “Any” will cause each MIDI event to play back on its original MIDI channel, rather than a channel set for the whole track. There are two main situations when “Any” channel tracks are useful:

- When you record several MIDI channels at the same time.

  You may for example have a MIDI keyboard with several keyboard zones, where each zone sends MIDI on a separate channel. Recording on an “Any” channel track allows you to play back the recording with different sounds for each zone (since the different MIDI notes play back on separate MIDI channels).

- When you have imported a MIDI file of Type 0.

  MIDI files of Type 0 contain only one track, with notes on up to 16 different MIDI channels. If you were to set this track to a specific MIDI channel, all notes in the MIDI file would be played back with the same sound; setting the track to “Any” will cause the imported file to play back as intended.

The Dissolve Part function scans MIDI parts for events on different MIDI channels and distributes the events into new parts on new tracks, one for each MIDI channel found. This allows you to work with each musical part individually.

PROCEDURE

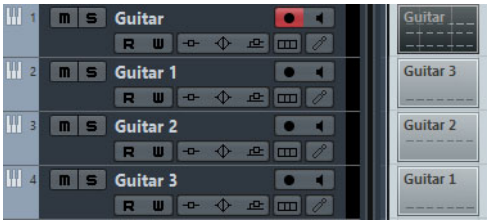
1. Select the parts containing MIDI data on different channels.
2. Select “Dissolve Part” from the MIDI menu.
3. In the dialog that opens, select the “Separate Channels” option.

RESULT

Now, for each MIDI channel used in the selected parts, a new MIDI track is created and set to the corresponding MIDI channel. Each event is then copied into the part on the track with the corresponding MIDI channel. Finally, the original parts are muted.

An example:

This part contains events on MIDI channels 1, 2, and 3.



Selecting “Dissolve Part” creates new parts on new tracks, set to channels 1, 2, and 3. Each new part contains only the events on the respective MIDI channel. The original MIDI part is muted.

Dissolving parts into separate pitches

The Dissolve Part function can also scan MIDI parts for events of different pitches, and distribute the events into new parts on new tracks, one for each pitch. This is useful when the different pitches are not used in a melodic context, but rather for separating different sounds (e.g. MIDI drum tracks or sampler sound FX tracks). By dissolving such parts, you can work with each sound individually, on a separate track.

PROCEDURE

1. Select the parts containing MIDI data.
2. Select “Dissolve Part” from the MIDI menu.
3. In the dialog that opens, select the “Separate Pitches” option.

   A new MIDI track is created for each used pitch in the selected parts. The events are then copied into the parts on the track for the corresponding pitch. Finally, the original parts are muted.

Dissolving to lanes

In the lower right section of the Dissolve Part dialog, you will find the “Dissolve to Lanes” option. When this is activated, the part will not be dissolved onto different tracks but onto different lanes of the original track, allowing for a better management of MIDI material that “belongs together”.

This is useful when working with drums for example, as it allows you to split up a part into different drum sounds and edit these independently. When you have made the desired modifications, you can reassemble all your drums into one part using the Bounce MIDI command, see below.

This option is especially handy when working with instrument parts on instrument tracks. “Normal” dissolving would lead to a number of different tracks each routed to a separate instance of the connected VST instrument. When dissolving parts to lanes, the parts will still reside on the same track, with all parts using the same VST instrument instance.

Bounce MIDI

With this function, you can combine MIDI parts on several lanes to a single MIDI part. This can be used to reassemble a drum part that you dissolved onto several lanes for editing, see above. Simply select the MIDI parts on the different lanes that you want to combine and select “Bounce MIDI” on the MIDI menu.

During the bounce process, any muted parts will be removed. If transpose and velocity values were specified for the parts, these are taken into account as well.

Repeat Loop

With this function, the events inside the independent track loops will be repeated until the end of the part, i.e. the notes that were previously only played repeatedly are now actual notes on the MIDI track. Events to the right of the independent track loop (within the same part) will be replaced by this function.

RELATED LINKS

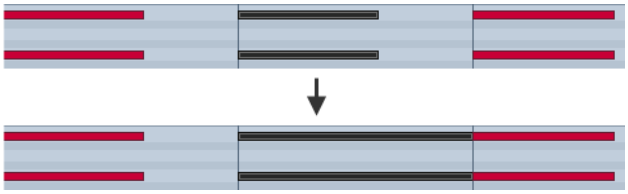
Setting Up the Independent Track Loop on page 569

Other MIDI functions

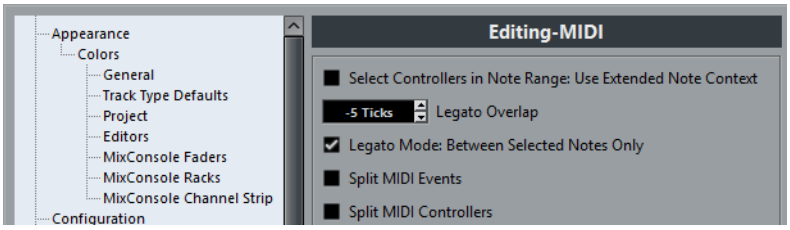
The following items can be found on the Functions submenu of the MIDI menu:

Legato

Extends each selected note so that it reaches the next note.



You can specify a gap or overlap for this function with the “Legato Overlap” setting in the Preferences dialog (Editing–MIDI page).



When using Legato with this setting, each note will be extended to end 5 ticks before the next note.

When you activate “Legato Mode: Between Selected Notes Only”, the length of the note will be adjusted so that it reaches the next selected note, allowing you to apply Legato only to your bass line, for example.

NOTE

You can also apply a legato using the “Scale Length/Legato” slider in the MIDI editors.

RELATED LINKS

Inspector on page 794

Fixed Lengths

This function resizes all selected notes to the length set with the Length Quantize pop-up menu on the MIDI editor toolbar.

Pedals to Note Length

This function scans for Sustain pedal on/off events, lengthens the affected notes to match the Sustain pedal off position, and then removes the Sustain Controller on/off events.

Delete Overlaps (mono)

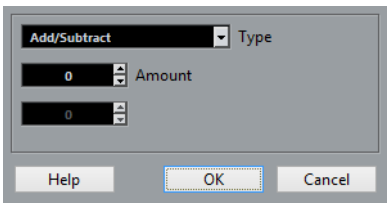
This function allows you to make sure that no notes of the same pitch overlap (i.e. that one starts before the other ends). Overlapping notes of the same pitch can confuse some MIDI instruments (a new Note On is transmitted before the Note Off is transmitted). This command can then be used to automatically solve the problem.

Delete Overlaps (poly)

This function shortens notes when required, so that no note begins before another ends. This happens regardless of which pitch the notes have.

Velocity

This function opens a dialog that allows you to manipulate the velocity of notes in various ways.



The following types of velocity processing are available:

Add/Subtract

This simply adds a fixed number to the existing velocity values. You set the value (positive or negative) with the Amount parameter.

Compress/Expand

Compresses or expands the “dynamic range” of MIDI notes by scaling the velocity values according to the Ratio setting (0 to 300%). The principle behind this is that multiplying different velocity values with a factor higher than 1 (over 100%) will also make the differences between velocity values greater, while using a factor lower than 1 (under 100%) will make the differences smaller. In short:

- To compress (“even out” velocity differences), use ratio values below 100%.

  After compression, you would probably want to add a velocity amount (with the Add/Subtract function) to maintain the average velocity level.

- To expand (create greater difference in velocity), use ratio values above 100%.

  Before you expand, you may want to adjust the velocity with the Add/Subtract function, so that the average velocity is somewhere in the middle of the range. If the average velocity is high (near 127) or low (near 0), expansion will not work properly, simply because velocity values can only be between 0 and 127!

Limit

This function allows you to make sure that no velocity values fall outside a given range (the Lower and Upper values). Any velocity values outside this range are raised/lowered to exactly the Lower/Upper values.

Fixed Velocity

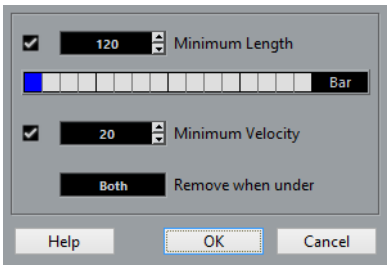
This function sets the velocity of all selected notes to the Insert Velocity value on the toolbar in the MIDI editors.

Delete Doubles

This function removes double notes, i.e. notes of the same pitch on the exact same position from the selected MIDI parts. Double notes can occur when recording in Cycle mode, after Quantizing, etc.

Delete Notes

Allows you to delete very short or weak notes. This is useful for automatically removing unwanted “ghost notes” after recording. Selecting “Delete Notes…” opens a dialog in which you set up the criteria for the function.



The parameters have the following functionality:

Minimum Length

When the Minimum Length checkbox is activated, the note length is taken into account, allowing you to remove short notes. You can either specify the minimum length (for notes to be kept) in the value field or by dragging the blue line in the graphical length display below.

- The graphical length display can correspond to 1/4 bar, one bar, two bars or four bars.
  You change this setting by clicking in the field to the right of the display.

In this case, the whole length display corresponds to two bars, and the Minimum Length is set to 32nd notes (60 ticks).

Minimum Velocity

When the Minimum Velocity checkbox is activated, the velocity of notes is taken into account, allowing you to remove weak notes. You specify the minimum velocity (for notes to be kept) in the value display.

Remove when under

This setting is only available when both Minimum Length and Minimum Velocity is activated. By clicking in this field, you select whether both the length and the velocity criteria must be met for notes to be deleted, or whether one of the criteria will suffice.

OK and Cancel

Clicking OK performs the automatic delete according to the rules set up. Clicking Cancel closes the dialog without deleting notes.

Delete Controllers

This function removes all MIDI controllers from the selected MIDI parts.

Delete Continuous Controllers

This function removes all “continuous” MIDI controller events from the selected MIDI parts. Therefore, “on/off” events such as sustain pedal events are not removed.

Restrict Polyphony

Selecting this item opens a dialog in which you can specify how many “voices” are used (for the selected notes or parts). Restricting the polyphony this way is useful when you have an instrument with limited polyphony and want to make sure all notes will be played. The effect is achieved by shortening notes as required, so that they end before the next note starts.

Thin Out Data

Thins out MIDI data. Use this to ease the load on your external MIDI devices if you have recorded very dense controller curves, etc.

NOTE

NEK only: This also thins out MIDI controller and VST 3 events that form part of Note Expression data.

You can also manually thin out the controller data by using the quantize function in the Key Editor.

Extract MIDI Automation

This is an extremely useful function as it allows you to quickly and easily convert the continuous controllers of your recorded MIDI parts into MIDI track automation data, making them available for editing in the Project window.

PROCEDURE

1. Select the desired MIDI part containing the continuous controller data.
2. On the MIDI menu, open the Functions submenu and select “Extract MIDI Automation”.
3. In the Project window, open the automation tracks for the respective MIDI track. You will find that an automation track has been created for each of the continuous controllers in the part.

RESULT

NOTE

In the MIDI editors, the controller data will automatically be removed from the controller lane.

This function can only be used for continuous controllers. Data such as Aftertouch, Pitchbend, or SysEx cannot be converted to MIDI track automation data.

NOTE

MIDI controller automation is also affected by the Automation Merge Mode.

RELATED LINKS

MIDI Controller Automation on page 687
Merge Tempo from Tapping on page 776

Reverse

This function inverts the order of the selected events (or of all events in the selected parts) rhythmically, causing the MIDI music to play backwards. Note that the effect is different from reversing an audio recording. With MIDI, the individual notes will still play as usual in the MIDI instrument – it is only the order of playback that is changed.

Mirror

This function inverts the order of the selected events (or of all events in the selected parts) graphically. Technically, this function turns a Note On message into a Note Off message and vice versa which can lead to rhythmic inaccurancies if the Note Off position of a note has not been quantized.

Merge Tempo from Tapping

This function allows you to create a complete tempo track based on your tapping.

MIDI Editors

There are several ways to edit MIDI in Nuendo. You can use the tools and functions in the **Project** window for large-scale editing or the functions on the **MIDI** menu to process MIDI parts in various ways. To manually edit your MIDI data on a graphical interface, you can use the MIDI editors.

- The **Key Editor** presents notes graphically in a piano roll-style grid. The **Key Editor** also allows for detailed editing of non-note events such as MIDI controllers.
- The **Score Editor** (NEK only) shows MIDI notes as a musical score and provides advanced tools and functions for notation, layout, and printing.
- The **Drum Editor** (NEK only) is similar to the **Key Editor**, but each key corresponds to a separate drum sound.

  You can use the **Drum Editor** to edit drum or percussion parts.
- The **List Editor** shows all events in the selected MIDI parts as a list and allows you to view and edit their properties numerically. It also allows you to edit SysEx messages.
- The **In-Place Editor** allows you to edit MIDI parts directly in the **Project** window so that you can edit MIDI in context with other track types.

  You can also edit MIDI in the Project Browser.

RELATED LINKS

Key Editor on page 788
Drum Editor (NEK only) on page 818
List Editor on page 837
Project Browser on page 1002
In-Place Editor on page 847

Opening MIDI editors

PROCEDURE

1. Do one of the following:
   - Select one or several MIDI parts.
   - Select a whole MIDI track without selecting parts.

2. Do one of the following:
   - To open the **Key Editor**, select a MIDI track/event and select **MIDI > Open Key Editor**.
   - To open the **Score Editor** (NEK only), select a MIDI track/event and select **MIDI > Open Score Editor**.
   - To open the **Drum Editor** (NEK only), select a MIDI track/event and select **MIDI > Open Drum Editor**.
   - To open the **List Editor**, select a MIDI track/event and select **MIDI > Open List Editor**.
   - To open the **In-Place Editor**, select a MIDI track/event and select **MIDI > Open In-Place Editor**.
   - To open the default MIDI editor, double-click a MIDI part.

RESULT

The selected editor opens and displays the selected parts or tracks. If no parts were selected, all parts on the track are shown.

Opening a Drum Map in the Drum Editor (NEK only)

You can automatically open a drum map in the **Drum Editor**.

- Select **File > Preferences > Event Display > MIDI** and activate **Edit as Drums when Drum Map is assigned**.

RELATED LINKS

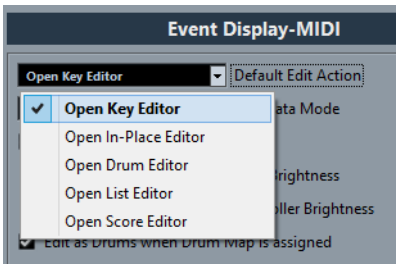
Selecting a Drum Map for a Track on page 834

Changing the Default MIDI Editor

When you double-click a MIDI part, the default MIDI editor opens. The **Key Editor** is the default MIDI editor. You can set any MIDI editor as the default MIDI editor.

PROCEDURE

1. Select **File > Preferences**.
2. Select **Event Display > MIDI**.
3. From the **Default Edit Action** pop-up menu, select the MIDI editor that you want to use.



4. Click **OK**.

Common MIDI Editor Functions

You can use the tools and functions within the MIDI editors to process MIDI parts in various ways.

Changing the Display Format for the Ruler

By default, the ruler shows the timeline in the display format that is selected on the transport panel.

You can change the display format for the ruler. Click the arrow button to the right of the ruler and select an option from the pop-up menu.

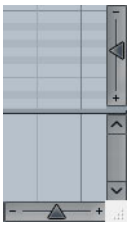
RELATED LINKS

Ruler Display Formats on page 49

Zooming in MIDI Editors

The MIDI editors provide several zooming options:

- Zoom sliders



- **Zoom** tool

- Select **Edit** > **Zoom**.

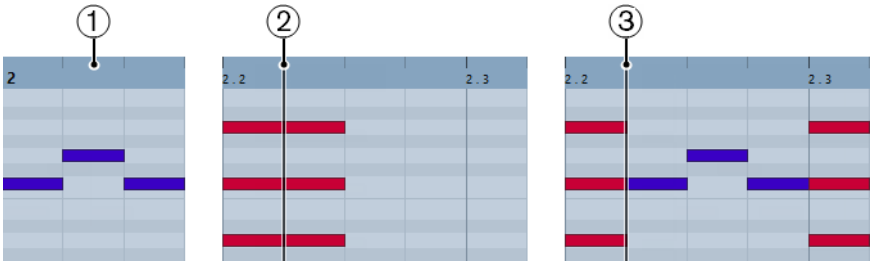
When you use the **Zoom** tool for zooming, you can determine if you want to zoom horizontal only or horizontal and vertical at a time.

- To activate/deactivate the corresponding option, select **File > Preferences > Editing > Tools** and activate/deactivate **Zoom Tool Standard Mode: Horizontal Zooming Only**.

Using Cut and Paste

You can use the **Cut**, **Copy**, and **Paste** options from the **Edit** menu to move or copy material within a part or between different parts.

- To insert note events at the project cursor position without affecting existing notes, select **Edit > Paste**.
- To insert note events at the project cursor position, move, and if necessary split the existing note events to make room for the pasted notes, select **Edit > Range > Paste Time**.



1) Data on clipboard
2) Cursor position
3) Pasted data at cursor position

Following the Project Cursor During Playback

Auto-Scroll allows the event display to scroll during playback, keeping the project cursor visible in the window.

Auto-Scroll in MIDI editors is independent of the Auto-Scroll function in the **Project Window**.

- To activate/deactivate Auto-Scroll, click **Auto-Scroll** .

Soloing a MIDI Editor

- To only hear the parts of a particular MIDI editor during playback, activate **Solo Editor** .

Acoustic Feedback

If **Acoustic Feedback** is activated, individual notes are automatically played back (auditioned) when you move or transpose them, or when you create new notes by drawing. This makes it easier to hear what you are doing.

- To use acoustic feedback, activate **Acoustic Feedback** on the toolbar of a MIDI editor.
- To take any MIDI sends or inserts that are used for the track into account when auditioning, select **File > Preferences > MIDI** and activate **Audition through MIDI Inserts/Sends**.

  This way, the acoustic feedback of the editors sends the MIDI data to the output that is selected for the track and additionally through any MIDI inserts and MIDI sends that are assigned to it. However, this also means that the MIDI events are sent through any MIDI plug-ins that are assigned to this track.

RELATED LINKS

MIDI on page 1265

Handling Note Events

Coloring Notes and Events

You can select different color schemes for the note events in the MIDI editor.

The following options are available on the **Event Colors** pop-up menu on the toolbar:

Velocity

The note events get different colors depending on their velocity values.

Pitch

The note events get different colors depending on their pitch.

Channel

The note events get different colors depending on their MIDI channel value.

Part

The note events get the same color as their corresponding part in the **Project** window. Use this option when you are working with two or more tracks in an editor, to see which note events belong to which track.

Grid Match

The note events get different colors depending on their time position. For example, this mode enables you to see if the notes of a chord start at the exact same beat.

Sound Slot (NEK only)

The note events get different colors depending on the articulation that has been assigned to the note in the **Expression Map Setup** dialog.

Voice (NEK only)

The note events get different colors depending on their voice (soprano, alto, tenor, etc.).

Chord Track (NEK only)

The note events get different colors depending on whether they match the current chord, scale, or both.

For all of the options except **Part**, the pop-up menu also contains a **Setup** option. This option opens a dialog in which you can specify the colors that are associated with velocities, pitches, or channels.

RELATED LINKS

Expression maps (NEK only) on page 854

Selecting Note Events

The selected MIDI editor determines which of the following methods apply.

Do one of the following:

- Use the **Object Selection** tool to drag a selection rectangle around the note events that you want to select. You can also click individual events.
- Select **Edit > Select** and select one of the options.
- To select the previous or next note event, use the left or right arrow keys.
- To select several notes, press [Shift] and use the arrow keys.
- To select all notes of a certain pitch, press [Ctrl]/[Command] and click on a key in the keyboard display to the left.
- To select all the following note events of the same pitch/staff, press [Shift] and double-click a note event.

RELATED LINKS

Selecting Note Events using the Select Submenu on page 782
Editing on page 1250

Selecting Note Events using the Select Submenu

The **Select** submenu offers you several options to select note events.

To open the **Select** submenu, select **Edit > Select**.

All

Selects all note events in the edited part.

None

Deselects all note events.

Invert

Inverts the selection. All selected note events are deselected and all notes that were not selected are selected instead.

In Loop

Selects all note events that are partially or completely inside the boundaries of the left and right locators (only visible if locators are set).

From Start to Cursor

Selects all note evens that begin to the left of the project cursor.

From Cursor to End

Selects all note events that end to the right of the project cursor.

Equal Pitch - all Octaves

Selects all note events of the highlighted part that have the same pitch (in any octave) as the currently selected note event.

NOTE

This function requires that a single note event is selected.

Equal Pitch - same Octave

Selects all note events of the highlighted part that have the same pitch (same octave) as the currently selected note event.

NOTE

This function requires that a single note event is selected.

Select Controllers in Note Range

Selects the MIDI controller data within the range of the selected note events.

RELATED LINKS

Deleting Note Events on page 784

Muting Note Events

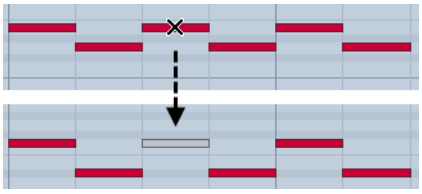
You can mute individual note events in a MIDI editor. Muting individual notes allows you to exclude note events from playback.

Do one of the following:

- Click on a note event with the **Mute** tool.
- Drag a rectangle with the **Mute** tool, enclosing all note events that you want to mute.
- Select the note events and select **Edit > Mute**.

- To unmute a note event, click it or enclose it with the **Mute** tool. You can also select a note event and select **Edit > Unmute**.

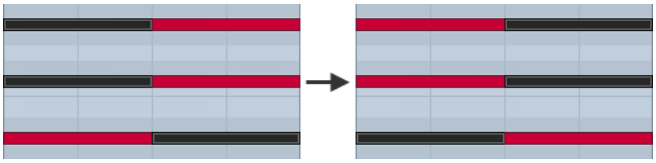
Muted notes are dimmed in the note display.



Toggle Selections

- To toggle selected elements within a selection rectangle, press [Ctrl]/[Command] and enclose the same elements within a new selection rectangle.

Once you release the mouse button, the previous selection is deselected and vice versa.



Deleting Note Events

- To delete note events, click on them with the **Erase** tool or select them and press [Backspace].

Cutting Note Events

The **Trim** tool allows you to cut off the end or the beginning of note events.

PROCEDURE

1. Select the **Trim** tool on the toolbar.
2. Do one of the following:
   - To trim the end of a single note event, click on the note event.
   - To trim the beginning of a single note event, press [Alt]/[Option] and click the note event.
   - To trim several note events, click and drag with the mouse across the note events.
   - To set the same start and end time for all edited note events, press [Ctrl]/[Command] and vertically drag along the note events.

Editing Note Events on the Info Line

You can move, resize, transpose, or change the velocity of note events on the info line using regular value editing.

- To apply a value change to all selected note events, press [Ctrl]/[Command] and change a value on the info line.
- To adjust the pitch or velocity of note events via your MIDI keyboard, click in the **Pitch** or **Velocity** fields on the info line, and play a note on your MIDI keyboard.

  If you have several note events selected and change a value, all selected events are changed by the set amount.

Duplicating and Repeating Note Events

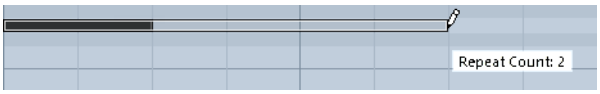
You can duplicate and repeat note events in the same way as events in the **Project** window.

- To duplicate the selected note events, hold down [Alt]/[Option] and drag the note events to a new position.

  If **Snap** is activated, it determines to which positions you can copy notes.
- To copy the selected note events and place them directly behind the original, select **Edit > Functions > Duplicate**.

  If several note events are selected, all of them are copied as one unit, maintaining the relative distance between the note events.
- To create a number of copies of the selected note events, select **Edit > Functions > Repeat**, specify the number, and click **OK**.

  You can also press [Alt]/[Option] and drag the right edge of the note events to the right to create copies of the note events.



RELATED LINKS

About snapping on page 993

Finding Exact Positions with Snap

The Snap function restricts horizontal movement and positioning to certain positions. This helps you find exact positions in the note display when editing note events in a MIDI editor. Affected operations include moving, duplicating, drawing, sizing, etc.

- To activate/deactivate snap, click **Snap** .

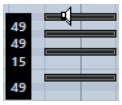
  If you select the **Bars+Beats** display format, the snap grid is set by the quantize value on the toolbar. This makes it possible to snap to straight note values and to swing grids that have been set up in the **Quantize Panel**.

If you select any of the other display formats, positioning is restricted to the displayed grid.

Setting Velocity Values

When you draw note events in the MIDI editor, the note events get the velocity value that is set in the **Insert Velocity** field on the toolbar. There are different methods to set the velocity.

- Use the **Edit Velocity** tool modifier. The cursor changes into a speaker, and next to the note, a field with the Note Velocity slider shows the value. Move the mouse pointer up or down to change the value.

  Value changes are applied to all selected notes.

  For this, a tool modifier must be assigned for the **Edit Velocity** action. To see or edit the tool modifier, select **File > Preferences > Editing > Tool Modifiers > Select Tool**.

- Open the **Insert Velocity** pop-up menu and select a velocity value.

  On this menu, you can also select **Setup** and specify custom velocity values for the pop-up menu.

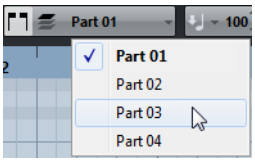
- Double-click the **Insert Velocity** field on the toolbar and enter a velocity value.

- Assign key commands to **Insert Velocity 1-5** and use them.

  This allows you to quickly switch between different velocity values when you enter note events.

Handling Several MIDI Parts

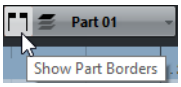
- To activate a part for editing, open the **Currently Edited Part** menu and select a part.

  When you select a part from the list, it is automatically active and centered in the note display.

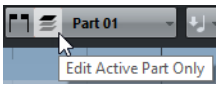
- To zoom in on an active part, select **Edit > Zoom > Zoom to Event**.

- To display defined borders for the active part, activate **Show Part Borders**.

  If this option is activated, all parts, except the active part, are grayed out.

- To restrict editing operations to the active part, activate **Edit Active Part Only**.



- To change the size of the part, drag the part borders.

  The part borders display the name of the active part.

NOTE

If the part that you open for editing is a shared copy, any editing that you perform affects all shared copies of this part. In the **Project** window, shared copies are indicated by an equal sign in the top right corner of the part.

Looping MIDI Parts

The **Independent Track Loop** function allows you to loop a MIDI part independent from the project playback.

When you activate the loop, the MIDI events within the loop are repeated continuously while other events on other tracks are played back as usual. Every time the cycle restarts, the independent track loop also restarts.

PROCEDURE

1. Activate **Independent Track Loop** on the toolbar.

   If the **Independent Track Loop** button is not visible, right-click the toolbar and select **Independent Track Loop** from the menu.

   If you have set up a loop range in the **Project** window, it is hidden from the ruler in the MIDI editor.
2. [Ctrl]/[Command]-click in the ruler to specify the start of the independent track loop.
3. [Alt]/[Option]-click in the ruler to specify the end of the independent track loop.

RESULT

The independent loop range is indicated in a different color.

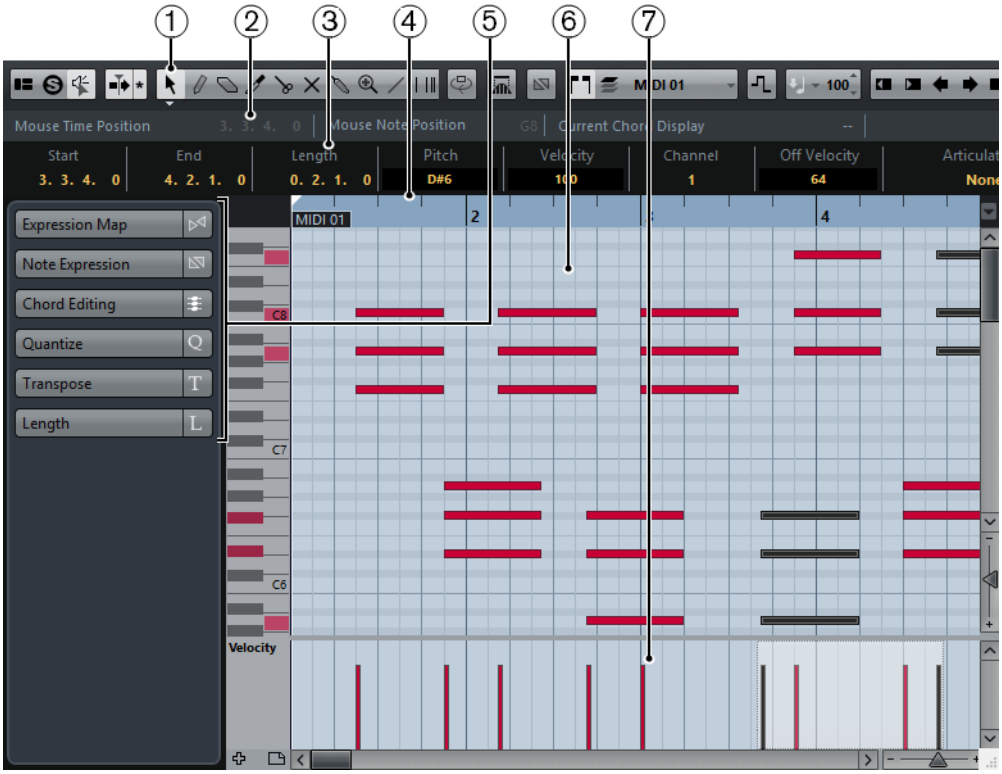
The start and end of the loop range are displayed on the status line.

AFTER COMPLETING THIS TASK

To repeat the events of the loop range and fill up the active MIDI part select **MIDI > Repeat Loop**.

Key Editor

The **Key Editor** is the default MIDI editor. It displays notes graphically in a piano roll-style grid. The **Key Editor** allows for detailed editing of notes and non-note events, such as MIDI controllers.



1) **Toolbar**
Contains tools and settings.

2) **Status line**
Informs about the mouse time position, mouse note position, and current chord display.

3) **Info line**
Displays note event information about a selected MIDI note.

4) **Ruler**
Displays the time line.

5) **Key Editor Inspector**
Contains tools and functions for working with MIDI data.

6) **Note display**
Contains a grid in which MIDI notes are displayed as boxes.

7) **Controller display**
The area below the note display consists of one or multiple controller lanes.

Toolbar

The toolbar contains tools and settings for the **Key Editor**.

- To show or hide the toolbar elements, right-click the toolbar and activate or deactivate the elements.

Static Buttons

Set up Window Layout

Allows you to show/hide specific window sections, for example, the **Status Line**, the **Info Line**, the **Inspector**, etc. Which sections are available, depends on the MIDI editor.

Solo Editor

If this button is activated, you hear only the edited MIDI parts during playback.

Acoustic Feedback

If this button is activated, individual notes are automatically played back when you move or transpose them, or when you create them by drawing.

Auto Scroll

Auto Scroll

If this button is activated, the project cursor is always visible in the window.

Tool Buttons

Object Selection

Allows you to select events.

Draw

Allows you to draw events.

Erase

Allows you to delete events.

Trim

Allows you to resize selected events by moving their start or end positions in steps according to the **Length Quantize** value.

Split

Allows you to split a MIDI event.

Mute

Allows you to mute events.

Glue

Allows you to glue together events of the same pitch.

Zoom

Allows you to zoom in/out. Hold [Alt]/[Option] and click to zoom out.

Line

Allows you to create a series of contiguous events.

Time Warp

Allows you to adjust the tempo track so that material with a musical time base can be matched to material with a linear time base.

Independent Track Loop

Independent Track Loop

Activates/Deactivates the independent track loop for the edited part.

Auto Select Controllers

Auto Select Controllers

If this button is activated and a note is selected in the editor, the corresponding controller data is also automatically selected.

Show Note Expression Data

Show Note Expression Data

If this button is activated, Note Expression data is shown.

Multiple Part Controls

Show Part Borders

If this button is activated, the part borders are shown in the editor.

Edit Active Part Only

If this button is activated, editing operations are applied only to the active part.

Currently Edited Part

MIDI 01

This pop-up menu lists all parts that are currently open in the editor. This allows you to select a part for editing.

Indicate Transpositions

Indicate Transpositions

If this button is activated, MIDI notes are displayed according to their transposition settings.

Insert Velocity

Insert Velocity

100

Allows you to specify a velocity value for new notes.

Nudge Palette

Trim Start Left

Increases the length of the selected element by moving its start to the left.

Trim Start Right

Decreases the length of the selected element by moving its start to the right.

Move Left

Moves the selected element to the left.

Move Right

Moves the selected element to the right.

Trim End Left

Decreases the length of the selected element by moving its end to the left.

Trim End Right

Increases the length of the selected element by moving its end to the right.

Transpose Palette

Move up

Transposes the selected event or chord up by a half note.

Move down

Transposes the selected event or chord down by a half note.

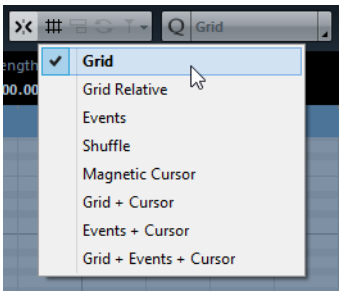
Move up more

Transposes the selected event up by an octave.

Move down more

Transposes the selected event down by an octave.

Snap/Quantize



The following options are available on the **Snap/Quantize** menu:

Snap On/Off

Activates/Deactivates the snap function.

Grid

If this option is activated, the snap positions are set with the **Grid Type** pop-up menu. The available options depend on the display format selected for the ruler.

Grid Relative

If this option is activated, events keep their relative positions to the grid when they are moved.

Events

If this option is activated, the start and end positions of other events and parts are magnetic. This means that if you drag an event to a position near the start or end of another event, it is automatically aligned with the start or end of the other event.

Shuffle

Shuffle allows you to change the order of adjacent events. If you drag the first one to the right, past the second event, the two events change places.

Magnetic Cursor

If this option is activated, the project cursor is magnetic. When you drag an event near the cursor, the event is aligned with the cursor position.

Grid + Cursor

This is a combination of **Grid** and **Magnetic Cursor**.

Events + Cursor

This is a combination of **Events** and **Magnetic Cursor**.

Grid + Events + Cursor

This is a combination of **Events**, **Grid**, and **Magnetic Cursor**.

Iterative Quantize On/Off

Activates/Deactivates iterative quantize.

Quantize Presets

Allows you to select a quantize or a groove preset.

Apply Quantize

Applies the quantize settings.

Open Quantize Panel

Opens the **Quantize Panel**.

Step/MIDI Input

Step Input

Activates/Deactivates the **Step Input** mode.

MIDI Input/Note Expression MIDI Input

Activates/Deactivates **MIDI Input** modes.

Move Insert Mode

Activates/Deactivates the **Move Insert** mode. For this function, **Step Input** must be activated.

Record Pitch

If **Step Input** is activated, use this button to determine that the pitch is included when you insert notes.

Record NoteOn Velocity

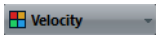
If **Step Input** is activated, use this button to determine that NoteOn Velocity is included when you insert notes.

Record NoteOff Velocity

If **Step Input** is activated, use this button to determine that NoteOff Velocity is included when you insert notes.

Event Colors

Event Colors



Allows you to select a color scheme for the events in the editor.

Hide Colors

Allows you to hide the colors.

Edit VST Instrument

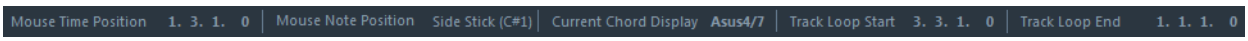
Edit VST Instrument

If the track is routed to a VST instrument, use this button to open the VST Instrument panel.

Status Line

The status line is displayed below the toolbar. It displays important information about the mouse position.

To show or hide the status line, click **Set up Window Layout** on the toolbar, and activate or deactivate **Status Line**.



Mouse Time Position

Displays the exact time position of the mouse pointer, depending on the selected ruler display format. This lets you edit or insert notes at exact positions.

Mouse Note Position

Displays the exact pitch of the mouse pointer position. This facilitates finding the right pitch when entering or transposing notes.

Current Chord Display

When the project cursor is positioned over notes that form a chord, the chord is displayed here.

Independent Track Loop

A mini-cycle, affecting only the MIDI part that is being edited. If **Independent Track Loop** is activated, MIDI events within the loop range are repeated continuously.

RELATED LINKS

Setting Up the Independent Track Loop on page 569

Info Line

The info line shows values and properties of the selected events. If several notes are selected, the values for the first note are displayed in color.

To show or hide the info line, click the **Set up Window Layout** button on the toolbar, and activate or deactivate **Info Line**.

Length and position values are displayed in the selected ruler display format.

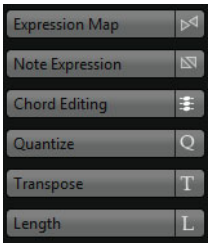
NEK only: In the Note Expression editor, the info line shows information about the selected Note Expression events.

RELATED LINKS

Editing Note Events on the Info Line on page 785
Changing the Display Format for the Ruler on page 779

Inspector

In a MIDI editor, the inspector is located left of the note display. The inspector contains tools and functions for working with MIDI data.



Expression Map (NEK only)

Allows you to load an expression map. Expression maps are useful for working with articulations.

Note Expression (NEK only)

Contains functions and settings related to Note Expression.

Chord Editing (NEK only)

Allows you to enter chords instead of single notes.

Quantize

Allows you to access the main quantize parameters. These are identical with the functions on the **Quantize** panel.

Transpose

Allows you to access the main parameters for transposing MIDI events.

Length

Contains length-related options, similar to the **Functions** submenu of the **MIDI** menu.

- To change the length of the selected MIDI events or all events of the active part if no events are selected, use the **Scale Length/Legato** slider.

  At the maximum value the notes reach the beginning of the next note.

- To make the new length settings permanent, use the **Freeze MIDI Lengths** button to the right of the **Scale Length/Legato** slider.

- To fine-tune the distance between consecutive notes, use the **Overlap** slider.

  At **0 Ticks**, the **Scale Legato** slider extends each note so that it reaches the next note exactly. Positive values cause the notes to overlap and negative values allow you to define a small gap between the notes.

- To use the **Legato** function or slider to extend a note until the next selected note, activate **Between Selected**.

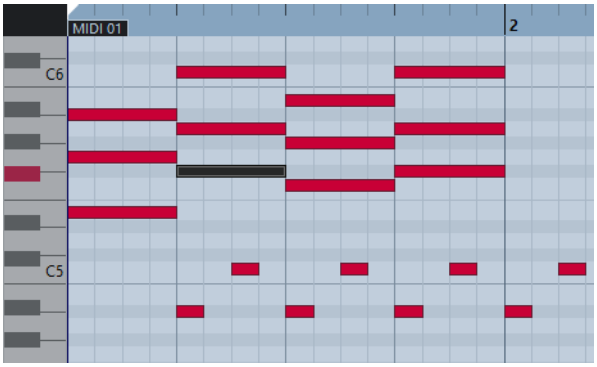
  This is identical with activating the **Legato Mode: Between Selected Notes Only** option in the **Preferences** dialog.

RELATED LINKS

Expression maps (NEK only) on page 854
Setting up the Note Expression Inspector tab on page 870
Quantize Panel on page 265
Transpose Functions on page 301
Other MIDI functions on page 771

Note Display

The note display is the main area in the **Key Editor**. It contains a grid in which note events are shown as boxes.



The width of a box corresponds to the note length. The vertical position of a box corresponds to the note number (pitch), with higher note events higher up in the grid. The piano keyboard helps you to find the right note number.

Controller Display

The area at the bottom of the **Key Editor** window is the controller display. It contains the controller events.

The controller display consists of one or several controller lanes that show one of the following properties or event types:

- Velocity values of the notes
- **Pitchbend** events
- **Aftertouch** events
- **Poly Pressure** events
- **Program Change** events
- **System Exclusive** events
- **Articulations and Dynamics**
- Any type of continuous controller event

Velocity values are shown as vertical bars in the controller display. Each velocity bar corresponds to a note event in the note display. Higher bars correspond to higher velocity values.

Events other than velocity values are shown as blocks. The block corresponds to the event values. The beginning of an event is marked by a curve point.

NOTE

Unlike note events, controller events have no length. The value of a controller event in the display is valid until the beginning of the next controller event.

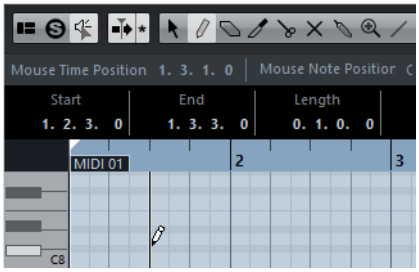
Key Editor Operations

This section describes the principal editing operations within the **Key Editor**.

Drawing Note Events with the Draw Tool

The **Draw** tool allows you to insert single note events in the note display. The horizontal position of the note event corresponds to the time, the vertical position to the pitch.

When you move the cursor inside the note display, its position is indicated on the status line. Its pitch is indicated both on the status line and on the piano keyboard to the left.



- To draw a note, click in the note display.

  The note event has the length that is set on the **Length Quantize** pop-up menu.

- To draw longer note events, click and drag in the note display.

  The length of the note event is a multiple of the Length Quantize value. If **Length Quantize** is set to **Quantize Link**, the note value is determined by the quantize grid. The Snap function is taken into account.

Drawing Note Events with the Line Tool

In the note display, the **Line** tool allows you to draw a series of contiguous note events along different line shapes.

- To create contiguous note events, click and drag in the note display.
- To restrict movement to horizontal, press [Ctrl]/[Command] and drag.

  The notes have the same pitch.

If **Snap** is activated, the note events and controller events are positioned and sized according to the **Quantize** and **Length Quantize** values.

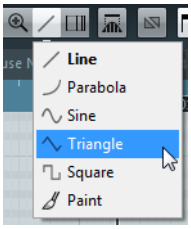
RELATED LINKS

The Line Tool Modes on page 798

The Line Tool Modes

The **Line** tool allows you to create a series of contiguous note events along different line shapes. You can also edit multiple controller events simultaneously.

To select a different line mode, click the **Line** button and select a mode from the menu.



The following line modes are available:

Line

If this option is activated, you can click and drag to insert note events in the note display along a straight line in any angle. Use this option to edit controller data along a straight line in the controller display.

Parabola, Sine, Triangle, Square

These modes insert note events along different curve shapes.

Paint

This mode allows you to insert note events by painting in the note display.

Moving and Transposing Note Events

There are several options to move and transpose note events.

- To move note events in the editor, select the **Object Selection** tool and drag them to a new position.

  All selected note events are moved, maintaining their relative positions. **Snap** is taken into account.

- To allow only horizontal and vertical movement, hold down [Ctrl]/[Command] while dragging.
- To move note events via the **Nudge Palette** buttons on the toolbar, select the note events and click a **Nudge Palette** button.

  This moves the selected note events by the amount that is set on the **Quantize** pop-up menu.

- To move note events to the project cursor position, select the note events and select **Edit > Move to > Cursor**.
- To move a note event via the info line, select a note event and edit the **Position** or **Pitch** on the info line.
- To transpose note events, select the note events and use the **Transpose Palette** buttons on the toolbar or the up and down arrow keys.

  Transpose is also affected by the global transpose setting.

- To transpose note events via the **Transpose Setup** dialog, select the note events and select **MIDI > Transpose Setup**.
- To transpose note events in steps of one octave, press [Shift] and use the up and down arrow keys.

NOTE

- When you move selected note events to a different position, any selected controllers for these note events move accordingly.
- You can also adjust the position of note events by quantizing.

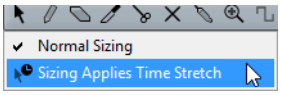
RELATED LINKS

Transpose on page 764

Resizing Note Events

Do one of the following:

- To resize the note event, position the **Object Selection** tool at the start or the end of a note event and drag the mouse cursor to the left or right.
- To apply time-stretching and Note Expression data (NEK only) to a controller that is associated with the note event that you resize, activate **Sizing Applies Time Stretch** for the **Object Selection** tool before you resize the note.



- To move the start or end positions of the selected notes in steps according to the **Length Quantize** value on the toolbar, use the **Trim Start/End** buttons on the **Nudge** palette.
- Select the note and adjust its length on the info line.
- Select the **Draw** tool and drag left or right within the note display to draw a note.

  The resulting note event length is a multiple of the **Length Quantize** value on the toolbar.
- Select the **Trim** tool and cut off the end or the beginning of note events.

RELATED LINKS

Using the Setup options on page 1226
Editing in the Info Line on page 48
Using the Trim Tool on page 800
Resizing Events Using Time Stretch on page 202

Using the Trim Tool

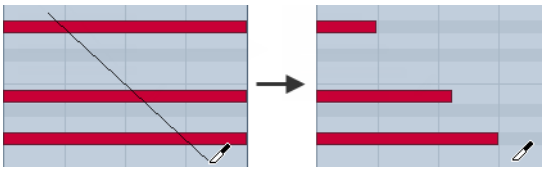
The Trim tool allows you to change the length of note events by cutting off the end or the beginning of notes. Using the Trim tool means moving the note-on or the note-off event for one or several notes to a position defined with the mouse.

PROCEDURE

1. Select the **Trim** button on the toolbar.

   The mouse pointer changes to a knife symbol.
2. To edit a single note, click on it with the **Trim** tool.

   The range between the mouse pointer and the end of the note will be removed. Use the mouse note info on the status line to find the exact position for the trim operation.
3. To edit several notes, click and drag with the mouse across the notes.



By default, the Trim tool cuts off the end of notes. To trim the beginning of notes, press [Alt]/[Option] while dragging. When dragged across several notes, a line is displayed. The notes will be trimmed along this line. If you press [Ctrl]/[Command] while dragging, you will get a vertical trim line, allowing you to set the same start or end time for all edited notes. You can change the Trim tool key commands in the Preferences dialog (Editing–Tool Modifiers page).

Splitting Note Events

- To split the note at the position that you point, click on a note with the **Split** tool.

  If several notes are selected, they are all split at the same position. The snap setting is taken into account.

- To split all notes that are intersected by the project cursor position, select **Edit > Functions > Split at Cursor**.
- To split all notes that are intersected by the left or right locator at the locator positions, select **Edit > Functions > Split Loop**.

Gluing Note Events

You can glue together note events of same pitch.

- To glue note events, select the **Glue** tool and click on a note event.

  The note event is glued together with the next note event of the same pitch. The result is a long note event that spans from the start of the first note to the end of the second note and with the properties (velocity, pitch, etc.) of the first note event.

Changing the Pitch of Chords (NEK only)

You can use the chord type buttons to change the pitch of chords.

PROCEDURE

1. In the **Inspector**, open the **Chord Editing** section.
2. In the note display, select the notes that you want to edit.

   If the chord is recognized, the root note, chord type, and tensions are indicated in the **Chord Type** field. This also works with arpeggiated notes.
3. In the **Chord Editing** section, activate one of the **Triads** buttons or **4-Note Chords** buttons.

   The selected notes are transposed so that they fit the selected chord type.
4. Use the up or down arrow keys on your computer keyboard to change the pitch of the chord.

Changing the Voicing of Chords (NEK only)

PROCEDURE

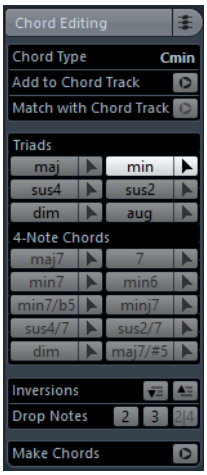
1. In the **Inspector**, open the **Chord Editing** section.
2. In the note display, select the notes that you want to edit.
3. In the **Chord Editing** section, use the **Inversions** buttons and the **Drop Notes** buttons to change the voicing.

RESULT

The selected notes are transposed so that they fit the selected chord type.

Chord Editing Section (NEK only)

The **Chord Editing** section in the **Inspector** allows you to insert and edit chords, and change voicings.



Chord Type

Shows the chord type of the selected chords.

Add to Chord Track

Adds the chord indicated in the **Chord Type** field to the chord track. The chord event is inserted at the position on the chord track that corresponds to the position of the MIDI notes. Any existing chord events at this position are overwritten.

Match with Chord Track

Applies the chord events from the chord track to the selected notes in the MIDI editor. The chord event that is effective at the position of the first selected note is applied to the selected notes, which are then transposed. Only the basic chord type is applied. Tensions are not taken into account.

Only the first effective chord event is applied.

Triads

Allows you to insert triads to the note display. You can also click one of the **Triads** buttons to transpose the selected notes so that they fit to the selected chord type.

4-Note Chords

Allows you to insert 4-note chords to the note display. You can also click one of the **4-Note Chords** buttons to transpose the selected notes so that they fit to the selected chord type.

Inversions - Move highest note to bottom

Inverts the highest note of a chord. The corresponding notes are transposed by as many octaves as needed.

Inversions - Move lowest note to top

Inverts the lowest note of a chord. The corresponding notes are transposed by as many octaves as needed.

Drop Notes - Move the second highest note an octave lower

Moves the second highest note of a chord down by one octave.

Drop Notes - Move the third highest note an octave lower

Moves the third highest note of a chord down by one octave.

Drop Notes - Move the second and fourth highest notes an octave lower

Moves the second and fourth highest notes of a chord down by one octave.

Make Chords

Performs a chord analysis of the selected notes. If nothing is selected, the whole MIDI part is analyzed.

Inserting Chords (NEK only)

You can use the tools in the **Chord Editing** section of the **Inspector** to insert and edit chords.

PROCEDURE

1. In the Inspector, open the **Chord Editing** section.
2. Select the insert **Tool** to the right of the chord type that you want to insert.
3. Click in the note display, drag to the left or right to determine the length of the chord. Drag up or down to determine its pitch.

   To change the chord type while you insert chords, hold [Alt]/[Option] and drag up or down.

   If **Acoustic Feedback** is activated, you hear the chord while dragging. A tooltip indicates the root note and chord type of the inserted chord. **Snap** and **Length Quantize** are taken into account.

Applying Chord Events to Note Events (NEK only)

You can apply chord events from the chord track to notes in the MIDI editor.

PREREQUISITE

Create a chord track and add chord events.

PROCEDURE

1. Open the MIDI editor.
2. In the **Inspector**, open the **Chord Editing** section.
3. Select **Match with Chord Track**.

RESULT

The first chord event of the chord track is applied to the selected notes. Only the basic chord type is applied. Tensions are not taken into account.

Drum Map Handling (NEK only)

When a drum map is assigned to a MIDI or instrument track, the **Key Editor** displays the drum sound names as defined by the drum map. This allows you to use the **Key Editor** for drum editing, for example, when editing drum note lengths or when editing several parts to identify drum events.

The name of the drum sound is displayed in the following locations:

- On the info line in the **Pitch** field.
- On the status line in the **Mouse Note Position** field.
- In the note event if the zoom factor is high enough.
- When dragging a note event.

Expression Map Handling (NEK only)

When an expression map is assigned to a MIDI track, the musical articulations that are defined for that map are displayed in the following locations of the **Key Editor**:

- On the info line in the **Articulations** field.
- On the controller lane.
- In the note event if the vertical zoom factor is high enough.

Note Expression Data (NEK only)

The **Key Editor** is the main editor for working with Note Expression.

RELATED LINKS

Expression maps (NEK only) on page 854

Editing Note Events via MIDI

Since you can directly hear your editing results. Editing the properties of note events via MIDI can be a quick way to, for example, set the velocity value of a note event.

PROCEDURE

1. In the **Key Editor**, select the note event that you want to edit.
2. Click **MIDI Input** on the toolbar.

   Editing via MIDI is enabled.
3. Use the note buttons on the toolbar to decide which properties are changed by the MIDI input.

   You can enable editing of pitch, note-on and/or note-off velocity. For example, with the following setting, the edited notes get the pitch and velocity values of the notes input via MIDI, but the note-off velocities remain as they are.

   
4. Play a note on your MIDI instrument.

RESULT

The selected note gets the pitch, velocity and/or note-off velocity of the played note. The next note in the edited part is automatically selected, to allow quick editing of a series of notes.

AFTER COMPLETING THIS TASK

To try another setting, select the note again and play a note on your MIDI instrument.

Step Input

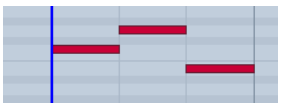
Step input, or step recording, allows you to enter note events or chords one at a time without worrying about the exact timing. This is useful, for example, when you know the part that you want to record but are not able to play it exactly as you want it.

PROCEDURE

1. On the toolbar, activate the **Step Input** button.
2. Use the note buttons to the right to determine which properties are included when you insert the note events.

   For example, you can include the velocity and/or note-off velocity of the played notes. You can also deactivate the pitch property, in which case all notes get a pitch C3, no matter what you play.
3. Click anywhere in the note display to set the start position of the first note event or chord.

   The step input position is shown as a blue line in the note display.

   
4. Specify the note event spacing and length with the **Quantize** and **Length Quantize** pop-up menus.

   The note events that you insert are positioned according to the **Quantize** value and have the length of the **Length Quantize** value.

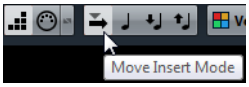
   NOTE

   If **Length Quantize** is set to **Quantize Link**, the note length is also determined by the **Quantize** value.
5. Play the first note event or chord on your MIDI instrument.

   The note event or chord appears in the editor and the step input position advances by one quantize value step.

   NOTE

   If **Move Insert Mode** is activated, all note events to the right of the step input position are moved to make room for the inserted note event or chord.

6. Continue in the same way with the rest of the note events or chords.

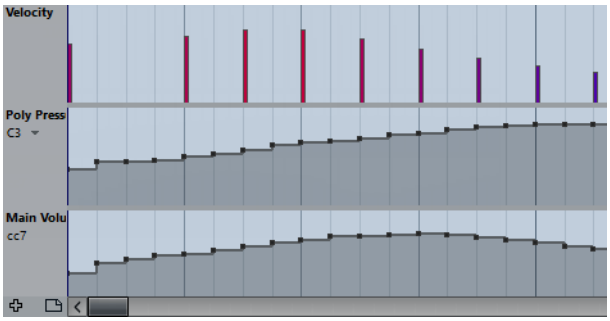
   You can adjust the **Quantize** or **Length Quantize** values, to change the timing or note event lengths. You can also move the step input position manually by clicking anywhere in the note display.

   To insert a rest, press the right arrow key on the computer keyboard. This advances the step input position by one step.
7. When you are done, click the **Step Input** button again to deactivate step input.

Using the Controller Display

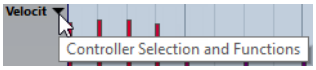
The Controller Display displays the controller events. By default, the controller display has a single lane that shows one event type at a time. However, you can add as many lanes as you need. The use of several controller lanes allows you to view and edit different controllers at the same time.

Each MIDI track has its own controller lane setup (number of lanes and selected event types). When you create new tracks, they get the last used controller lane setup.



The controller display with three lanes.

- To add a controller lane, click the **Create Controller Lane** button or open the **Controller Selection and Functions** menu and select **Create Controller Lane**.



- To remove a controller lane, open the **Controller Selection and Functions** pop-up menu and select **Remove this Lane**.

  This hides the lane from view. It does not affect the events in any way.

  If you remove all lanes, the controller display is hidden. To bring it back, click the **Create Controller Lane** button.

- To show/hide multiple lanes, open the **Controller Lane Setup** pop-up menu, and select **Show/Hide Controller Lanes**.

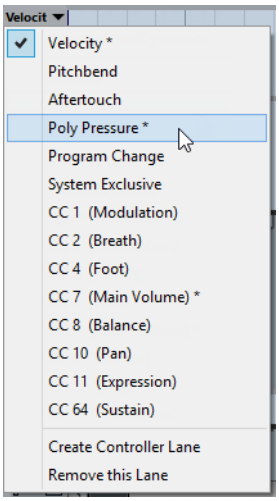
- To reset the controller display to show only the velocity lane, open the **Controller Lane Setup** pop-up menu, and select **Velocity only**.

- To automatically show all controller lanes with controller data, open the **Controller Lane Setup** pop-up menu, and select **Show Used Controllers**.

Selecting the Event Type

Each controller lane shows one event type at a time. You can select which event type to display on a controller lane.

- To select which type is displayed, open the **Controller Selection and Functions** pop-up menu and select an event type.



Setting up Available Continuous Controllers

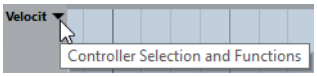
In the **MIDI Controller Setup** dialog, you can specify which continuous controllers are available for selection.

NOTE

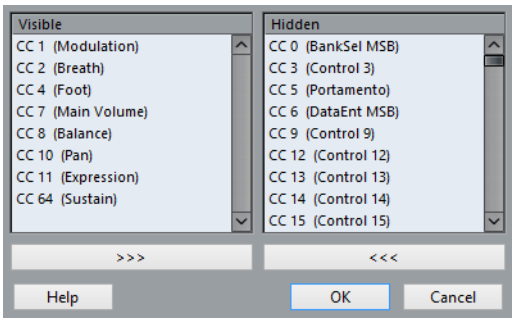
The **MIDI Controller Setup** dialog can be opened from different areas in the program. The settings are global, that is, the setup you choose here affects all areas of the program where MIDI controllers can be selected.

PROCEDURE

1. Select **Controller Selection and Functions > Setup**.



2. In the **MIDI Controller Setup** dialog, move all the controllers that you need to the list on the left and move the controllers that you do not need to the list on the right.



3. Click **OK**.

Handling Controller Lane Presets

Once you have made up your controller lane setup, you can save it as a controller lane preset. For example, you can have a preset with one velocity lane and another preset with a combination of several controller lanes, such as velocity, pitchbend, or modulation.

Saving a Controller Lane Setup as Preset

You can save a controller lane setup via the **Controller Lane Setup** pop-up menu.

PROCEDURE

1. Click the **Controller Lane Setup** button .
2. Select **Add Preset**.
   The **Type In Preset Name** dialog opens.
3. Enter a name for the preset.
4. Click **OK**.

RESULT

Your controller lane setup is now available as a controller lane preset.

NOTE

To apply a saved preset, open the **Controller Lane Setup** pop-up menu and select the preset.

NOTE

To remove or rename a preset, open the **Controller Lane Setup** pop-up menu and select **Organize Presets**. A dialog opens, where you can remove and rename presets.

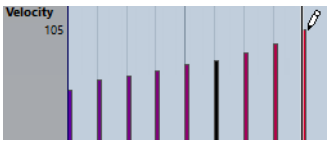
Adding Events in the Controller Display

- To create a new event in the velocity controller display, click with the **Draw** tool or the **Line** tool in the event display.
- To create a new event for any other event type, click with the **Draw** tool or the **Line** tool in the controller display.

Editing Events in the Controller Display

All controller values can be edited with the **Draw** tool or the **Line** tool. If you have selected more than one controller event on a controller lane, the controller lane editor is displayed.

- To edit events in the velocity controller display, use the **Draw** tool or the **Line** tool and drag the event.

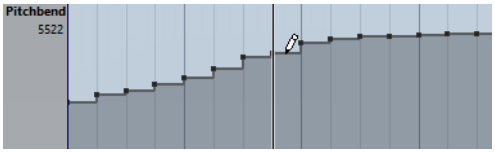
  

  The **Object Selection** tool automatically switches to the **Draw** tool when you move the pointer into the controller display.

  When you move the pointer in the controller lane, the corresponding event type value is displayed below the event type name.

  In velocity mode, no new controller events are added this way.

- To edit the values of any other event type in the controller display, press [Alt]/[Option] and drag, or use the **Draw** tool or the **Line** tool and drag.

  When you move the pointer inside a controller lane, the event type value changes corresponding to the pointer movement. The event type value is displayed below the event type name, left of the controller display.

- If there is more than one note at the same position, their velocity bars overlap on the controller lane. If none of the notes are selected, all notes at the same position are set to the same velocity value when you draw.

  To edit the velocity of only one of the notes at the same position, first select the note in the note display.

- To select all events on a controller lane, open the **Controller Lane Setup** pop-up menu and select the **Select all Controller Events** option.

- To use the **Object Selection** tool to select events in the velocity controller display, press [Alt]/[Option].

- To cut, copy, and paste events in the controller display select the event and select **Edit > Cut/Copy/Paste**.

  When pasting events, the events on the clipboard are added, starting at the project cursor position and maintaining their relative distances. If a pasted event ends up at the same position as an existing event of the same type, the old event is replaced.

NOTE

If the speaker icon (Acoustic Feedback) is activated on the toolbar, the notes are played back when you adjust the velocity. This allows you to audition your changes.

RELATED LINKS

Controller Lane Editor on page 816

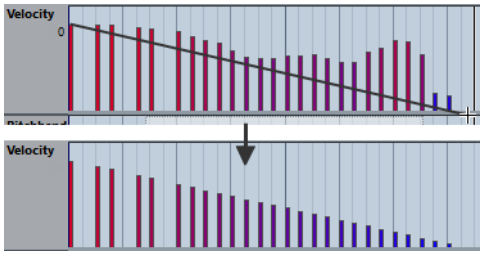
Editing Events in the Controller Display Using the Line Tool

You can draw and edit events in the controller display with the **Line** tool.

Line Mode

In **Line** mode, you can draw events in a straight line.

- To draw a straight line in the controller display, click where you want the ramp to start and drag the cursor to where you want the ramp to end.

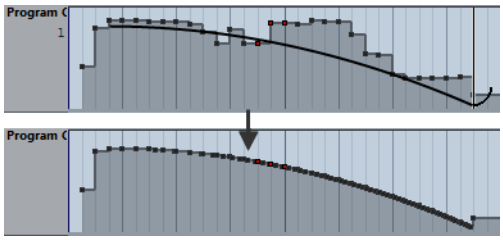


NOTE

If **Snap** is activated the **Length Quantize** value determines the density of created controller curves. For very smooth curves, use a small **Length Quantize** value or deactivate **Snap**. To avoid over-dense controller curves, which can cause MIDI playback to stutter, use a medium-low density.

Parabola Mode

In **Parabola** mode, you can draw events on a parabola curve. This gives more natural curves and fades. The result depends on the direction from which you draw the parabola.



You can use modifier keys to determine the shape of the parabola curve.

- To reverse the parabola curve, press [Ctrl]/[Command].
- To change the position of the whole curve, press [Alt]/[Option].

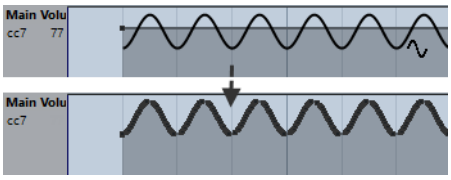
- To increase or decrease the exponent, press [Shift].

NOTE

If **Snap** is activated the **Length Quantize** value determines the density of created controller curves. For very smooth curves, use a small **Length Quantize** value or deactivate **Snap**. To avoid over-dense controller curves which can cause MIDI playback to stutter, use a medium-low density.

Sine, Triangle, and Square Mode

The **Sine**, **Triangle**, and **Square** modes create events with values that are aligned to continuous curves.



In these modes, the quantize value determines the period of the curve that is the length of one curve cycle and the **Length Quantize** value determines the density of the events. The lower the **Length Quantize** note value becomes, the smoother the curve gets.

NOTE

If **Length Quantize** is set to **Quantize Link** and you enter data in **Sine**, **Triangle** or **Square** mode, the density of the events depends on the zoom factor.

You can use modifier keys to determine the shape of the curve.

- To change the phase of the beginning of the curve, press [Ctrl]/[Command].
- To change the position of the whole curve, press [Alt]/[Option]-[Ctrl]/[Command].
- To change the maximum position of the triangle curve or the pulse of the square curve in **Triangle** and **Square** mode, press [Shift]-[Ctrl]/[Command]. This creates sawtooth curves.
- You can also set the curve period freely by holding down [Shift] when you insert events in **Sine**, **Triangle**, or **Square** mode. Activate **Snap**, [Shift]-click and drag to set the length of one period. The period length will be a multiple of the quantize value.

Paint Mode

In **Paint** mode, you can draw in multiple notes.

The quantize value determines the density of created controller curves. For very smooth curves, use a small quantize value or deactivate **Snap**. However, this creates a large number of MIDI events, which can cause MIDI playback to stutter in some situations. A medium-low density is often sufficient.

Editing Events using the Draw Tool

You can draw and edit events in the controller display with the **Draw** tool. The **Draw** tool has the same functionality as the **Line** tool in **Paint** mode.

- To change the velocity of a single note, click on its velocity bar and drag the bar up or down.

NOTE

When you move the pointer inside a controller lane, the event type value changes corresponding to the pointer movement. The event type value is displayed below the event type name, left of the controller display.

Editing Articulations (NEK only)

You can add and edit musical expressions or articulations in the controller lane.

RELATED LINKS

Expression maps (NEK only) on page 854

Editing Dynamics (NEK only)

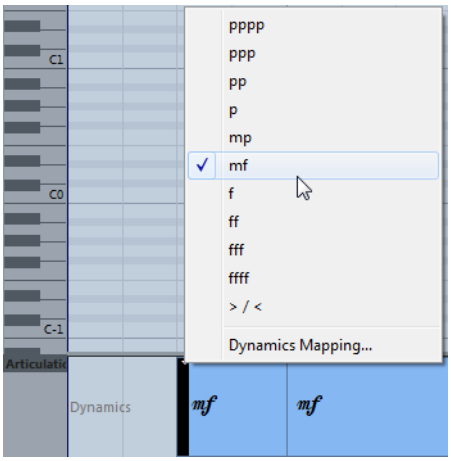
Provided that the dynamics mapping is set up and activated for the track, you can insert 12 dynamics symbols in the lower part of the **Articulations/Dynamics** lane.

- To insert a dynamics symbol, click in the controller lane with the **Draw** tool.

  A mezzo forte symbol is inserted.

- To select another dynamics symbol for an event, click on the triangle in the upper left corner of the event and select a symbol from the pop-up menu.

  If several events are selected, the same symbol is applied to all events.



- To step through the available dynamics symbols, use the mouse wheel or the **One down** and **One up** key commands.

  If several events are selected, they all change in increments, that is relative to the original values.

- To modify the settings for the dynamics symbols, open the **Controller Selection and Functions** pop-up menu and select **Dynamics Mapping Setup**.

Moving and copying dynamics events is identical to working with with other events on the controller lane.

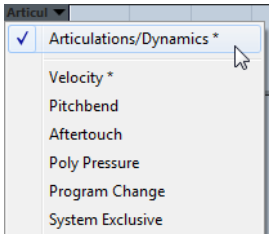
RELATED LINKS

Moving Events in the Controller Display on page 817
Working with mapped dynamics on page 1512

Using Continuous Controllers

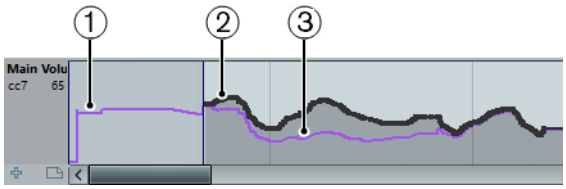
When a continuous controller is selected for a controller lane, additional data is displayed on the controller lane. This is due to the fact that MIDI controller data can be recorded or entered either for an automation track or for a MIDI part.

If automation data already exists for a controller, this is indicated by an asterisk that is displayed next to the controller name on the **Controller Selection and Functions** pop-up menu.



If the automation data is controller data that you have entered in a MIDI editor, the data is displayed on the controller lane. If the controller data was recorded on an automation track in the **Project** window, no events are displayed on the controller lane.

If conflicting controller data exists in two different places, you can specify what happens on playback by making settings for the automation merge mode. The resulting curve is displayed in addition to the curve that you entered on the controller lane.



1) The controller curve before the part starts. This curve depends on the existing controller data and on the selected merge mode.
2) Controller curve entered on the controller lane.
3) Resulting controller curve if controller automation was also recorded on a track. These values depend on the selected automation merge mode.

On the controller lane, you can also see the controller curve that is applied before the part starts. This tells you which controller value is currently being used at the starting point of the part so that you can choose the start value accordingly.

The start value also depends on the automation merge mode.

RELATED LINKS

MIDI Controller Automation on page 687
Automation Merge Modes on page 687

Poly Pressure Events

Poly Pressure events are events that belong to a specific note number (key). That is, each poly pressure event has two editable values: the note number and the amount of pressure.

When **Poly Pressure** is selected on the **Controller Selection and Functions** pop-up menu, there are two value fields to the left of the controller display, one for the note number and one for the amount.

Adding Poly Pressure Events

PROCEDURE

1. Open the **Controller Selection and Functions** pop-up menu and select **Poly Pressure**.
2. Click on the keyboard display to set the note number.

   The selected note number is displayed in the upper value field to the left of the controller display.

   NOTE

   This only works for the topmost lane. If you have selected Poly Pressure for several controller lanes, you have to type in the note number directly in the lower value field to the left of each lane.

3. Use the **Draw** tool to add a new event.

Editing Poly Pressure Events

PROCEDURE

1. Open the **Controller Selection and Functions** pop-up menu and select **Poly Pressure**.
2. Click on the arrow button next to the note number to the left of the controller lane.

   A pop-up menu appears and lists all note numbers for which there already are Poly Pressure events.

3. Select a note number from the pop-up menu.

   The Poly Pressure events for the selected note number are shown in the controller lane.

4. Use the **Draw** tool to edit the events.

   To edit events without adding new events, press [Ctrl]/[Command]+[Alt]/[Option] while drawing.

   Poly Pressure events can also be added and edited in the **List** Editor.

Controller Lane Editor

The controller lane editor allows you to perform additional scaling operations for selection ranges on existing controller curves.

In the controller lane editor, the following smart controls appear on the borders of the editor:

Editing mode	To activate this mode	Description
Move Vertically 	Click in an empty area on the upper border of the editor.	This mode allows you to move the entire curve up or down, which is useful to boost or attenuate an otherwise perfect curve.
Scale Vertically 	Click the smart control in the middle of the upper border of the editor.	Use this mode to relatively scale the curve, that is to raise or lower the values in percent.
Tilt the left/right part of the curve 	Click the smart control in the upper left/right corner of the editor.	These modes allow you to tilt the left or the right part of the curve. This is useful if the curve form is exactly the way you want it, but the start or end needs to be boosted or attenuated a bit.
Compress the left/right part of the curve 	[Alt]/[Option]-click the smart control in the upper left/right corner of the editor.	These modes allow you to compress the left or the right part of the curve.
Scale Around Absolute Center 	Click the smart control in the middle of the right border of the editor.	This mode allows you to scale the curve around the absolute center, i.e. horizontally around the center of the editor.
Scale Around Relative Center 	[Alt]/[Option]-click the smart control in the middle of the right border of the editor.	This mode allows you to scale the curve relative to its center.
Stretch 	Click and drag in the lower part of the editor (not available for velocity lanes).	This allows you to stretch the selected controller events.

Editing Selection Ranges

The controller lane editor allows you to perform additional scaling operations for selection ranges on existing controller curves.

- To open the controller lane editor, use the **Object Selection** tool to create a selection rectangle on the controller lane, encompassing the controller events that you want to edit.

  For velocity lanes, press [Alt]/[Option] to get the **Object Selection** tool.

NOTE

- The controller lane editor is not available for **Articulation** or **Dynamics** lanes.
- For velocity lanes, the editor also opens if you select multiple MIDI notes in the note display.

- To switch the controller lane editor to vertical scaling mode, press [Shift] and click on any of the smart controls.
- To move the whole selection up/down or left/right, click on a controller event inside the editor and drag the curve.
- To restrict the direction to horizontal or vertical movement, depending on the direction in which you start dragging, press [Ctrl]/[Command] when dragging.

NOTE

Snap is taken into account when moving controller curves horizontally.

Moving Events in the Controller Display

You can move events in a controller lane.

PROCEDURE

1. Select the events that you want to move with the **Object Selection** tool.

   You can also click and drag to create a selection rectangle that encompasses the events that you want to move.
2. Click on a curve point inside the selection and drag the events.

RESULT

The events inside the selection are moved to the new position. Snap is taken into account.

NOTE

If **Auto Select Controllers** is activated in the **Key Editor** toolbar, selecting notes also selects the corresponding controller events. Moving events in the note display also moves the corresponding controller events.

RELATED LINKS

Selecting Controllers within the Note Range on page 818

Deleting Events in the Controller Display

IMPORTANT

If there is more than one note at the same position, there is only one visible velocity bar. Make sure that you delete only the notes that you want to delete.

- To delete events, click on them with the **Erase** tool or select them and press [Backspace].

  You can also delete notes by deleting their velocity bars in the controller display.

  If there is more than one note at the same position, there may still only be one velocity bar visible. Make sure that you delete only the desired notes!

Selecting Controllers within the Note Range

A note range lasts until the start of the next note or the end of the part. Selected controllers for notes are moved when the corresponding notes are moved.

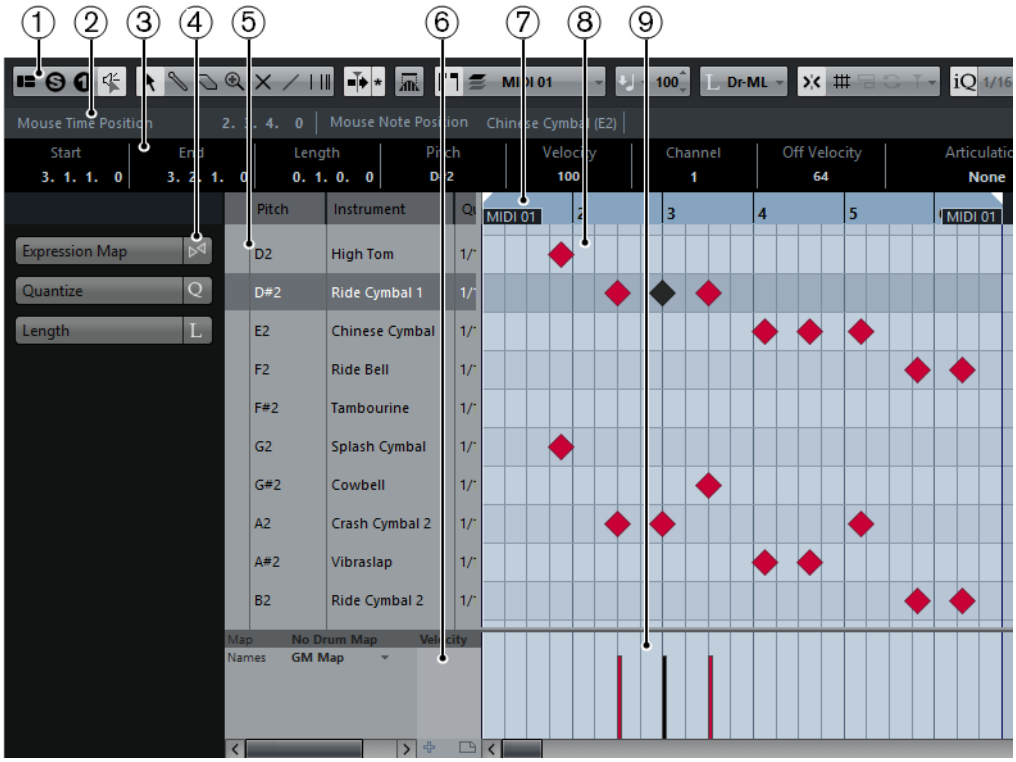
You can select the controllers within the range of the selected notes.

- To always select the corresponding controllers when you select a note event, activate **Auto Select Controllers** .
- To select the controllers within the note range, select **Edit > Select > Select Controllers in Note Range**.

  For this to work, only 2 notes have to be selected.

Drum Editor (NEK only)

The **Drum Editor** is similar to the Key Editor, but takes advantage of the fact that with drum parts, each key corresponds to a separate drum sound. This is the editor to use when you are editing drum or percussion parts.



1) **Toolbar**

Contains tools and settings.

2) **Status line**

Informs about the mouse time position, mouse note position, and current chord display.

3) **Info line**

Displays note event information about a selected MIDI note.

4) **Drum Editor Inspector**

Contains tools and functions for working with MIDI data.

5) **Drum sound list**

Lists all drum sounds.

6) **Drum map**

Lets you select the drum map for the edited track or a list of drum sound names.

7) **Ruler**

Displays the time line.

8) **Note display**

Contains a grid in which MIDI notes are displayed as boxes.

9) **Controller display**

The area below the Note display consists of one or multiple controller lanes.

Toolbar

The toolbar contains tools and various settings for the **Drum Editor**.

- To show or hide the toolbar elements, right-click the toolbar and activate or deactivate the elements.

Solo/Feedback

Set up Window Layout

Allows you to show/hide specific window sections, for example, the Status Line, the Info Line, the Inspector, etc. Which sections are available, depends on the editor.

Solo Editor

If this button is activated, you hear only the edited MIDI parts during playback.

Solo Instrument

If this button is activated, you hear only the selected MIDI part during playback.

Acoustic Feedback

If this button is activated, individual notes are automatically played back when you move or transpose them, or create them by drawing.

Tool Buttons

Object Selection

Allows you to select events.

Drumstick

Allows you to draw events.

Erase

Allows you to delete events.

Zoom

Allows you to zoom in/out. Hold [Alt]/[Option] and click to zoom out.

Mute

Allows you to mute events.

Line

Allows you to create a series of contiguous events.

Time Warp

Allows you to adjust the tempo track so that material with a musical time base can be matched to material with a linear time base.

Auto Scroll

Auto Scroll

If this button is activated, the project cursor is always visible in the window.

Independent Track Loop

Independent Track Loop

Activates/Deactivates the independent track loop for the edited part.

Auto Select Controllers

Auto Select Controllers

If this button is activated and a note is selected in the editor, the corresponding controller data is also automatically selected.

Multiple Part Controls

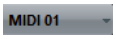
Show Part Borders

If this button is activated, the part borders are shown in the editor.

Edit Active Part Only

If this button is activated, editing operations are applied only to the active part.

Currently Edited Part



This pop-up menu lists all parts that are currently open in the editor. This allows you to select a part for editing.

Insert Velocity

Insert Velocity

Allows you to specify a velocity value for new notes.

Inserted Notes Length

Insert Length

Allows you to determine the length of an inserted note.

Nudge Palette

Trim Start Left

Increases the length of the selected element by moving its start to the left.

Trim Start Right

Decreases the length of the selected element by moving its start to the right.

Move Left

Moves the selected element to the left.

Move Right

Moves the selected element to the right.

Trim End Left

Decreases the length of the selected element by moving its end to the left.

Trim End Right

Increases the length of the selected element by moving its end to the right.

Transpose Palette

Move up

Transposes the selected event or chord up by a half note.

Move down

Transposes the selected event or chord down by a half note.

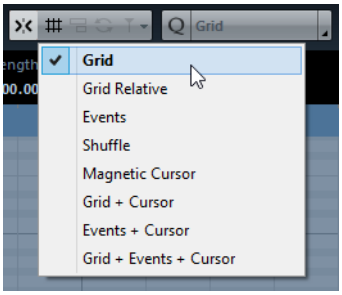
Move up more

Transposes the selected event up by an octave.

Move down more

Transposes the selected event down by an octave.

Snap/Quantize



The following options are available on the **Snap/Quantize** menu:

Snap On/Off

Activates/Deactivates the snap function.

Grid

If this option is activated, the snap positions are set with the **Grid Type** pop-up menu. The available options depend on the display format selected for the ruler.

Grid Relative

If this option is activated, events keep their relative positions to the grid when they are moved.

Events

If this option is activated, the start and end positions of other events and parts are magnetic. This means that if you drag an event to a position near the start or end of another event, it is automatically aligned with the start or end of the other event.

Shuffle

Shuffle allows you to change the order of adjacent events. If you drag the first one to the right, past the second event, the two events change places.

Magnetic Cursor

If this option is activated, the project cursor is magnetic. When you drag an event near the cursor, the event is aligned with the cursor position.

Grid + Cursor

This is a combination of **Grid** and **Magnetic Cursor**.

Events + Cursor

This is a combination of **Events** and **Magnetic Cursor**.

Grid + Events + Cursor

This is a combination of **Events**, **Grid**, and **Magnetic Cursor**.

Iterative Quantize On/Off

Activates/Deactivates iterative quantize.

Quantize Presets

Allows you to select a quantize or a groove preset.

Apply Quantize

Applies the quantize settings.

Open Quantize Panel

Opens the **Quantize Panel**.

Use Global Quantize

If this button is activated, drum notes are quantized according to the global quantize value on the toolbar. If the button is deactivated, the individual quantize values for the drum sounds are used.

Step/MIDI Input

Step Input

Activates/Deactivates the **Step Input** mode.

MIDI Input/Note Expression MIDI Input

Activates/Deactivates **MIDI Input** modes.

Move Insert Mode

Activates/Deactivates the **Move Insert** mode. For this function, **Step Input** must be activated.

Record Pitch

If **Step Input** is activated, use this button to determine that the pitch is included when you insert notes.

Record NoteOn Velocity

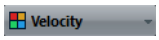
If **Step Input** is activated, use this button to determine that NoteOn Velocity is included when you insert notes.

Record NoteOff Velocity

If **Step Input** is activated, use this button to determine that NoteOff Velocity is included when you insert notes.

Event Colors

Event Colors



Allows you to select a color scheme for the events in the editor.

Hide Colors

Allows you to hide the colors.

Edit VST Instrument

Edit VST Instrument

If the track is routed to a VST instrument, use this button to open the VST Instrument panel.

Status Line

The status line is displayed below the toolbar. It displays important mouse information.

To show or hide the status line, click **Set up Window Layout** on the toolbar, and activate or deactivate **Status Line**.

Mouse Time Position

Displays the exact time position of the mouse pointer, depending on the selected ruler display format. This lets you edit or insert notes at exact positions.

Mouse Note Position

Displays the exact pitch of the mouse pointer position. This facilitates finding the right pitch when entering or transposing notes.

Independent Track Loop

A mini-cycle, affecting only the MIDI part that is being edited. If **Independent Track Loop** is activated, MIDI events within the loop range are repeated continuously.

RELATED LINKS

Setting Up the Independent Track Loop on page 569

Info Line

The info line shows values and properties of the selected events. If several notes are selected, the values for the first note are displayed in color.

To show or hide the info line, click the **Set up Window Layout** button on the toolbar, and activate or deactivate **Info Line**.

Length and position values are displayed in the selected ruler display format.

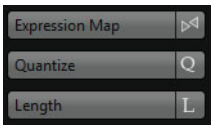
NEK only: In the Note Expression editor, the info line shows information about the selected Note Expression events.

RELATED LINKS

Editing Note Events on the Info Line on page 785
Changing the Display Format for the Ruler on page 779

Inspector

The Inspector is located to the left of the note display. The inspector contains tools and functions for working with MIDI data.



Expression Map

Allows you to load an expression map. Expression maps are useful for working with articulations.

Quantize

Allows you to access the main quantize parameters. These are identical with the functions on the **Quantize Panel**.

Length

Contains length-related options, similar to the **Functions** submenu of the **MIDI** menu.

- To change the length of the selected MIDI events or all events of the active part if no events are selected, use the **Scale Length/Legato** slider.

  At the maximum value the notes reach the beginning of the next note.

- To make the new length settings permanent, use the **Freeze MIDI Lengths** button to the right of the **Scale Length/Legato** slider.

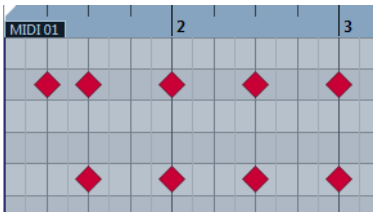
- To fine-tune the distance between consecutive notes, use the **Overlap** slider.
  At **0 Ticks**, the **Scale Legato** slider extends each note so that it reaches the next note exactly. Positive values cause the notes to overlap and negative values allow you to define a small gap between the notes.
- To use the **Legato** function or slider to extend a note until the next selected note, activate **Between Selected**.
  This is identical with activating the **Legato Mode: Between Selected Notes Only** option in the **Preferences** dialog.

RELATED LINKS

Expression maps (NEK only) on page 854
Setting up the Note Expression Inspector tab on page 870
Quantize Panel on page 265
Transpose Functions on page 301
Other MIDI functions on page 771

Note Display

The note display of the **Drum Editor** displays notes as diamond symbols.



The vertical position of the notes corresponds to the drum sound list to the left, while the horizontal position corresponds to the note's position in time.

NOTE

The diamond symbols do not indicate the length of the notes, since drum sounds most often are "one-shot" samples that disregard note lengths.

Controller Display

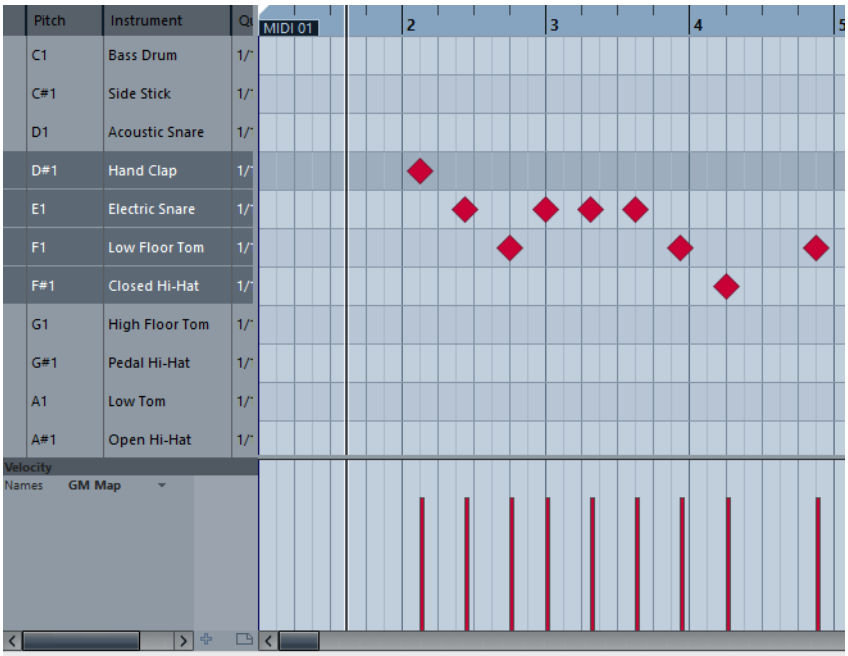
The area at the bottom of the **Drum Editor** window is the controller display.

It consists of one or several controller lanes that show one of the following properties or event types:

- Velocity values of the notes
- Pitchbend events
- Aftertouch events
- Poly Pressure events

- Program Change events
- System Exclusive events
- Articulations and Dynamics
- Any type of continuous controller event

Velocity values are shown as vertical bars in the controller display. Each velocity bar corresponds to a note in the note display. Higher bars correspond to higher velocity values.



Events other than velocity values are shown as blocks. The block corresponds to the event values. The beginning of an event is marked by a curve point.

When you select a line in the drum sound list, only the velocity controller events that belong to the note events on this line are displayed in the controller display.

If you select more than one line in the drum sound list, the controller lane shows all velocity controller events for all notes on the selected lines. This is useful when you have to adjust the controller values between different drum sounds.

NOTE

Unlike note events, controller events have no length. The value of a controller event in the display is valid until the beginning of the next controller event.

Drum Sound List

The drum sound list lists all drum sounds by name and lets you adjust and manipulate the drum sound setup in various ways.

Pitch	Instrument	Quantize	Mute	I-Note	O-Note	Chan	Output
C1	Bass Drum	1/16		C1	C1	10	Track
C#1	Side Stick	1/16		C#1	C#1	10	Track
D1	Acoustic Snare	1/16	●	D1	D1	10	Track
D#1	Hand Clap	1/16		D#1	D#1	10	Track
E1	Electric Snare	1/16	●	E1	E1	10	Track
F1	Low Floor Tom	1/16		F1	F1	10	Track
F#1	Closed Hi-Hat	1/16		F#1	F#1	10	Track
G1	High Floor Tom	1/16		G1	G1	10	Track

NOTE

The number of columns in the list depends on whether a drum map is selected for the track or not.

Pitch

Actual note number of the drum sound. This is what links notes on a MIDI track to drum sounds. For example, with the GM Map, all MIDI notes with the pitch C1 are mapped to the Bass Drum sound.

Instrument

Name of the drum sound.

Quantize

This value is used when entering and editing notes.

Mute

Mute drum sounds.

I-Note

Input note for the drum sound. When this MIDI note is sent into Nuendo, that is you play it, the note is mapped to the corresponding drum sound and automatically transposed according to the **Pitch** setting for the sound.

O-Note

Output note, that is the MIDI note number that is sent out every time the drum sound is played back.

Chan

MIDI channel, on which the drum sound is played back.

Output

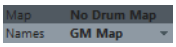
MIDI output on which, the drum sound is played back. If you set this to **Default**, the MIDI output selected for the track is used.

RELATED LINKS

Muting Notes and Drum Sounds on page 830
Drum Maps (NEK only) on page 831

Drum Map and Names Menus

Below the drum sound list are two pop-up menus that are used for selecting a drum map for the edited track or, if no drum map is selected, a list of drum sound names.



RELATED LINKS

Drum Maps (NEK only) on page 831

Drum Editor Operations (NEK only)

This section describes the principal editing operations within the **Drum Editor**.

Creating and Editing Note Events with the Drum Tool

- To create a note, select the **Drumstick** tool and click in the **Drum Editor**.

  If **Snap** is deactivated on the toolbar, the note event appears exactly where you clicked.

  If you have activated **Snap** and deactivated **Use Global Quantize** on the toolbar, the note events snap to positions according to the quantize value set for the sound in the drum sound list. You can set up different quantize values for different drum sounds.

  If **Snap** and **Use Global Quantize** are activated, the note snaps to positions according to the **Quantize** setting on the toolbar.

  The length of the inserted note is determined by the **Insert Length** setting on the toolbar. However, if this is set to **Drum-Map Link**, the note gets the length of the quantize value for the drum sound.

- To remove a note, select the **Drumstick** tool and click on an existing note.
- To audition the drum sounds, click the leftmost column of the drum sound list.

Moving and Transposing Note Events

There are several options to move and transpose note events.

- To move note events in the editor, select the **Object Selection** tool and drag them to a new position.

  All selected note events are moved, maintaining their relative positions. **Snap** is taken into account.

- To allow only horizontal and vertical movement, hold down [Ctrl]/[Command] while dragging.
- To move note events via the **Nudge Palette** buttons on the toolbar, select the note events and click a **Nudge Palette** button.

  This moves the selected note events by the amount that is set on the **Quantize** pop-up menu.

- To move note events to the project cursor position, select the note events and select **Edit > Move to > Cursor**.
- To move a note event via the info line, select a note event and edit the **Position** or **Pitch** on the info line.
- To transpose note events, select the note events and use the **Transpose Palette** buttons on the toolbar or the up and down arrow keys.

  Transpose is also affected by the global transpose setting.

- To transpose note events via the **Transpose Setup** dialog, select the note events and select **MIDI > Transpose Setup**.
- To transpose note events in steps of one octave, press [Shift] and use the up and down arrow keys.

NOTE

- When you move selected note events to a different position, any selected controllers for these note events move accordingly.
- You can also adjust the position of note events by quantizing.

RELATED LINKS

Transpose on page 764

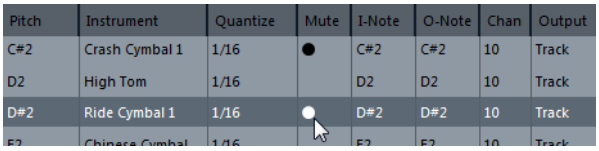
Muting Notes and Drum Sounds

IMPORTANT

The mute state for drum sounds is part of the drum map. Therefore, any other tracks using the same map are also affected.

- To mute individual notes, click or enclose them with the **Mute** tool, or select **Edit > Mute**.

- If a drum map is selected, the drum sound list has a **Mute** column. Click in the **Mute** column for a drum sound to mute that sound.



Pitch	Instrument	Quantize	Mute	I-Note	O-Note	Chan	Output
C#2	Crash Cymbal 1	1/16	●	C#2	C#2	10	Track
D2	High Tom	1/16		D2	D2	10	Track
D#2	Ride Cymbal 1	1/16	●	D#2	D#2	10	Track

- To mute all drum sounds other than the selected one, click the **Solo Instrument** button on the toolbar.

RELATED LINKS

Selecting a Drum Map for a Track on page 834

Drum Maps (NEK only)

A drum kit in a MIDI instrument is most often a set of different drum sounds with each sound placed on a separate key. For example, the different sounds are assigned to different MIDI note numbers. One key plays a bass drum sound, another a snare, and so on.

Different MIDI instruments often use different key assignments. This can be troublesome if you have made a drum pattern using one MIDI device and then want to try it on another. When you switch devices, it is very likely that your snare drum becomes a ride cymbal or your hi-hat becomes a tom, etc., because the drum sounds are distributed differently in the two instruments.

To solve this problem and to simplify several aspects of MIDI drum kits, such as using drum sounds from different instruments in the same drum kit, Nuendo features drum maps. A drum map is a list of drum sounds, with a number of settings for each sound. When you play back a MIDI track for which you have selected a drum map, the MIDI notes are filtered through the drum map before they are sent to the MIDI instrument. The map determines which MIDI note number is sent out for each drum sound and which sound is played on the receiving MIDI device.

When you want to try your drum pattern on another instrument, you simply switch to the corresponding drum map, and your snare drum sound remains a snare drum sound.

If you want to have the same drum maps included in your projects, you can load these into the template.

NOTE

Drum maps are saved with the project files. If you have created or modified a drum map, use the **Save** function to save it as a separate XML file to make it available for loading into other projects.

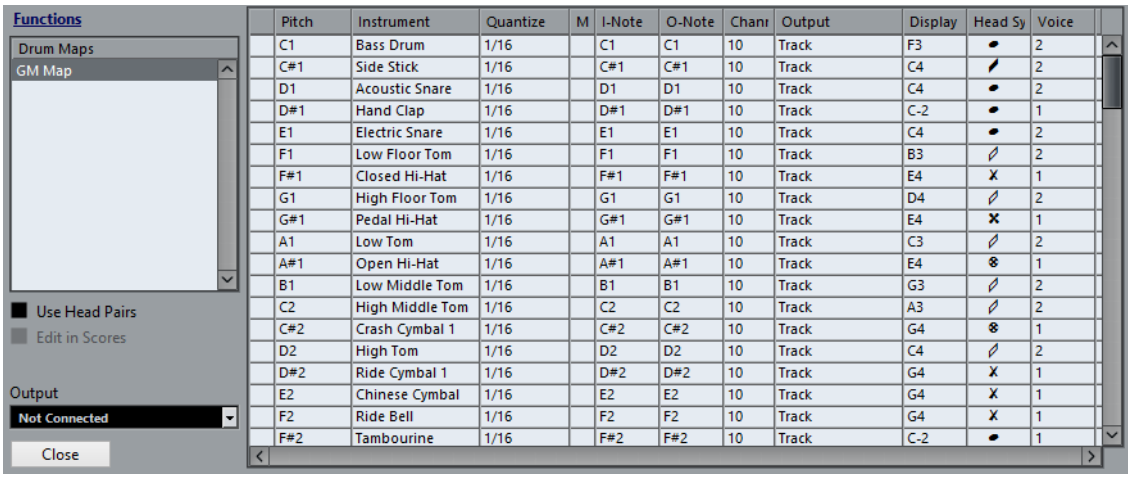
RELATED LINKS

Saving a Project Template File on page 72

Drum Map Setup Dialog

This dialog allows you to load, create, modify, and save drum maps.

To open the **Drum Map Setup** dialog, select **Drum Map Setup** from the **Map** pop-up menu or the **MIDI** menu.



The list on the left shows the currently loaded drum maps. The sounds and settings of the selected drum map are displayed on the right.

NOTE

The settings for the drum sounds are the same as in the **Drum Editor**.

Use Head Pairs

If this option is activated, two head symbols for each drum sound are displayed in the drum sound list.

Edit in Scores

If this option is activated, you can change the settings for the score drum map directly in the score.

Output

Allows you to select the output for the drum map sounds.

Drum Sound List

Lists all drum sounds and their settings. To audition a drum sound, click the leftmost column.

NOTE

If you audition a sound in the **Drum Map Setup** dialog and the sound is set to MIDI output **Default**, the output that is selected on the **Output** pop-up menu in the lower left corner is used. When auditioning a default output sound in the **Drum Editor**, the MIDI output selected for the track is used.

The **Functions** pop-up menu contains the following options:

New Map

Adds a new drum map to the project. The drum sounds are named “Sound 1, Sound 2, etc.” and have all parameters set to default values. The map is named “Empty Map”.

To rename the drum map, click the name in the list and type in a new name.

New Copy

Adds a copy of the currently selected drum map to create a new drum map. You can then change the drum sound settings of the copy and rename the drum map in the list.

Remove

Removes the selected drum map from the project.

Load

Allows you to load drum maps into your project.

Save

Allows you to save the drum map that is selected in the list on disk. Drum map files have the extension `.drm`.

Edit head pairs

Allows you to customize the note pairs.

Init Display Notes

Allows you to reset the **Display Notes** entry to the original setting, that is the Pitch entry.

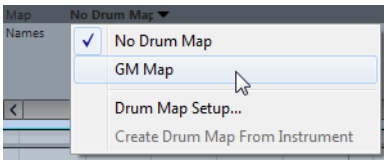
RELATED LINKS

Customizing note head pairs on page 1503
Drum Map Settings on page 833
Channel and Output Settings on page 834

Drum Map Settings

A drum map consists of settings for 128 drum sounds, one for each MIDI note number.

- To get an overview of the drum map settings, open the **Drum Editor** and use the **Map** pop-up menu below the drum sound list to select the **GM Map** drum map.



The GM map is set up according to the General MIDI standard.

You can change all drum map settings except the pitch directly in the drum sound list or in the **Drum Map Setup** dialog. These changes affect all tracks that use the drum map.

RELATED LINKS

Drum Sound List on page 828
Drum Map Setup Dialog on page 832

Channel and Output Settings

You can set separate MIDI channels and/or MIDI outputs for each sound in a drum map. When a drum map is selected for a track, the MIDI channel settings in the drum map override the MIDI channel setting for the track.

You can select different channels and/or outputs for different sounds. This allows you to construct drum kits with sounds from several different MIDI devices, etc.

- To make a drum sound use the channel of the track, set the channel in the drum map to **Any**.
- To make the sound use the MIDI output that is selected for the track, set the MIDI output for a sound in a drum map to **default**.
- To send the sound to a specific MIDI output, select any other option.
- To select the same MIDI channel or MIDI device for all sounds in a drum map, click in the **Channel** column, press [Ctrl]/[Command], and select a channel or output.
- If you make specific MIDI channel and output settings for all sounds in a drum map, you can switch between drum maps to send your drum tracks to another MIDI instrument.

Selecting a Drum Map for a Track

- To select a drum map for a MIDI track, open the **Map** pop-up menu in the Inspector or in the **Drum Editor** and select a drum map.
- To deactivate the drum map functionality in the **Drum Editor**, open the **Map** pop-up menu in the Inspector or in the **Drum Editor** and select **No Drum Map**.

  Even if you do not use a drum map, you can still separate sounds by name using a name list.

NOTE

Initially, the **Map** pop-up menu only contains **GM Map**.

RELATED LINKS

Drum Name Lists (NEK only) on page 836

About I-Notes, O-Notes and Pitches

Going through the following theory helps you make the most out of the drum map concept – especially if you want to create your own drum maps.

A drum map is a kind of filter that transforms notes according to the settings in the map. It does this transformation twice; once when it receives an incoming note that is when you play a note on your MIDI controller, and once when a note is sent from the program to the MIDI sound device.

The following example shows a modified drum map with a bass drum sound that has different pitch, I-note, and O-note values.

Pitch	Instrument	Quantize	Mute	I-Note	O-Note	Chan
C1	Bass Drum	1/16		A1	B0	10
C#1	Side Stick	1/16		C#1	C#1	10
D1	Acoustic Snare	1/16		D1	D1	10

I-Notes (Input Notes)

When you play a note on your MIDI instrument, the program looks for this note number among the I-notes in the drum map. If you play the note A1, the program finds that this is the I-note of the bass drum sound.

This is where the first transformation happens: the note gets a new note number according to the pitch setting for the drum sound. In our case, the note is transformed to a C1 note, because that is the pitch of the bass drum sound. If you record the note, it is recorded as a C1 note.

For example, you can place drum sounds near each other on the keyboard so that they can be easily played together, move sounds so that the most important sounds can be played from a short keyboard, play a sound from a black key instead of a white. If you never play your drum parts from a MIDI controller but draw them in the editor you do not need the I-note setting.

O-Notes (Output Notes)

The next step is the output. This is what happens when you play back the recorded note, or when the note you play is sent back out to a MIDI instrument in realtime (MIDI Thru):

The program checks the drum map and finds the drum sound with the pitch of the note. In our case, this is a C1 note and the drum sound is the bass drum. Before the note is sent to the MIDI output, the second transformation takes place: the note number is changed to that of the O-note for the sound. In our example, the note sent to the MIDI instrument is a B0 note.

The O-note settings let you set things up so that the bass drum sound really plays a bass drum. If you are using a MIDI instrument in which the bass drum sound is on the C2 key, you set the O-note for the bass drum sound to C2. When you switch to another instrument (in which the bass drum is on C1) you want the bass drum O-note set to C1. Once you have set up drum maps for all your MIDI instruments, you can select another drum map when you want to use another MIDI instrument for drum sounds.

Setting Pitches of Notes According to their O-Note Settings

You can set the pitch of notes according to their O-note settings. This is useful if you want to convert a track to a regular MIDI track with no drum map and still have the notes play back the correct drum sound.

It's a typical use case to export your MIDI recording as a standard MIDI file. If you first perform an O-note conversion, you make sure that your drum tracks play back as intended when they are exported.

- To perform an O-note conversion, select **MIDI > O-Note Conversion**.

RELATED LINKS

Exporting and importing standard MIDI files on page 1202

Drum Name Lists (NEK only)

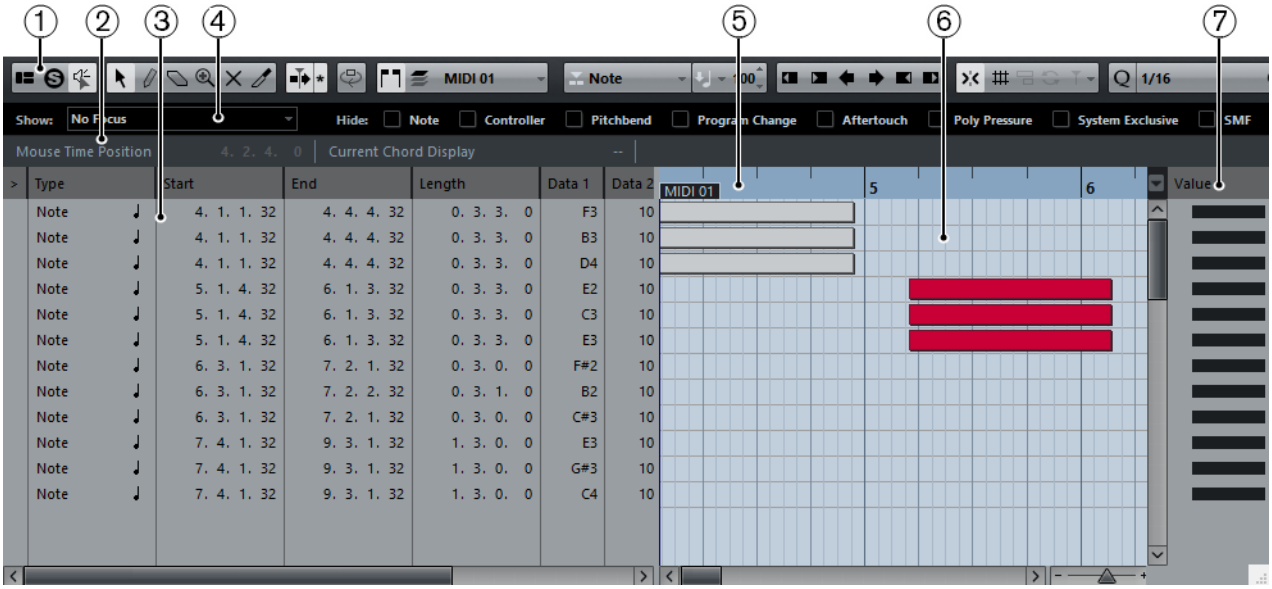
Drum name lists allow you to use the **Drum Editor** even if no drum map is selected for the edited MIDI track. The drum sound list then consists of the columns **Audition**, **Pitch**, **Instrument (drum sound name)**, and **Quantize**.

This means that you can use the drum sound names in any loaded drum map without using I-notes and O-notes.

In the drum name list mode, the names that are shown in the **Instrument** column depend on the selection on the **Names** pop-up menu at the bottom of the **Drum Editor**. The pop-up menu contains the currently loaded drum maps and **GM Map**.

List Editor

The **List Editor** shows all events in the selected MIDI parts as a list, allowing you to view and edit their properties numerically. It also allows you to edit SysEx messages.



1) Toolbar
2) Status line
3) Event list
4) Filters bar
5) Ruler
6) Event display
7) Value display

Toolbar

The toolbar contains tools and various settings for the **List Editor**.

- To show or hide the toolbar elements, right-click the toolbar and activate or deactivate the elements.

Tool Buttons

Object Selection

Allows you to select events.

Draw

Allows you to draw events.

Erase

Allows you to delete events.

Zoom

Allows you to zoom in/out. Hold [Alt]/[Option] and click to zoom out.

Mute

Allows you to mute events.

Trim

Allows you to resize selected events by moving their start or end positions in steps according to the **Length Quantize** value.

Auto Scroll

Auto Scroll

If this button is activated, the project cursor is always visible in the window.

Independent Track Loop

Independent Track Loop

Activates/Deactivates the independent track loop for the edited part.

Multiple Part Controls

Show Part Borders

If this button is activated, the part borders are shown in the editor.

Edit Active Part Only

If this button is activated, editing operations are applied only to the active part.

Currently Edited Part

MIDI 01

This pop-up menu lists all parts that are currently open in the editor. This allows you to select a part for editing.

Insert Type

Insert Event Type

Note

Is used when creating new events. This is where you determine what type of event to add.

Insert Velocity

Insert Velocity

100

Allows you to specify a velocity value for new notes.

Nudge Palette

Trim Start Left

Increases the length of the selected element by moving its start to the left.

Trim Start Right

Decreases the length of the selected element by moving its start to the right.

Move Left

Moves the selected element to the left.

Move Right

Moves the selected element to the right.

Trim End Left

Decreases the length of the selected element by moving its end to the left.

Trim End Right

Increases the length of the selected element by moving its end to the right.

Snap/Quantize

Snap On/Off

Activates/Deactivates the snap function.

Grid

If this option is activated, the snap positions are set with the **Grid Type** pop-up menu. The available options depend on the display format selected for the ruler.

Grid Relative

If this option is activated, events keep their relative positions to the grid when they are moved.

Events

If this option is activated, the start and end positions of other events and parts are magnetic. This means that if you drag an event to a position near the start or end of another event, it is automatically aligned with the start or end of the other event.

Shuffle

Shuffle allows you to change the order of adjacent events. If you drag the first one to the right, past the second event, the two events change places.

Magnetic Cursor

If this option is activated, the project cursor is magnetic. When you drag an event near the cursor, the event is aligned with the cursor position.

Grid + Cursor

This is a combination of **Grid** and **Magnetic Cursor**.

Events + Cursor

This is a combination of **Events** and **Magnetic Cursor**.

Grid + Events + Cursor

This is a combination of **Events**, **Grid**, and **Magnetic Cursor**.

Iterative Quantize On/Off

Activates/Deactivates iterative quantize.

Quantize Presets

Allows you to select a quantize or a groove preset.

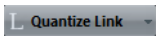
Apply Quantize

Applies the quantize settings.

Open Quantize Panel

Opens the **Quantize Panel**.

Length Quantize



Determines the event length for the **Length Quantize** function.

Step/MIDI Input

Step Input

Activates/Deactivates the **Step Input** mode.

MIDI Input/Note Expression MIDI Input

Activates/Deactivates **MIDI Input** modes.

Move Insert Mode

Activates/Deactivates the **Move Insert** mode. For this function, **Step Input** must be activated.

Record Pitch

If **Step Input** is activated, use this button to determine that the pitch is included when you insert notes.

Record NoteOn Velocity

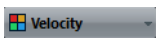
If **Step Input** is activated, use this button to determine that NoteOn Velocity is included when you insert notes.

Record NoteOff Velocity

If **Step Input** is activated, use this button to determine that NoteOff Velocity is included when you insert notes.

Event Colors

Event Colors



Allows you to select a color scheme for the events in the editor.

Hide Colors

Allows you to hide the colors.

Edit VST Instrument

Edit VST Instrument

If the track is routed to a VST instrument, use this button to open the VST Instrument panel.

RELATED LINKS

Using the Setup options on page 1226

Status Line

The status line is displayed below the toolbar. It displays important information about the mouse position.

To show or hide the info line, click **Set up Window Layout** on the toolbar, and activate or deactivate **Status Line**.

Mouse Time Position

Displays the exact time position of the mouse pointer, depending on the selected ruler display format. This lets you edit or insert notes at exact positions.

Current Chord Display

When the project cursor is positioned over notes that form a chord, this chord is displayed here.

Independent Track Loop

A mini-cycle, affecting only the MIDI part that is being edited. If **Independent Track Loop** is activated, MIDI events within the loop range are repeated continuously.

Filters Bar

The filters bar allows you to hide events from view, based on their type and other properties.

To show or hide the filter bar, click the **Set up Window Layout** button on the toolbar, and activate or deactivate **Filters**.

Show Section

The **Show** section allows you to set up filters.

No Focus

No filter is applied.

Event Types

Only events of the same event type as the selected type will be shown. This is the same as activating event types in the **Hide** section.

Event Types and Data 1

Only events of the same event type as the selected type and with the same **Data 1** value are shown. For example, if a note event is selected, only notes with the same pitch are shown. If a controller event is selected, only controllers of the same type are shown.

Event Channels

Only events with the same MIDI channel value as the selected event are shown.

Setup

Opens the **Logical Editor**. Here you can create complex filter settings.

When you apply any of the **Logical Editor** presets or use the **Logical Editor** to create filter settings yourself, only the events that meet the specified criteria are visible.

Hide Section

The **Hide** section allows you to hide specific event types from view.

RELATED LINKS

Filtering the Event List on page 845
The Logical Editor, Transformer, and Input Transformer on page 935

Event List

The **Event List** lists all events in the selected MIDI parts, in the order in which they are played back from top to bottom. The list allows you to perform detailed numerical editing of the event properties.

The following options are available:

>

An arrow in this column indicates the event that starts closest before the project cursor position. You can use this column for auditioning when you are editing in the list.

- To move the cursor to the start of the event, click in the auditioning column of an event.
- To move the cursor position and start/stop playback, double-click in the column for an event.

Type

Event type. Cannot be changed.

Start

Starting position of the event, displayed in the format selected for the ruler. Changing it has the same effect as moving the event.

NOTE

If you move the event past any other event in the list, the list is resorted. The list always shows the events in the order in which they are played back.

End

Allows you to view and edit the end position of a note event. Editing resites the note event.

Length

Displays the length of the note event. Changing this resizes the note event and automatically changes the **End** value.

Data 1

Data 1 or **Value 1** property of the event. Its content depends on the event type. For notes, this is the pitch, for example. Where applicable, the values are displayed in the most relevant form. For example, the **Data 1** value for notes is displayed as a note number in the format that was selected in the **Preferences** dialog.

Data 2

Data 2 or **Value 2** property of the event. The content of this depend on the event type. For notes, this is the note-on velocity value, for example.

Data 3

The **Data 3** or **Value 3** property of the event. This value is only used for note events, where it corresponds with the note-off velocity.

Channel

MIDI channel of the event. This setting is normally overridden by the channel setting for the track. To make a MIDI event play back on its own channel, set its track to the Any channel in the **Project** window.

Comment

Allows you to add comments to some event types.

Event Display

The **Event Display** displays events graphically. The vertical position of an event in the display corresponds to its entry in the list, that is to the playback order, while the horizontal position corresponds to its actual position in the project. In the event display, you can add new parts or events, drag events to another position.

Value Display

The value display to the right of the event display is a tool for quick viewing and editing of multiple values, for example, velocities or controller amounts. The values are shown as horizontal bars, with the bar length corresponding to the value.

To show or hide the value display, click **Set up Window Layout** on the toolbar, and activate or deactivate **Value Display**.

The value that is displayed for an event depends on the event type. The following table shows what is displayed and edited in the **Data** columns and the value display:

Event type	Data 1	Data 2	Value display
Note	Pitch (note number)	Note-on velocity	Velocity
Controller	Controller type	Controller amount	Controller amount
Program Change	Program number	Not used	Program number
Aftertouch	Aftertouch amount	Not used	Aftertouch amount
Pitchbend	Bend amount	Not used	Bend amount
SysEx	Not used	Not used	Not used

NOTE

For note events, there is also a value in the **Data 3** column, which is used for note-off velocity.

NOTE

For SMF and text events, no values are displayed.

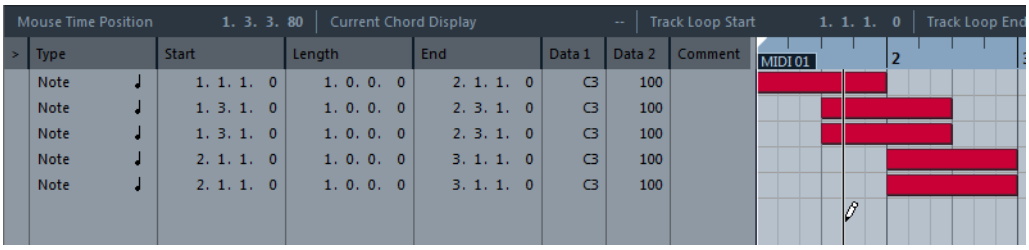
List Editor Operations

This section describes the principal editing operations within the **List Editor**.

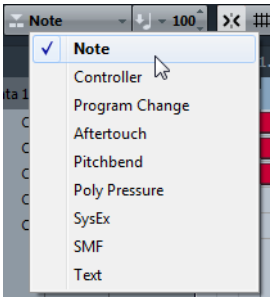
Drawing Events

The **Draw** tool allows you to insert single events in the event display.

When you move the cursor inside the event display, its position is indicated on the status line. The snap function is taken into account.



- To change the event type that you want to draw, select it from the **Insert Event Type** pop-up menu.



- To draw an event, click in the event display.

  The note event gets the length that is set on the **Length Quantize** pop-up menu. Notes get the insert velocity value set in the **Insert Velocity** field on the toolbar.

- To draw longer note events, click and drag in the event display.

  The length of the event is a multiple of the **Length Quantize** value. If **Length Quantize** is set to **Quantize Link**, the event value is determined by the quantize grid.

Filtering the Event List

You can filter the event list with the **Filters** bar that is displayed below the toolbar in the **List Editor**.

- To filter the event list based on complex criteria, open the **Show** pop-up menu and select a filter.
- To hide an event type, activate the corresponding checkbox on the **Filters** bar.
- To hide all event types except one, press [Ctrl]/[Command] and click the checkbox of the event type that you want to view.

  If you [Ctrl]/[Command]-click again, all checkboxes are cleared.

Editing in the Event List

- To edit the values of several events, select the events and edit the value for one event.

  The values of the other selected events are also changed. Any initial value differences between the events are maintained.

- To set the values of all selected events to the same value, press [Ctrl]/[Command] and edit the value for one event.

- For SysEx events, you can only edit the **Start** position in the list. However, when you click the **Comment** column, the **MIDI SysEx Editor** opens, in which you can perform detailed editing of system exclusive events.

NOTE

When you trim the beginning of a note in the **List Editor**, the note may move to a different position in the list, since other events may begin earlier than the edited event.

RELATED LINKS

SysEx Messages on page 849

Editing in the Event Display

The event display allows you to edit the events graphically using the tools on the toolbar. You can edit single events as well as several selected events simultaneously.

- To move an event, drag it to a new position.

  Moving the event past any other event in the display resorts the list. The list always shows the events in the order in which they are played back. As a result, the vertical position of the event in the display also changes.

- To make a copy of an event, press [Alt]/[Option] and drag it to a new position.

- To resize a note, select it and drag its end point with the **Object Selection** tool.

- To mute or unmute an event, click on it with the **Mute** tool.

  You can mute or unmute several events simultaneously by enclosing them in a selection rectangle with the **Mute** tool.

- You can select a color scheme for the events with the **Event Colors** pop-up menu on the toolbar.

- To delete an event, select it and press [Backspace] or [Delete], or click on it with the **Erase** tool.

RELATED LINKS

Coloring Notes and Events on page 781

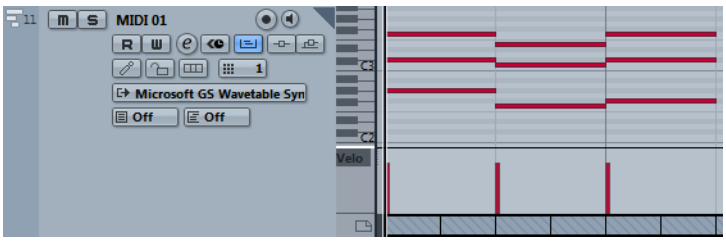
Editing in the Value Display

- To edit values in the value display, click and drag.

  The mouse pointer automatically takes on the shape of the **Draw** tool when you move it over the value display.

In-Place Editor

The **In-Place Editor** allows you to edit MIDI notes and controllers directly in the **Project** window, for quick and efficient editing in context with other tracks.



The **In-Place Editor** expands the MIDI track to show a miniature **Key Editor**. When you select a MIDI note, the **Project** window info line shows the same information about the note, as the info line in the **Key Editor**. You can perform the same editing here as in the **Key Editor**.

RELATED LINKS

Editing Note Events on the Info Line on page 785

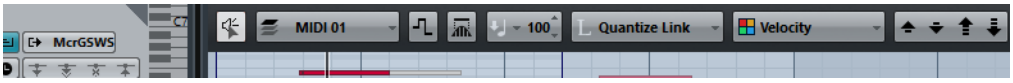
Opening the In-Place Editor

- To open the **In-Place Editor** for the selected tracks, select **MIDI > Open In-Place Editor**.
- To open the **In-Place Editor** for a single MIDI track, click the corresponding **Edit In-Place** button in the track list.

Toolbar

The toolbar contains tools and settings for the **In-Place Editor**.

To open the toolbar, click on the gray triangle in the upper right corner of the track list for the edited track.



Static Buttons

Acoustic Feedback

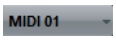
If this button is activated, individual notes are automatically played back when you move or transpose them, or when you create them by drawing.

Multiple Part Controls

Edit Active Part Only

If this button is activated, editing operations are applied only to the active part.

Currently Edited Part



This pop-up menu lists all parts that are currently open in the editor. This allows you to select a part for editing.

Insert Velocity

Insert Velocity

Allows you to specify a velocity value for new notes.

Indicate Transpositions

Indicate Transpositions

If this button is activated, MIDI notes are displayed according to their transposition settings.

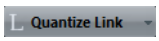
Auto Select Controllers

Auto Select Controllers

If this button is activated and a note is selected in the editor, the corresponding controller data is also automatically selected.

Snap/ Quantize

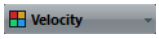
Length Quantize



Determines the event length for the **Length Quantize** function.

Event Colors

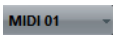
Event Colors



Allows you to select a color scheme for the events in the editor.

List of Parts in Editor

List of Parts in Editor



Lists all parts of the selected In-Place Editor.

Transpose Palette

Move up

Transposes the selected event or chord up by a half note.

Move down

Transposes the selected event or chord down by a half note.

Move up more

Transposes the selected event up by an octave.

Move down more

Transposes the selected event down by an octave.

Working with the In-Place Editor

- To zoom or scroll the **In-Place Editor**, point at the left part of the piano keyboard display so that the pointer changes to a hand. Then drag to the right or left to zoom in or out vertically, and drag up or down to scroll the editor.
- To add or remove controller lanes, right-click below the controller name field and select an option from the context menu.
- To close the **In-Place Editor** for one track, click **Edit In-Place** in the track list or double-click below the controller display in the **In-Place Editor**.
- To open/close the **In-Place Editor** for one or several selected tracks, use the **Edit In-Place** key command.
- You can drag notes from one **In-Place Editor** to another.

NOTE

The **Snap** button and **Snap Type** pop-up menu on the **Project** window toolbar control snapping in the **In-Place Editor**, but the snap grid is set using the **Quantize** pop-up menu.

SysEx Messages

SysEx (System Exclusive) messages are model-specific messages for setting various parameters of a MIDI device. This makes it possible to address device parameters that would not be available via normal MIDI syntax.

Every major MIDI manufacturer has its own SysEx identity code. SysEx messages are typically used for transmitting patch data, for example, the numbers that make up the settings of one or more sounds in a MIDI instrument.

Nuendo allows you to record and manipulate SysEx data in various ways.

RELATED LINKS

Using MIDI devices on page 751

Bulk Dumps

In any programmable device, the settings are saved as numbers in computer memory. If you change these numbers, you will change the settings. Normally, MIDI devices allow you to dump (transmit) all or some settings in the device's memory in the form of MIDI SysEx messages.

A dump is therefore, among other things, a way of making backup copies of the settings of your instrument: sending such a dump back to the MIDI device restores the settings.

If your instrument allows the dumping of a few or all of its settings via MIDI by activating some function on the front panel, this dump will probably be recordable in Nuendo.

Recording a Bulk Dump

IMPORTANT

If your MIDI instrument does not offer a way to initiate a dump, you have to send a Dump Request message from Nuendo to start the dump. In that case, use the **MIDI SysEx Editor** to insert the specific Dump Request message (see the instrument's documentation) at the beginning of a MIDI track. When you activate recording, the Dump Request message is played back (sent to the instrument), the dump starts and is recorded.

PROCEDURE

1. Do one of the following:
   - On Microsoft Windows, select **File > Preferences**.
   - On Mac, select the Nuendo menu, and select **Preferences**.
2. In the **Preferences** dialog, select **MIDI > MIDI Filter**.
3. In the **Record** section, deactivate the **SysEx** checkbox to make sure that the recording of SysEx data is not filtered.

   This way, SysEx messages are recorded but not echoed back to the instrument. This can lead to unpredictable results.
4. Activate recording on a MIDI track and initiate the dump from the front panel of the instrument.
5. When you have finished recording, select the new part and select **MIDI > List Editor**.

   This allows you to check that the SysEx dump was recorded. There should be one or several SysEx events in the part/event list.

Transmitting a Bulk Dump Back to a Device

PREREQUISITE

Route the MIDI track with the System Exclusive data to the device. Check your device's documentation to find details about which MIDI channel should be used, etc.

PROCEDURE

1. Solo the track.
2. Make sure that the device is set up to receive SysEx messages.
3. If necessary, put the device in **Standby to Receive System Exclusive** mode.
4. Play back the data.

About Recording and Transmitting Bulk Dumps

- Do not transmit more data than you need. If all you want is a single program, do not send all. Otherwise, it could get too difficult to find the recognized program. Usually, you can specify exactly which data you want to send.
- If you want the sequencer to dump the pertinent sounds to your instrument whenever you load a project, put the SysEx data in a silent count-in before the project itself starts.
- If the dump is very short, which can, for example, be a single sound you can put the dump in the middle of the project to quickly re-program a device. However, you can achieve the same effect by using Program Change. This is definitely preferable, since less MIDI data is sent and recorded. Some devices may be set up to dump the settings for a sound as soon as you select it on the front panel.
- If you create parts with useful SysEx dumps, you can put these on a special muted track. To make use of these parts, drag it to an empty unmuted track and play it back.
- Do not transmit several SysEx dumps to several instruments at the same time.
- Make a note of the current device ID setting of the instrument. If you change this, the instrument may later refuse to load the dump.

Recording SysEx Parameter Changes

Often you can use SysEx to remotely change individual settings in a device, for example, opening a filter, selecting a waveform, changing the decay of the reverb, etc. Many devices are also capable of transmitting changes that are made on the front panel as SysEx messages. These can be recorded in Nuendo, and thus incorporated into a regular MIDI recording.

For example: you open up a filter while playing some notes. In that case, you record both the notes and the SysEx messages that are generated when you open the filter. When you play back the recording, the sound changes exactly as it did when you recorded it.

PROCEDURE

1. Select **File > Preferences**.
2. In the **Preferences** dialog, select **MIDI > MIDI Filter** and make sure that **SysEx** is deactivated in the **Record** section.
3. Make sure that the instrument is set to transmit changes of front panel controls as SysEx messages.
4. Record.

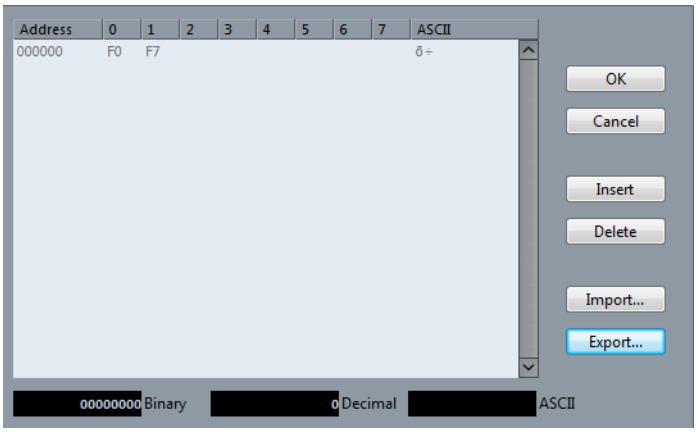
AFTER COMPLETING THIS TASK

In the **List Editor**, check if the events were recorded properly.

MIDI SysEx Editor

While SysEx events are displayed in the **List Editor/Project Browser**, it is not their entire content, that is displayed. Only the beginning of the message is displayed in the **Comment** column for the event. The event is not editable. You can only move the event, the same way you would move it in the **List Editor**.

- To open the **MIDI SysEx Editor** for a SysEx event, click in the **Comments** column for the event in the **List Editor/Project Browser**.



The display shows the entire message on one or several lines. SysEx messages always begin with F0 and end with F7 and a number of arbitrary bytes in between. If the message contains more bytes, so that they do not entirely fit on one line, it continues on the next line. The Address indication to the left helps you find out on which position in the message a certain value is located.

You can edit all values except for the first (F0) and the last ones (F7).

In the **MIDI SysEx Editor**, the bytes are displayed as follows:

- In the main display, values are shown in hexadecimal format.

- To the right of the main display, values are shown in ASCII format.
- At the bottom of the dialog, the selected value is shown in ASCII, binary, and decimal formats.

Adding and Deleting Bytes

- To add a byte, open the **MIDI SysEx Editor** and click **Insert**. The byte is added before the selected byte.
- To delete a byte, open the **MIDI SysEx Editor**, select a byte, and click **Delete**.
- To delete the complete SysEx message, select it in the List Editor and press [Delete] or [Backspace].

Editing Byte Values

You can edit the selected byte value in the main display of the **MIDI SysEx Editor**, or in the ASCII, decimal, and binary displays.

- To edit the selected value, open the **MIDI SysEx Editor**, click on a byte, and type in the value.

Importing and Exporting SysEx Data

You can import SysEx data from disk and export the edited data to a file.

The file has to be in MIDI SysEx (.syx) binary format. Only the first dump in a SYX file will be loaded.

- To import SysEx data, open the **MIDI SysEx Editor** and click **Import**.
- To export SysEx data, open the **MIDI SysEx Editor** and click **Export**.

NOTE

Do not confuse this format with MIDI files, which have the extension .mid.

Expression maps (NEK only)

Introduction

About articulations

Musical articulations, or expressions, define how certain notes “sound”, i.e. how they are sung or performed on a given instrument. They allow you to specify that a string instrument is bowed (not plucked), a trumpet muted (not played open), and so on. Articulations also define the relative volume of notes (to play some notes louder or softer than the others) or changes in pitch (create a tremolo).

Articulations can be divided into “Directions” and “Attributes”.

- Directions are valid for all notes from the insert position on, until another direction is scored. This means, they are applied not to single notes, but to a continuous range of notes, or even an entire piece of music.

  An example for a direction is pizzicato, which means that the string instrument is plucked.

- Attributes belong to single notes. They are only applied to the notes for which they are scored.

  Examples for this are accents, where a note is played with an emphasis, and staccato, where a note is played shorter.

Direction	Attribute	Attribute	Attribute
Pizzicato	Tenuto	Accent	Staccato
			

Articulations and MIDI

When working with MIDI, i.e. when you are entering notes via a MIDI keyboard, editing notes in the MIDI editors or using VST instruments, articulations need to be realized as different sounds.

To trigger the necessary sound changes, use the following command and data types:

Program Change

Program Change messages can be used to instruct a connected VST instrument to switch from one program to another. Depending on the instrument, this can be used to play a different articulation.

MIDI channel

Multi-timbral instruments, such as Steinberg's HALion, feature programs, usually representing different articulations. These can be accessed via MIDI channel messages.

Key switches

Some software samplers, like Steinberg's HALion Symphonic Orchestra, make use of "key switches", meaning that certain keys are not used to trigger sounds, but to switch between articulations, for example.

Expression maps

When working on a project, you might want to audition a composition including articulations. In Nuendo, this can be achieved using expression maps, which can be selected via the Expression Map section in the Inspector for MIDI or instrument tracks. Within these maps, you can specify the sound mapping and characteristics for all your musical expressions, using the methods described in the table above.

When you select an expression map for a MIDI or instrument track, the articulations (sounds) defined in the map are automatically applied during playback. Nuendo recognizes the expressions scored for the MIDI part and searches the sound slots in the expression map for a sound that matches the defined criteria.

When a matching sound slot is found, the current note is either modified (e.g. reduced in length or played louder), or the MIDI channel, program change or key switch information is sent to the connected instrument (the instrument selected on the Output Routing pop-up menu for the track), so that a different sound is played. When no sound slot is found that matches the articulations used in the part, the "closest match" is used.

When you enter articulations in a MIDI part, you need to set up an expression map in a way that the right sounds in the connected VST or MIDI instrument are triggered.

Expression maps also allow you to link your articulations with remote keys on a MIDI input device and map these to sounds that can be played by a MIDI device or VST instrument. This way, you can enter notes and articulations using a remote MIDI device and have these automatically be recorded and played back correctly by Nuendo.

Expression maps are useful in the following situations:

- When you want to enter musical articulations directly in one of the MIDI editors, especially the Score Editor, without having to record MIDI data first.

- When you want to play/record music in realtime and control articulation changes while playing.
- When you open and edit projects from other users. By using expression maps, you can map the articulation information to a different instrument set or content library quickly and easily.

NOTE

You can also use the Note Expression functions to add articulations directly on your MIDI notes in the Key Editor.

RELATED LINKS

Creating and editing expression maps on page 861
Groups on page 865
Note Expression (NEK only) on page 868

Using expression maps

Expression maps and their related functions can be found in different locations in Nuendo. To be able to use these functions, an expression map or a track preset containing such a map has to be loaded.

Loading expression maps

Expression maps can either be part of track or VST presets, or be saved separately. Depending on this, the way to make them available in Nuendo is slightly different.

Loading expression maps that are part of presets

Nuendo comes with a set of predefined expression maps which are part of the default presets. They are loaded automatically with the presets.

The following applies:

- Included with Nuendo are several track presets which are pre-configured for use with expression maps. They contain sounds that make use of key switches and have different articulations. To indicate that these presets can be used in this context, they have the suffix “VX”.
- Track presets for HALion Symphonic Orchestra can also be used with expression maps. The presets are installed automatically with Nuendo. However, for them to be available, you have to separately install the VST instrument.

  These track presets begin with “HSO” and end with “VX”.

RELATED LINKS

Track Presets on page 167

Expression maps that were saved separately

You can also define your own expression maps. To load these, proceed as follows:

PROCEDURE

1. In the Inspector for the selected track, select the Expression Map section, open the pop-up menu and select “Expression Map Setup…”.

   The Expression Map Setup window opens.

   NOTE

   If the Expression Map section is not shown in the Inspector, right-click on another Inspector section and select “Expression Map” from the context menu.

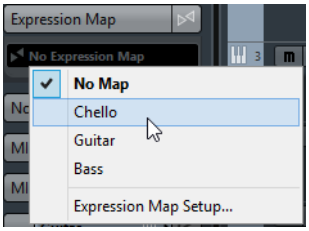
2. In the Expression Maps section on the left, click the Load button.

   A file dialog appears.

3. Locate and select an expression map and click Open.

   The expression map is added to the Maps list.

4. Repeat the steps for all the maps that you want to make available, and close the dialog.



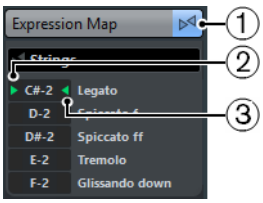
All loaded maps are available on the Expression Map pop-up menu in the Inspector.

RELATED LINKS

Creating and editing expression maps on page 861

Expression maps in the Project window

In the Inspector for MIDI and instrument tracks, the Expression Map section is available. This indicates whether an expression map is used for a track. It also shows the sound slots that are active for playback and for realtime input.

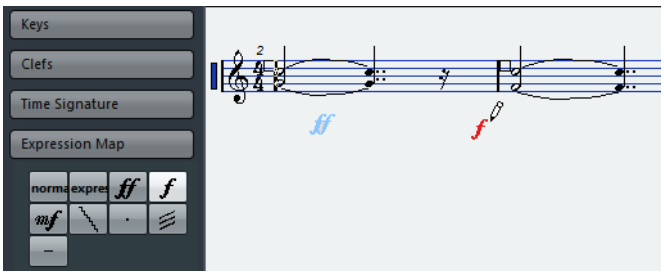


1) Indicates that an expression map is used for the track.
2) Shows which remote key is being pressed.
3) Marks the slot that is currently played back.

The possibility to monitor the active slots is especially useful when recording articulations with an external device, such as a MIDI keyboard. This way, you can see whether the correct sound slot, i.e. the right articulation, is used.

Expression maps in the Score Editor

In the Score Editor, the articulations that are part of an expression map can be inserted like other symbols. There is a special tab in the Symbols Inspector, containing all articulation symbols of the current expression map.



- To insert a symbol, click on it in the Expression Map tab, and click at the desired position in the note display.
- To delete an articulation symbol from the score, select it and press [Delete] or [Backspace].

  You can also click on it with the Eraser tool.

NOTE

In the Preferences dialog (Score–Colors for Additional Meanings page), you can specify a color for Expression Map symbols. This way, you can easily distinguish them from other Score symbols.

Articulation editing in the Score Editor is the same as regular symbol editing.

IMPORTANT

In the Score Editor, it is possible to insert symbols for a single note that in fact cannot be combined in a musically meaningful way. So when entering articulations, make sure that they do not conflict with other articulations.

RELATED LINKS

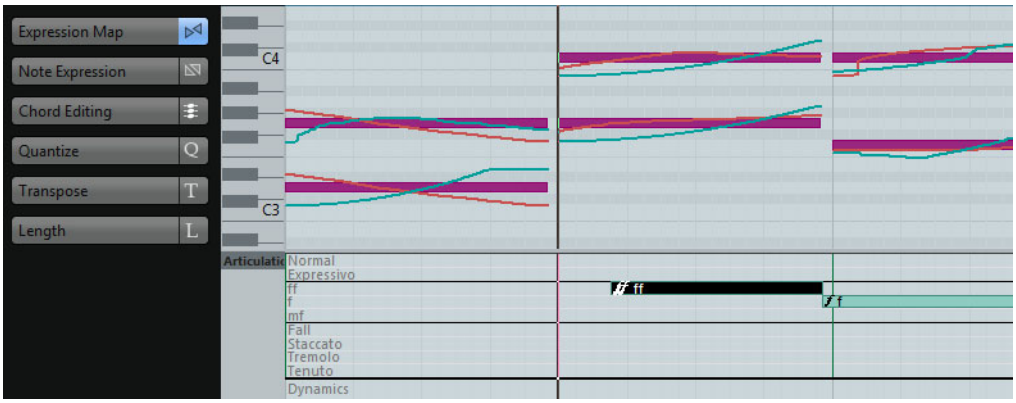
Working with symbols on page 1402

Expression maps in the Key, Drum, and In-Place Editors

If an expression map is used for a MIDI or instrument track, its articulations are shown in the note events in the Key Editor display, provided that the vertical zoom factor is high enough. If the horizontal zoom factor is high enough, the attribute description (the text in the Description column) is also shown.

You can insert and edit articulations in the Key, Drum, and In-Place Editors using the controller lane. This is much like regular controller lane editing.

- To display the articulations set up in the selected expression map, open the pop-up menu to the left of the lane and select “Articulations/Dynamics”.



- When “Articulations/Dynamics” is selected for a controller lane, the note beginnings are displayed as thin vertical lines in the controller display.

- All articulations that are specified for the selected expression map are available on the controller lane. They appear on different rows one above the other. The order in which they are listed is the same as in the expression map.

  The different groups (1 to 4) are also reflected here. They are separated by black lines. Articulations belonging to the same group are shown in the same color.

- Directions are displayed as bars in the controller lane. They begin at the insertion point of a direction and end at the insertion point of the next articulation from the same group (or at the end of the part if no more directions follow). Attributes are inserted at the note beginning.

  You can assign a maximum of one attribute per group to each note.

RELATED LINKS

Editing Articulations on page 864
Using the Controller Display on page 807
Editing Dynamics (NEK only) on page 813
Groups on page 865

Editing on the controller lane

- To insert new directions on the controller lane, select the Draw tool and click at the desired position in the respective row, i.e. where you want the direction to start. Note that you have to click at the exact position of the first note that you want to apply this articulation to or to the left of it.

  Instead of selecting the Draw tool, you can also hold down [Alt]/[Option] and click at the desired position.

- To insert new attributes on the controller lane, select the Draw tool and click at the respective note line in the corresponding row of the controller lane.

Instead of selecting the Draw tool, you can also hold down a modifier key (by default [Alt]/[Option]) and click at the desired position.

- To remove a direction, click on it with the Erase tool or select it and press [Delete] or [Backspace].
- To remove an attribute, click on it with the Draw tool.

  Note that you cannot select attributes in the controller lane without automatically selecting the corresponding note, too. Therefore, you cannot delete an attribute by selecting it and pressing [Delete] or [Backspace] without deleting the note as well.

NOTE

If several notes are selected, you can use the Draw tool to insert or delete attributes for all of them in one go.

Editing on the info line

When a MIDI note is selected in the note display, the info line contains the “Articulations” option. This displays the note attributes (symbols) specified for the selected note. Click in this section to open the Articulations pop-up menu.

The following applies:

- All note attributes available in the expression map are shown on the pop-up menu, sorted by group.
- To add an attribute to a note, simply select it on the pop-up menu. Attributes that are active for a note are indicated on the menu.

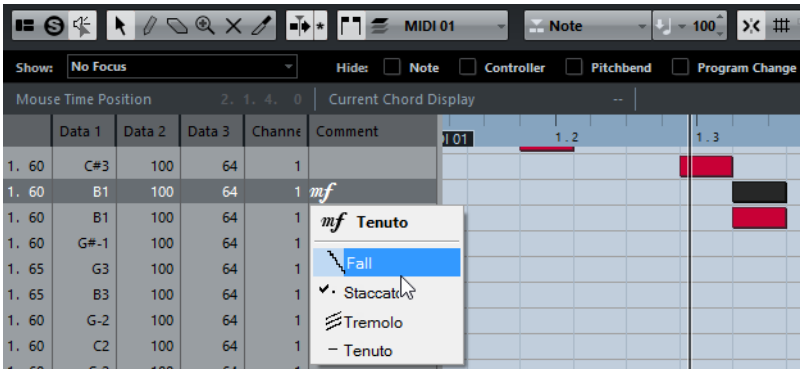
  If you click on an active attribute again on the menu, it is deleted.
- If you select another attribute from the same group for a note, the attribute replaces the previous attribute.

RELATED LINKS

Groups on page 865

Expression maps in the List Editor

In the List Editor, the Articulations can be viewed and edited in the Comment column. The options are the same as on the Key Editor info line.



Directions can be shown either as Text or as Graphic Symbols (like in the Score Editor). Either way, they are followed by the text “VST Expression” in brackets, so as to be easily recognizable and distinguishable from ordinary Score symbols.

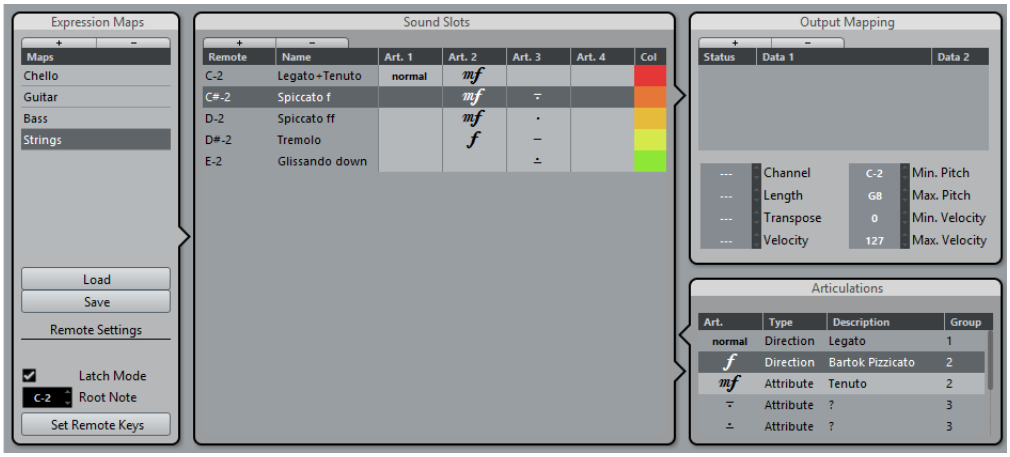
Creating and editing expression maps

Creating an expression map from scratch

PROCEDURE

1. In the Inspector for a MIDI or instrument track, open the Expression Map section, open the pop-up menu and select “Expression Map Setup…”.

   The Expression Map Setup window opens, allowing you to load and create expression maps.



NOTE

You can also open the Expression Map Setup window by selecting the “Expression Map Setup…” option on the MIDI menu.

2. To create a new map from scratch, click the "+" button at the top of the Maps list in the Expression Maps section of the dialog.

   A new map named "Untitled" is shown in the Expression Maps section.

3. Click on the map name and enter a meaningful name (e.g. "Cello" to set up an expression map for a cello).

Creating expression maps based on the key switches used in an instrument

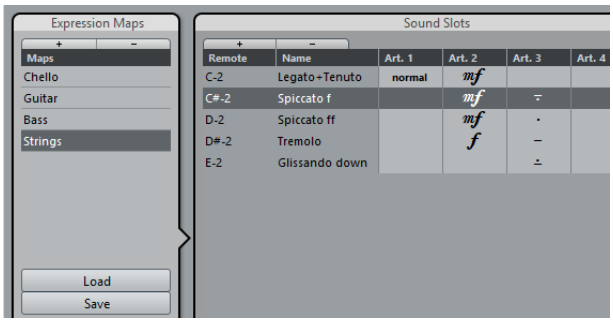
You can automatically extract mapping information from your connected VST instruments and convert it into a new expression map. This makes it very easy to set up expression maps for the instruments you often work with.

PROCEDURE

1. Load the VST instrument you want to use and assign it to a MIDI or instrument track.

2. Select the track, open the Expression Map section in the Inspector, and select "Import Key Switches" on the pop-up menu. Note that this menu option will only be available when the loaded program contains key switches.

   The Expression Map Setup window opens.



3. Make the desired settings for the created map and click the Save button.

   The expression map is saved and can now be loaded via the pop-up menu on the Expression Map section of the Inspector.

RELATED LINKS

Creating an expression map from scratch on page 861

Adding sound slots

Now, you create one sound slot for each articulation that you want to add.

PROCEDURE

1. In the Sound Slots section to the right of the Maps list, a sound slot is added automatically when a new map is created.

   This is the default slot that is used. You can specify an articulation for it or leave it empty, depending on your preferred default setting.

2. Click in the first Articulation column (Art. 1) for the sound slot and select an articulation from the menu.

   A new entry is added in the Articulations section in the lower right corner of the window.

3. When adding articulations, the name of the sound slot is automatically set to the articulation. To change the name, click in the name field and enter a new name.

   The names of the sound slots are displayed in the Inspector for the track.

4. To create a complex articulation, made of several different single articulations, click in the other Articulation columns (Art. 2-4) for the sound slot and add the corresponding articulations.

   For each new articulation, an additional entry is added in the Articulations section.

   - Apart from creating combined articulations, the Articulation columns also allow you to prioritize articulations, by sorting them into different groups.

     When the program is looking for sounds and no exact match is found, the group setting defines the “closest match”, i.e. the sound which matches most criteria when searching from left to right is used. For example, if two sounds are found which have the same articulation in group 1, the sound that also matches group 2 is preferred and so on. For more information on groups, see below.

   - If you cannot find the articulation that you want to add on the pop-up menu, you can define your own articulations by selecting “Add Custom Articulation”.

     This adds a default articulation which you can define in the Articulations section, see below.

   - Click in the “Col” column to assign a color to the current sound slot.

     When working in the MIDI editors, you can color your events according to the color of the sound slots.

5. When you have made the desired settings, click the “+” button again to add another sound slot.

   Add as many sound slots as you need.

   In the Remote column, you can specify the key on your external device that triggers this sound slot.

RELATED LINKS

Expression maps in the Project window on page 857
Remote Key Settings on page 865

Output Mapping

When you have added sound slots, you can map them to certain sound characters or expressions of an instrument, e.g. a bowed violin or a pizzicato violin. The available sounds depend on the instrument that is selected for the MIDI or instrument track. Some of the more complex virtual instruments require multiple key switches or combinations of key switches and controllers to select a particular articulation. This can be accomplished by stacking multiple output events to a single sound slot. You can add a new slot by clicking the “+” button above the list.

You can make the following settings for the slots: In the Status column, you can specify a note-on, program change, or controller message. Additionally, you can make settings in the Data 1 and 2 columns (if applicable). If you have an instrument that uses key switches (for example Steinberg's HALion Symphonic Orchestra), you can specify these key switches here. This allows you to switch between a bowed and a pizzicato violin, or to switch to another program containing a different articulation.

You can also create expressions by editing the incoming MIDI data, for example by changing the note length or velocity. For this, you can make the following settings in the lower part of the Output Mapping section:

Channel

Here you can specify the MIDI channel. When using HALion Symphonic Orchestra for example, this allows you to switch to a different program.

Length

Here you can specify the note length. This way, you can create staccato or tenuto sounds.

Velocity

Here you can specify the desired velocity. This allows you to create accents, for example.

Min. Velocity

If you are using an instrument that has different velocity ranges on the same key, you can specify a minimum velocity here, to make sure that the sample mapped to a particular range is used.

Transpose

This allows you to specify a transpose value. This can be used to select different articulations in some sample libraries, in which different articulations are located on different octaves, for example.

Controller 1/2

These allow you to set MIDI Control Change messages and their values for each sound slot.

Editing Articulations

In the Articulations section, the articulations you added for the sound slots are displayed.

The following settings can be made here:

Art.

Clicking in this column opens a context menu, where you can choose whether you want to insert a symbol or a text string. If you select Symbol, the dialog with the available symbols opens. If you select Text, you can directly enter the desired text.

Type

In this column you specify whether you want to add an “Attribute” (which only influences a single note, e.g. an accent) or a “Direction” (which is valid from the insertion position until it is replaced by another articulation, e.g. arco and pizzicato).

Description

Here, you can enter a descriptive text. For example, this can be the name of the symbol (e.g. Accent) or the long name of a direction (e.g. pizz and pizzicato).

Group

This column allows you to specify the group, or importance of the symbol, see below.

Groups

You can sort the different articulations you define for an expression map into one to four groups. Groups can be used to combine directions and attributes in more complex musical expressions by choosing articulations from the different groups, for example to play a note arco AND staccato AND with an accent.

The groups themselves are exclusive. This means articulations residing within the same group cannot be used together. Since some of the articulations cannot be combined – for example, a violin cannot be played arco (bowed) and pizzicato (plucked) at the same time – these articulations should be placed in the same group.

Furthermore, the groups represent the musical importance, with group 1 having the highest priority (expressions in group 1 are more important than those in group 2, 3, and 4). This setting is required when the expression map does not find an exact match for your data and tries to identify the closest possible sound. Let’s say you have added a staccato symbol and an accent to a note in an editor. In the expression map, you have specified that staccato is in group 2 and the accent is in group 3. The connected instrument, however, does not have a sample that corresponds to these settings. In this case, the program looks for a staccato sound, disregarding the accent.

Remote Key Settings

The remote keys specify which key on an external device is used to play a certain sound slot, i.e. these keys are then used to insert articulations instead of notes.

The active remote keys (if any) are indicated in the Inspector for the track.

NOTE

If you do not plan to record or trigger articulations via a MIDI input device, you do not need to specify remote keys.

RELATED LINKS

Expression maps in the Project window on page 857

Latch Mode

This setting determines whether the remote key function reacts to note-off messages.

- When Latch Mode is deactivated, the key you press on your MIDI input device is valid for as long as the key is held, i.e. the sound slot plays until the key is released.

  On release, the default (first) sound slot is played again.

- When Latch Mode is activated, the key you press is valid until the next key is pressed.

IMPORTANT

Note that Latch Mode can only be generally activated/deactivated in Nuendo, not for single expression maps.

Root Note

Here, you can specify the first key on your external device that you want to use as a remote key. This is useful, since it allows you to automatically adjust existing remote key assignments to suit your needs, for example when you are using a MIDI keyboard with a very wide or very narrow key range.

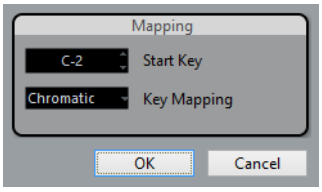
Set Remote Keys

Remote keys can be specified manually for each slot in the Sound Slots section of the window. However, you can also automatically assign a range of keys on your external device to the sound slots in the expression map.

PROCEDURE

1. Click the Set Remote Keys button.

   A dialog opens.

2. Use the Start Key field to specify the first key on the MIDI input device that you want to trigger a sound slot.

3. On the Key Mapping pop-up menu, you can specify with which keys on your device you want to trigger the sound slots.

   You can choose whether you want to use all keys on the keyboard as remote keys, or whether only the white or black keys are used.

4. Click OK to close the dialog.

Saving your settings

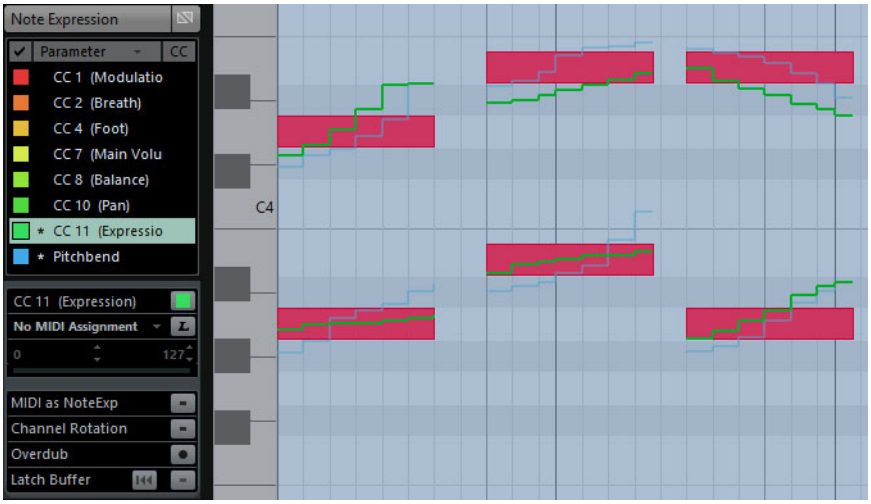
When you have made the desired settings, you need to save the expression map. To do so, click the Save button in the Expression Maps section of the window, specify a file name and a location for the expression map, and click Save.

Note Expression (NEK only)

Introduction

Note Expression offers a very intuitive way of controller editing in Nuendo. As an alternative to working with controller lanes in the Key Editor, controller data can be viewed and edited directly on the associated MIDI note events in the event display.

With Note Expression, a note and its associated controller data are treated as a unit. When you quantize, move, copy, duplicate, or delete notes, all their associated controller information will follow. This allows for a very intuitive and accurate editing of note-related data. The Note Expression values can be edited in various ways. Furthermore, by superimposing the corresponding data curves in the event display, you can view all the Note Expression data for a note simultaneously, which gives you a good overview.



Note Expression curves in the Key Editor

When working with Note Expression, it is important to distinguish between VST 3 controllers and MIDI controllers.

RELATED LINKS

Editing Note Expression data on page 878

VST 3 controllers

VST 3 controllers are provided by the VST instrument. Therefore, different controllers can be available, depending on the instrument.

VST 3 controllers provide articulation information for each individual note. Unlike MIDI controllers (which are channel-specific), VST 3 controllers are note-specific and are suitable for polyphonic contexts. Articulating each note in a chord individually creates a much more natural feel. Furthermore, VST 3 controllers allow for a value range that exceeds the MIDI range of 0 to 127, which offers a more comfortable value editing and fine-tuning.

To be able to work with VST controllers, you need a VST instrument that offers this kind of controller parameters and is capable of playing back these controller messages. Included with Nuendo is HALion Sonic SE, which is compatible with Note Expression.

RELATED LINKS

HALion Sonic SE on page 889

MIDI controllers

A major limitation of MIDI is the nature of controller information. With the exception of poly pressure, controller messages are channel-specific messages, i.e., they affect the entire instrument, regardless of whether they are inserted for a part or a note.

Therefore, when using Note Expression with MIDI instruments (hardware or VSTi), it is important to understand that articulation data on one note usually also affects all other notes of the same voice, i.e. any other note playing on the same channel at the same time. This limits the potential of Note Expression for MIDI controller events to monophonic (solo) performances. When using MIDI controllers in polyphonic performances, we recommend using controller lanes in the Key Editor.

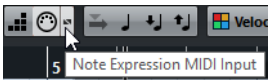
However, Note Expression can be useful in the context of standard VST instruments and MIDI hardware instruments.

RELATED LINKS

Using the Controller Display on page 807
Recording MIDI controllers as Note Expression data on page 886
Converting MIDI Controllers into Note Expression data on page 887

Working with Note Expression

When working with Note Expression, start by activating the “Show Note Expression Data” button on the Key Editor toolbar. This will give you a visual feedback of your actions. Use the slider to the right of the button to modify the display size of the Note Expression data in the event display.



- If you want to listen to your editing, activate the Acoustic Feedback button on the Key Editor toolbar.

  Playback is triggered when you enter or change Note Expression data. All controllers that are present at the mouse position will be used during playback.

Note Expression can be used in the following ways:

- You can record notes live into Nuendo while attaching some or all of the used controllers as Note Expression events to the notes.
- You can replace the existing Note Expression data of a MIDI part by recording Note Expression events for the MIDI notes during playback.
- You can add Note Expression data to one MIDI note after another using the “Note Expression MIDI Input” button.
- You can draw in Note Expression events for MIDI notes in the Note Expression editor.

RELATED LINKS

Recording on page 875
Overdubbing on page 876
Recording Note Expression data via MIDI input on page 877
Editing Note Expression data on page 878

Setting up the Note Expression Inspector tab

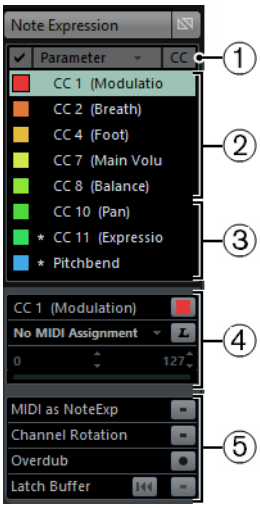
To be able to work with Note Expression, you have to set up the parameters first. This is done on the Note Expression tab in the Inspector of the Project window or the Key Editor.

The top area of the Note Expression tab shows a list of parameters. The VST 3 controllers are shown first, followed by the MIDI controllers. Which VST 3 controllers are available depends on the instrument that is used. The MIDI controllers can be set up in the MIDI Controller Setup dialog.

NOTE

If many controllers are available, you may have to navigate through the list using the scrollbar.

If an asterisk (*) is displayed in front of a parameter name, data for this controller exists. The number to the right of a parameter determines the MIDI controller mapped to the parameter for recording.



1) In the CC column, the controller assignment is shown, if any.
2) VST 3 controllers
3) MIDI controllers
4) Settings for the selected controller
5) Global settings

In the middle section of the tab, you can make settings for the parameter that is selected in the list. The following options are available:

Parameter name and color selector

By clicking on the colored square to the right of the parameter name, you can specify which color is used for the parameter in the Inspector and in the note display. You can also define a Note Expression color set.

MIDI assignment field and pop-up menu

Here, you can specify the MIDI controller assignment for recording for the selected parameter by either selecting it from the pop-up menu or using the MIDI Learn button.

MIDI Learn button

You can assign any control of your external MIDI controller to the selected parameter. Click the MIDI Learn button and move the fader or knob on the external device.

Parameter range controls (Min/Max)

If you want to use only a certain value range of the parameter, you can specify it here. Set the range by changing the minimum and maximum values or use the slider below the fields.

Using a parameter range allows you to make finer settings for certain parameters. This is especially useful for the VST 3 parameter “Tuning”. Specify the range you want to use and enter or record the corresponding data.

In the lower part of the Note Expression tab, the following global settings and parameters are available:

MIDI as Note Expression

If this button is activated, incoming MIDI controllers will be recorded as Note Expression data.

Channel Rotation

If this option is activated, individual MIDI channels are assigned to incoming MIDI notes and their controllers.

IMPORTANT

In order to use the **Channel Rotation** mode, the input controller must support channel rotation.

Overdub

When this is activated, you can overdub existing Note Expression data.

Latch Buffer

With this button, you can activate/deactivate the latch buffer used for overdub recording.

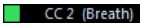
RELATED LINKS

Mapping controllers on page 873
Selecting the Event Type on page 807
Project Colors Dialog on page 1235
Recording MIDI controllers as Note Expression data on page 886
Channel Rotation on page 876
Overdubbing on page 876
Latch mode on page 876

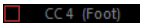
Showing/hiding controllers

You can specify which parameters are displayed in the Note Expression editor and in the event display by activating/deactivating them in the leftmost column in the list. When you want to edit a single parameter, it might be best to hide the data for the other parameters.

Activating several parameters allows you to view them in context, giving you a better overview. In the Inspector, visible controllers are shown with a filled rectangle in front of their name. Hidden controllers are shown with an empty rectangle. To show or hide a parameter, click on its rectangle.

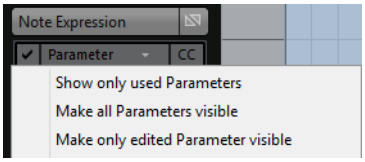


This controller is visible.



This controller is hidden.

Filtering the list



If you click on the Parameter column header, a pop-up menu opens, containing the following filter commands:

Show only used Parameters

Select this command to only display the parameters in the list for which data exists.

Make all Parameters visible

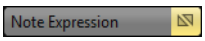
Select this command to display all available parameters in the event display.

Make only edited Parameter visible

Select this command to display only the currently edited parameter in the event display.

Bypassing Note Expression

Like for most other Inspector tabs, you can bypass the Note Expression settings by clicking on the button at the top right of the Inspector tab, so that it lights up yellow. If Bypass is activated, all Note Expression data will be bypassed for the track.



Bypass is active for the Note Expression Inspector tab.

Mapping controllers

External keyboards have no controls or faders for VST 3 parameters, which can therefore not be recorded directly. To remedy this, you have the possibility to assign a certain MIDI controller (or Pitchbend and Aftertouch) to any of the Note Expression parameters in the list. The MIDI assignment is shown in the CC column in the Inspector.

The same MIDI controller can be used for several parameters, but only one of these controllers can be active at a time. If the mapping is active, the number for the assigned MIDI controller is displayed (or PB and AT for Pitchbend and Aftertouch, respectively). If a MIDI controller is assigned but inactive, e.g., because the selected parameter uses the same assignment as another parameter, a dot is shown in the CC column.

The VST 3 parameter Tuning is automatically assigned to the pitchbend wheel of your MIDI controller. All other parameters are assigned by default to the first MIDI controller (CC1: Modulation).

To manually specify the record mapping for the parameters, use the MIDI Learn function, or load a mapping preset, see below.

Manual mapping

To manually map a MIDI controller to the selected Note Expression parameter, you can select the MIDI controller from the MIDI assignment pop-up menu. If the MIDI controller you are looking for is not on the list, select “MIDI Controller Setup…” and activate it in the dialog. This is the same as selecting which controllers are available for the controller lanes in the Key Editor.

RELATED LINKS

Selecting the Event Type on page 807

MIDI Learn

Another way to assign the knobs and faders of your MIDI instrument to Note Expression parameters is using the MIDI Learn function.

PROCEDURE

1. Select the parameter to which you want to assign a MIDI controller.
2. Below the list, click the MIDI Learn button to the right of the MIDI assignment pop-up menu.
3. Use the knob or fader on your MIDI device that you want to assign to the selected Note Expression parameter.

   This control is now automatically assigned.
4. Repeat this step for all the parameters you want to control with your MIDI device.

RESULT

Now, you can record Note Expression data using the controls on your MIDI device.

Using mapping presets

When you have set up the mapping for a connected MIDI device, you can save these settings as mapping presets for future use, e.g. when working again with this device.

PROCEDURE

1. Open the Parameter pop-up menu and select “Save MIDI Input Assignment”.
2. In the file dialog that appears, specify a name and a location for the file.

   A file with the extension “*.neinput” is created.

RESULT

You can recall the mapping presets you created by using the “Load MIDI Input Assignment” command on the Parameter pop-up menu.

Recording

Recording notes and Note Expression data

To record MIDI notes together with Note Expression data using an external MIDI device, proceed as follows:

PROCEDURE

1. Create an instrument track, e.g. using HALion Sonic SE as VST instrument.

   The Note Expression Inspector tab shows which parameters are available for recording.

   - You can also load one of the available presets. Some presets were created especially for the use with Note Expression. These have the suffix “.NoteExp”.
2. Select a parameter from the list.
3. Set up the record mapping for the parameters.

   You can use the data range controls to use only a subrange of the full parameter range. This allows for finer recording and editing.
4. Record some MIDI notes and use the mapped controls on your MIDI device to record the corresponding Note Expression data.
5. Open the Key Editor and activate the “Show Note Expression Data” button on the toolbar.

   The Note Expression data is shown on the notes for which it was recorded.

RELATED LINKS

Mapping controllers on page 873

Channel Rotation

Some input controllers can assign individual MIDI channels to incoming MIDI notes and their controllers. Each new MIDI note event gets its own internal MIDI channel and all controller that belong to this note event are created with the same MIDI channel. This allows a 16 voice polyphony, which is sufficient for most performances.

The **Channel Rotation** mode allows a correct mapping of these data as Note Expression data per note event. This reduces the amount of data in comparison to the MIDI to Note Expression conversion method.

IMPORTANT

In order to use the **Channel Rotation** mode, the input controller must support channel rotation.

RELATED LINKS

Setting up the Note Expression Inspector tab on page 870

Overdubbing

You can also record or replace Note Expression data for existing notes. This is achieved by overdubbing. To activate this mode, click the Overdub button on the Note Expression Inspector tab. When this is activated, no notes are recorded when you click the Record button. Instead, you can use the controls on your MIDI device to record Note Expression data for the note that is playing.

IMPORTANT

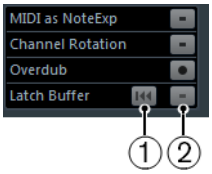
- To be able to record MIDI notes again, you have to deactivate the Overdub button when you have finished recording the Note Expression data.
- If notes are selected when you start overdubbing, controllers will be recorded for these notes only. To record controllers for all notes touched by the position cursor, make sure to deselect all notes in the event display before you start overdubbing.

Latch mode

When Nuendo receives controller data from an external MIDI device, this information, i.e. the setting of the faders and knobs on the device, is automatically written to the Latch buffer. By activating Latch mode when overdubbing Note Expression data, you can add the data in the Latch buffer to the notes while these are played back. This can be useful when you want to overdub Note Expression data starting at specific controller values (i.e. at predefined initial knob or fader settings), for example.

To use Latch mode, start by mapping each control to one of the available VST 3 parameters. Then activate the Latch buffer button and set the knobs and faders on the MIDI controller to the desired values.

When you now start overdubbing, the values for all these controls are attached to the notes that are passed during overdub recording, replacing any existing controller data of the same type.



1) Reset Latch Buffer
2) Click here to activate Latch mode.

RELATED LINKS

Mapping controllers on page 873

Resetting the Latch buffer

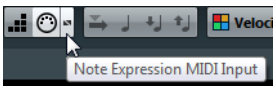
Whenever data is present in the Latch buffer, the “Reset Latch buffer” button becomes available. If you click this button, all the memorized values are removed from the Latch buffer.

NOTE

When you are using Latch mode in combination with cycle recording, the Latch Buffer is automatically reset at the end of the cycle.

Recording Note Expression data via MIDI input

An alternative way to enter Note Expression data for existing notes is using Note Expression MIDI input. When you activate the “MIDI Input” and “Note Expression MIDI Input” buttons on the Key Editor toolbar, you can replace the controllers for the selected note.



- To record Note Expression data via MIDI input, select a note and move the active control on your MIDI device.

  The note is played in real time and any manipulation of the controls, i.e. all incoming controller data, is recorded for this note. Recording stops when the end of the note or the end of the release phase is reached, or when you deselect the note.

RELATED LINKS

Editing the release phase of a note on page 883

Recording the sustain pedal

When the sustain pedal (MIDI CC 64) of the connected MIDI device is held during recording, the following applies for VST 3 parameters (not for continuous MIDI controllers):

- When a note-off event is received (when the key on the connected keyboard is released), this message is not sent to the VST 3 instrument but is instead created by the program when the sustain pedal is released.

  This makes it possible for the VST 3 instrument to play back controllers that are sent after a key was released.

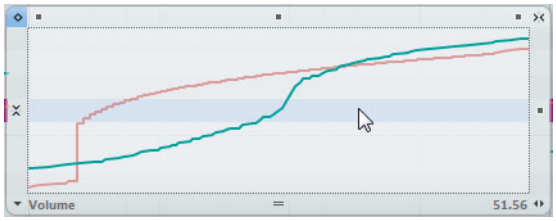
- The release phase of the recorded notes ends when the sustain pedal is released.

Editing Note Expression data

In the Key Editor, you can view and edit the Note Expression data for notes in the Note Expression editor. This is opened by double-clicking a note in the event display. In the editor, you can add Note Expression data from scratch. All parameters that are marked as visible in the Inspector are displayed as curves in the editor.

NOTE

When several notes are selected in the Key Editor and you double-click any of them, the Note Expression editor opens for all these notes. This is useful if you want to edit all notes in a chord in the same way, for example.



- To adjust the editor size, click and drag the Resize handle (in the center of the lower border of the editor). This allows you to switch between three different window sizes.

- To navigate from note to note while the editor is open, use the left and right arrow keys.

  You can also use the key commands [Tab] and [Shift]-[Tab] to step through the notes.

To make settings in the editor, first select the parameter that you want to make settings for. How to do this depends on whether you want to modify existing data or enter new data from scratch:

- If you want to enter new data from scratch, i.e. create events for a parameter that has not been used yet, you have to select this parameter in the Inspector to make it available in the editor.
- If you want to edit existing data, you specify which parameter to edit in one of the following ways: by clicking on the curve, by selecting the corresponding controller on the Parameter pop-up menu, or by selecting the parameter on the Note Expression Inspector tab.

  The parameter pop-up menu in the lower left corner of the editor lists all parameters that are used for the edited note. If the editor size is big enough, the name of the edited parameter is displayed to the right of the pop-up menu.
- You can close the editor by clicking outside of it in the event display.

  You can also specify a key command for opening and closing the Note Expression editor.

The value display

The value display in the lower right corner of the editor shows the current value at the (vertical) mouse pointer position. The value range differs depending on the parameter type, e.g. 0 to 127 for MIDI controllers or semitones and cents for Tuning.

Selection ranges

You can select a range of controller values by clicking and dragging in the editor with the Object Selection tool.

- If you hold down [Shift] and drag, any previous selection will be kept.
- You can move selections by dragging them in the editor.
- To copy a selection in the editor, click on it, keep the mouse button pressed, then press [Alt]/[Option] and drag.

Editing functions

Drawing in data

You can enter or modify curves using the Draw tool or the line tool. The editing is the same as in the controller lanes. If the Object Selection tool is selected and the editor is open, you can press [Alt]/[Option] to get the Draw tool.

RELATED LINKS

Adding Events in the Controller Display on page 809
Editing Events in the Controller Display on page 810

Using Cut, Copy, and Paste

- To cut, copy, and paste Note Expression data for a single parameter in the editor, use the corresponding commands on the Edit menu.

  It is also possible to copy and paste data between different parameters.

NOTE

Pasting Note Expression data in the editor is restricted to the note (or notes, if they are located at the same time position) for which the editor is open. However, you can copy all Note Expression data from one note to another using a key command.

- To paste all the Note Expression data from one note to other notes, set up the key command “Paste Note Expression” in the Key commands dialog (Note Expression category).

  This pastes all the Note Expression information of one or several notes for which you have used the Copy command into the currently selected notes.

Using the “Paste Note Expression” command, you can copy the settings you made for one note into several other notes, or copy the settings for several selected notes into a number of other notes (which makes it easy to recreate specific drum patterns, for example).

If Note Expression data is copied from several source notes to a number of destination notes, the following applies:

- If the number of the source and destination notes matches, the data of the first “source” note is pasted into the first “destination” note, the data of the second source note into the second destination note, etc.
- If the number of source notes is smaller than the number of destination notes, the source note data will be pasted repeatedly into the destination notes in the order in which they appear.

  When you copy the data from two source notes into four destination notes, for example, the first destination note gets the Note Expression data from the first source note, the second destination note the data of the second source note, the third destination note the data of the first source note and the fourth destination note the data of the second source note.

Deleting Note Expression data

To delete all or the selected Note Expression data, use the Delete command on the Edit menu or press [Backspace].

Moving Note Expression data

- To move all or the selected data of the active parameter, click with the Object Selection tool in the editor (not in the stretch area at the bottom of the window) and drag.

  You can restrict the direction to vertical or horizontal by pressing [Ctrl]/[Command] while dragging. When you hold down [Alt]/[Option] while dragging, the data is copied instead.

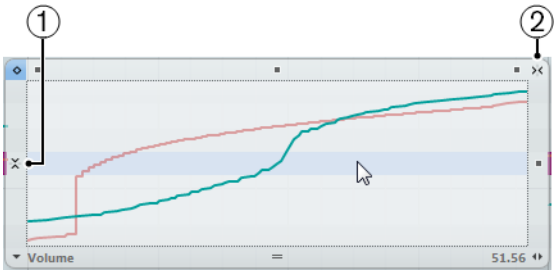
Fixed values

- To enter or edit a fixed value (i.e. a straight line), activate “One-Shot Mode” mode by clicking the button in the upper left corner of the window and click with the Draw tool anywhere in the editor to set the value.

  Note that some VST 3 parameters are one-shot only. For these, this mode is automatically activated.

The snap controls

The horizontal snap button in the upper right corner of the editor corresponds to the Snap button in the Project window.



1) Vertical snap (best suited for the Tuning parameter)

2) Horizontal Snap

The Vertical Snap button in the middle of the left border of the editor is especially useful for the Tuning parameter. It allows you to enter the pitch in semitone steps instead of as a continuous curve. This way, it is much easier to create fast pitch modulations.

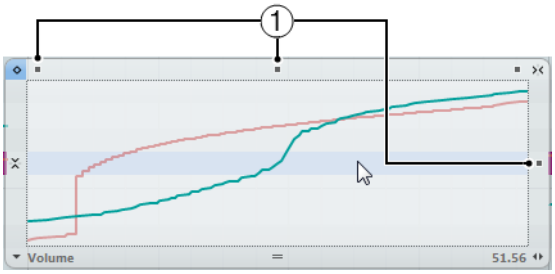
- To temporarily switch to vertical snapping while editing, hold down [Shift].

RELATED LINKS

Snap Function on page 62

Modifying the data using the smart controls

The editor offers various modes for editing the Note Expression data. Most editing modes are activated by clicking the various smart controls, situated on the editor frame.



1) Smart controls

Which editing is performed is reflected by the shape of the mouse pointer. The following modes are available:

Editing mode	To activate this mode…	Description
Move Vertically 	Click in an empty area on the upper border of the editor.	This mode allows you to move the entire curve up or down, which is useful to boost or attenuate a curve.
Scale Vertically 	Click the smart control in the middle of the upper border of the editor.	Use this mode to relatively scale the curve, i.e. to raise or lower the values in percent (not by absolute amounts).
Tilt the left/right part of the curve 	Click the smart control in the upper left/right corner of the editor.	These modes allow you to tilt the left or the right part of the curve, respectively. This is useful if the curve form is exactly the way you want it, but the start or end needs to be boosted or attenuated a bit.
Compress the left/right part of the curve 	[Alt]/[Option]-click the smart control in the upper left/right corner of the editor.	These modes allow you to compress the left or the right part of the curve. You can create a vibrato using the line tool in sinus mode, for example, and then compress its start and end to get a more natural effect.

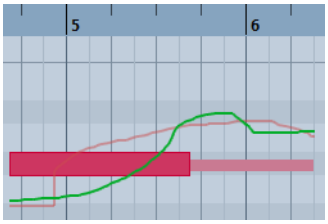
Editing mode	To activate this mode…	Description
Scale Around Absolute Center 	Click the smart control in the middle of the right border of the editor.	This mode allows you to scale the curve around the absolute center, i.e. horizontally around the center of the editor. This is useful for parameters which contain a center value or position, such as Pitchbend or panorama.
Scale Around Relative Center 	[Alt]/[Option]-click the smart control in the middle of the right border of the editor.	This mode allows you to scale the curve relative to its center. This can be used to boost or reduce vibrato, for example.
Stretch 	Click and drag in the lower part of the editor.	This allows you to stretch all or the selected Note Expression data.You can apply the stretching to all visible curves at the same time by keeping [Shift] pressed while dragging.

Editing the release phase of a note

Sometimes it can be necessary to edit the release phase of a note, e.g. to work on the tail of a note which is still sounding after the note-off message was sent. These settings are made in the release section of the editor. To add a release phase, click and drag the release length handle in the lower right corner of the editor.

1) Note
2) Release phase
3) Release length handle

When Note Expression data are displayed in the Key Editor, the release phase of a note is also shown.



Setting the length of the release phase

To determine the length of the release phase, drag the release length handle or enter the value manually on the info line. You can also modify the release length after having edited or recorded controller data. Only the controllers within the specified length will be heard during playback.

NOTE

When you have opened the editor for several notes and hold down [Alt]/[Option] while setting the release length for one note, the release phase of all the notes will be changed accordingly, i.e. they will all end at the same time position.

Adding controllers in the release phase

You can add controllers in the release phase by overdubbing or by manually entering Note Expression data in the editor. When you are overdubbing Note Expression data, the length of the existing release phase will be used to associate newly recorded data to the notes. When the sustain pedal of your external device is held during recording, the notes automatically get a corresponding release phase.

Editing multiple notes simultaneously

When you have opened the editor for several notes, any editing (e.g. entering Note Expression data, applying time stretch or modifying the length of the release phase) affects all the notes that are present at the time position where you perform the editing.

Note Expression and MIDI

Making global settings

In the Note Expression MIDI Setup dialog, you can make some global settings for the use of the Note Expression functionality with MIDI. In this dialog, you can specify exactly which MIDI controllers will be used when recording Note Expression data, for example.

PROCEDURE

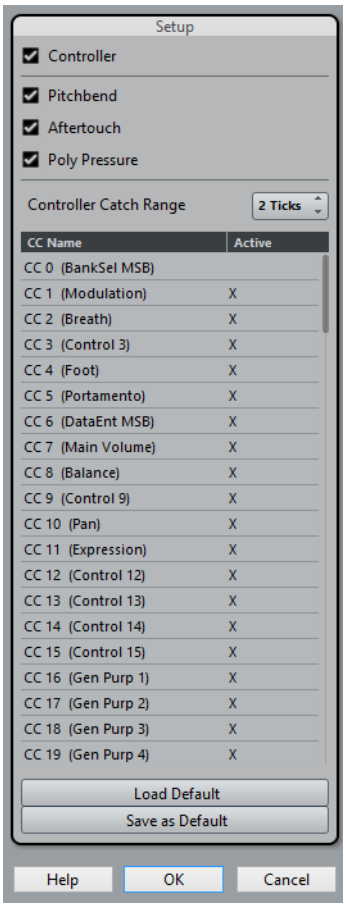
1. On the MIDI menu, open the Note Expression submenu and select “Note Expression MIDI Setup…”.

   The Note Expression MIDI Setup dialog opens.

2. When you have made the desired settings, click OK to close the dialog.

   The settings you made in the Note Expression MIDI Setup dialog will be used every time that you use the “Convert to Note Expression” function or record MIDI controllers as Note Expression data.

Note Expression MIDI Setup Dialog



The dialog contains the following options:

Controller

Activate this option if you want to use MIDI controllers when working with Note Expression. In the table below, activate the MIDI controllers you want to use and deactivate the MIDI controllers that should be disregarded in the Note Expression context.

If MIDI controller data for a deactivated controller is received in Nuendo, it will end up on the controller lane.

Pitchbend

Activate this option if you want incoming Pitchbend data to be used when working with Note Expression.

Aftertouch

Activate this option if you want incoming Aftertouch data to be used when working with Note Expression.

Poly Pressure

Activate this option if you want Poly Pressure data to be used when working with Note Expression.

Controller Catch Range

This allows you to associate controllers with a note, although they were sent slightly before the note-on message. Specify the number of ticks in the value field. For example, this might be necessary when working with some electronic drums for which the drum head position message is sent before the note.

Recording MIDI controllers as Note Expression data

To record Note Expression data using standard MIDI controller messages, activate the “MIDI as Note Expression” button on the Note Expression Inspector tab and enter the notes and controllers using your MIDI device. Afterwards, you can copy, paste and move the notes and the associated controller data will follow.

However, you should not shift individual notes from a chord, because this leads to conflicting controller messages. One way to avoid such conflicts is to record MIDI controllers as Note Expression data for monophonic performances only. Another option is to use a MIDI track set to “Any” channel and to split polyphony to separate channels. This is useful when working with guitar-to-MIDI controllers, where each string sends on a separate MIDI channel.

NOTE

When recording MIDI controllers as Note Expression data, keep in mind that this only works within the limits of standard MIDI controllers. With the exception of Poly Pressure, all MIDI controllers are channel-specific messages and therefore not available for notes.

IMPORTANT

When you are editing the MIDI notes after recording them, it might be necessary to consolidate the controller data.

Converting MIDI Controllers into Note Expression data

You can also convert the MIDI controller data on the controller lanes into Note Expression data.

PROCEDURE

1. Open the MIDI part in the Key Editor.
2. Make sure that the MIDI controllers to be recorded are activated in the “Note Expression MIDI Setup” dialog.
3. On the MIDI menu, open the Note Expression submenu and select “Convert to Note Expression”.

   The MIDI data of the types you specified in the Note Expression MIDI Setup dialog is converted from controller lane data into Note Expression data, leaving the corresponding controller lanes empty.

RESULT

During this process, the program searches for notes that are sounding at the same time as the controllers and if several notes are playing at the same time, the same Note Expression parameters will be attributed to them, with the same values.

NOTE

When converting MIDI controllers into Note Expression data, release phases are automatically created where necessary, so that no controller data is lost during this process.

IMPORTANT

When you are editing the MIDI notes after the conversion, it might be necessary to consolidate the controller data.

RELATED LINKS

Editing the release phase of a note on page 883

Consolidating MIDI overlaps

It can be problematic to convert regular MIDI controllers into Note Expression data or to edit MIDI controllers which have been recorded as Note Expression data. For example, when you move notes so that they overlap other notes containing the same controllers (e.g. by moving or quantizing), these controllers are conflicting. This might cause trouble, especially for connected MIDI devices.

You can eliminate such controller conflicts using the “Consolidate Note Expression Overlaps” command on the Note Expression submenu of the MIDI menu. When you select this command, the following happens:

- If notes overlap that contain data for the same controller, the controller values of the second note are used from the beginning of the overlap.
- If a note is moved so that it is positioned entirely within a longer note and if these notes contain controller data for the same controller, the controller values of the longer note are used until the encompassed note starts. The controllers for the “embedded” shorter note are used for the entire length of that note. At the end of the shorter note, the controllers of the longer note are used again.

Distributing notes to different channels

If you do not have a VST 3 instrument, but still want to use the Note Expression functions, proceed as follows:

PROCEDURE

1. Add a multi-timbral instrument, open its control panel, and assign the same sound to different channels.
2. In the Inspector for the corresponding MIDI track, make sure the MIDI output pop-up menu is set to “Any”.
3. Enable the “MIDI as Note Expression” button and record or enter MIDI notes with expression as needed.
4. On the MIDI menu, open the Note Expression submenu and select “Distribute Notes to MIDI Channels”.

   This will distribute the MIDI notes to different channels (starting at channel 1).
5. Edit Note Expression for each note independently without controller conflicts.

Dissolving Note Expression data

- To convert Note Expression data into MIDI controller data on controller lanes, select the “Dissolve Note Expression” option from the Note Expression submenu on the MIDI menu.

  Note that this applies only to Note Expression data that consists only of MIDI controllers (i.e. not the VST 3 controller data).

Removing all Note Expression data

- To delete all the Note Expression data for the current selection, open the MIDI menu and, on the Note Expression submenu, select “Remove Note Expression”.

Trimming Note Expression data

When you reduce the release length of a note after entering Note Expression data for the release phase, some of the data ends up behind the release phase, thereby becoming unused.

- To keep only those Note Expression events that are actually used, select the notes and select “Trim Note Expression to Note Length” from the Note Expression submenu on the MIDI menu.

  This will delete any Note Expression data present after the end of the release phase for the notes.

HALion Sonic SE

HALion Sonic SE is a VST 3-compatible VST instrument. For use with Note Expression, it offers the VST 3 parameters “Tuning” (Pitch), “Volume”, and “Pan”. HALion Sonic SE comes with several presets (with the file name extension “*.NoteExp”) that can be used with Note Expression. Use them to get a quick overview of the possibilities HALion Sonic SE offers when working with Note Expression.

For detailed information about HALion Sonic SE and its parameters, refer to the separate PDF document HALion Sonic SE.

NOTE

You can also open the Project Browser to have all the Note Expression data shown in a list.

RELATED LINKS

Project Browser on page 1002

Chord Functions (NEK only)

The chord functions provide you with many possibilities for working with chords.

The chord functions allow you to:

- Build chord progressions by adding chord events to the chord track.
- Convert chord events to MIDI.
- Use the chord track to control audio playback or MIDI playback.
- Use the chord track voicing to change the pitches of your MIDI.
- Extract chord events from MIDI data to get an overview of the harmonic structure of a MIDI file.
- Record chord events with a MIDI keyboard.

RELATED LINKS

Chord Editing Section (NEK only) on page 802

Chord Track

The chord track allows you to add chord events and scale events.

RELATED LINKS

Scale Events on page 899
Chord Events on page 891

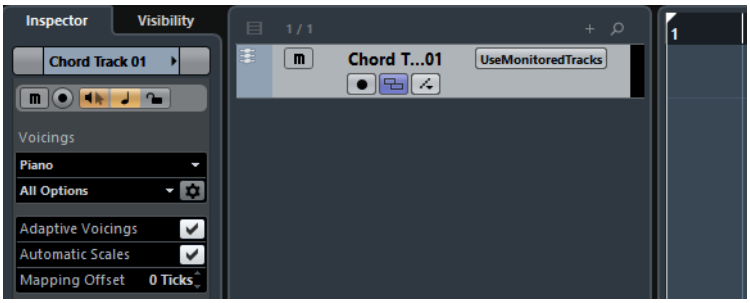
Adding the Chord Track

PROCEDURE

- Select **Project > Add Track > Chord**.

RESULT

The chord track is added to your project.

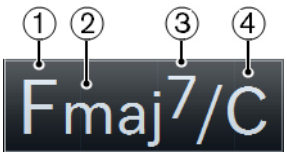


Chord Events

Chord events are representations of chords that control or transpose playback on MIDI, instrument, and audio tracks.

Chord events alter the pitches of MIDI notes and VariAudio segments, if their tracks are set up to follow the chord track.

Chord events have a specific start position. Their end, however, is determined by the start of the next chord event. They can have a root note, a type, a tension, and a bass note:



1) Root note
2) Type
3) Tension
4) Bass note

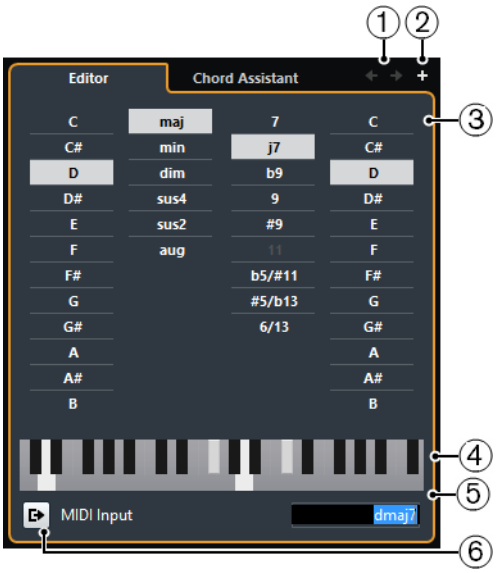
RELATED LINKS

Controlling MIDI or Audio Playback using the Chord Track on page 904

Chord Editor

The **Chord Editor** allows you to define or change chord events, and to add new chord events.

- To open the **Chord Editor**, double-click a chord event.



1) **Go to Previous/Next Chord**

Allow you to select the previous/next chord on the chord track for editing.

2) **Add Chord**

Adds a new undefined chord event on the chord track.

NOTE

This works only if the last chord event on the chord track is selected.

3) **Chord definition buttons**

Activate these buttons to define a root note, a chord type, a tension, and a bass note for your chord event.

NOTE

If you do not select a separate bass note, the setting is linked to the root note, so that no extra bass note is heard.

4) **Keyboard display**

Shows the notes of the chord event, considering the current voicing settings.

5) **Define Chord by Text Input**

Allows you to define a chord using the computer keyboard.

6) **Activate MIDI Input**

Allows you to define a chord by playing a chord on your MIDI keyboard. If the chord is recognized, it is reflected by the chord buttons and the keyboard display.

Adding Chord Events

PREREQUISITE

Add the chord track.

PROCEDURE

1. Select the **Draw** tool and click in the chord track.

   An undefined chord event named X is added.
2. Select the **Object Selection** tool and double-click the chord event.
3. In the **Editor**, select a root note.
4. Optional: Select a chord type, tension, and bass note.
5. Do one of the following:
   - To close the **Editor**, click anywhere outside the **Editor**.
   - To add a new undefined chord event, click **Add Chord**.

RELATED LINKS

Adding the Chord Track on page 890

Defining Chords By Text Input

In the chord **Editor**, you can use the text input field to define a chord with the computer keyboard.

PROCEDURE

1. Double-click a chord event to open the chord **Editor**.
2. Click in the text input field at the bottom of the **Editor**.
3. Enter a chord by performing the following actions:
   - Define a root note, for example, C, D, E.
   - Define accidentals, for example, # or b.
   - Define the chord type, for example maj, min, dim, sus, or aug.

- Define a chord extension, for example 7, 9, or 13.

NOTE

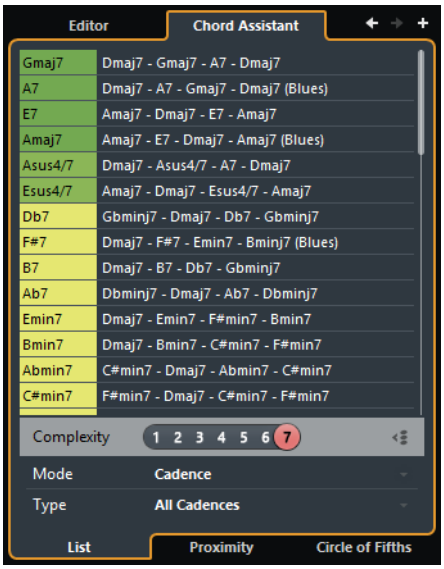
If you have activated **Solfège** in the **Note Name** pop-up menu (**File > Preferences > Event Display > Chords**), you can also enter chords in this format. You must capitalize the first letter and write “Re” instead of “re”, for example. Otherwise, the chord is not recognized.

4. Press [Tab] to add a new chord and define it.

Chord Assistant

The **Chord Assistant** allows you to use a chord as a starting point to get suggestions for the next chord.

- To open the **Chord Assistant**, in the **Chord Editor**, click **Chord Assistant**.



The **Chord Assistant** has the following modes:

- List
- Proximity
- Circle of Fifths

Chord Assistant – List

The **List** mode of the **Chord Assistant** allows you to create harmonic chord progressions based on harmonic rules that can be more or less complex.

1) **Go to Previous/Next Chord**

   Allow you to select the previous/next chord on the chord track for editing.

2) **Add Chord**

Adds a new undefined chord event on the chord track.

NOTE

This works only if the last chord event on the chord track is selected.

3) **Suggestions**
Shows suggestions for the next chord. Click a chord suggestion to select it.

4) **Complexity Filter**
Allows you to increase the complexity and thus the number of suggestions. The higher the complexity, the more suggestions you get.

5) **Gap Mode**
Activate this button to get suggestions for the chords in between two defined chords based on the previous and the next chord.

Deactivate this button to get suggestions for the next chord based on the previous chord.

NOTE

For this to work you must select all undefined chords in between two defined chords.

6) **Algorithm Mode**
Select **Cadence** to build up a chord progression based on cadences. Select **Common Notes** to build up a progression by specifying how many common notes the chords should share.

7) **Cadence Type**

NOTE

This option is only available, if you selected **Cadence** as **Algorithm Mode**.

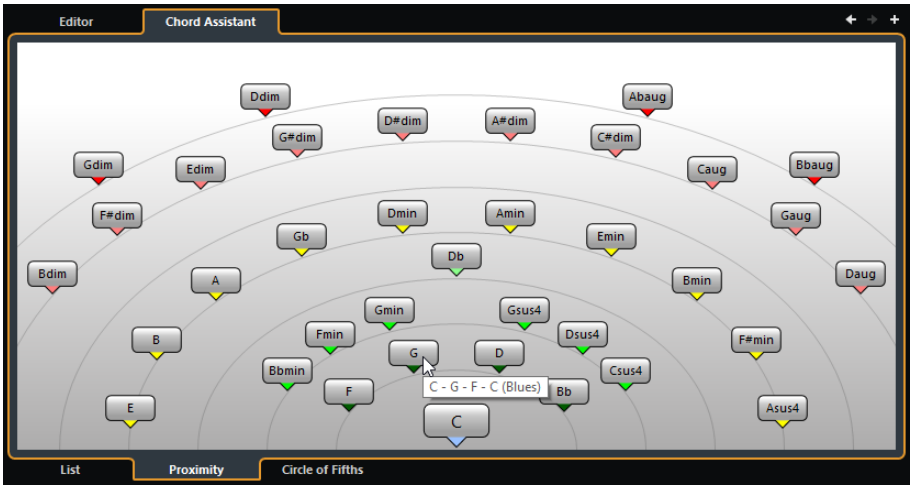
Allows you to select a cadence type for the suggestions. This way, only the chords with specific harmonic functions are suggested.

8) **Chord Assistant tabs**
Click the tabs to open one of the chord assistant modes.

Chord Assistant – Proximity

The **Proximity** mode of the **Chord Assistant** takes a set of harmonic rules into account to offer suggestions that match the origin chord.

If you open the **Chord Assistant** for a chord event, the previous event is set as origin chord. This is shown in the bottom center of the **Chord Assistant**. The farer away a suggestion is situated from the origin chord in the graphic, the more complex the suggestion. The suggested chords are triads or 4-note chords.



- To assign a chord to the selected chord event and play it, click it.

  The last three suggested chords that you clicked are shown with a highlighted frame.

NOTE

- If you move the mouse pointer over one of the suggestions in the **Chord Assistant**, a tooltip with suggestions for progressions is shown.
- The **Proximity** mode underlies the same rules as the **List** mode.

Adding Chord Events Based on Suggestions

If you do not know what your chord progression should look like, you can use the **Chord Assistant** to get suggestions for the following chords.

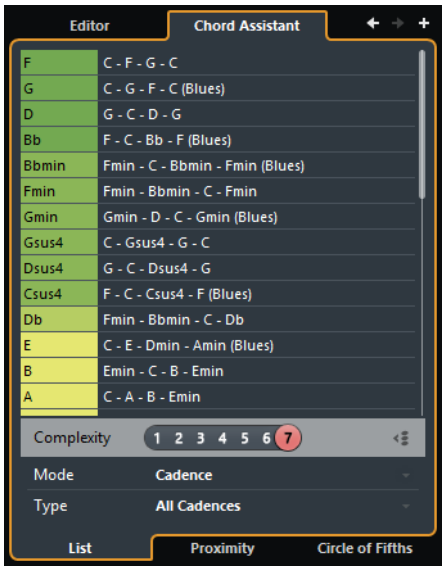
PREREQUISITE

Add a chord event on the chord track.

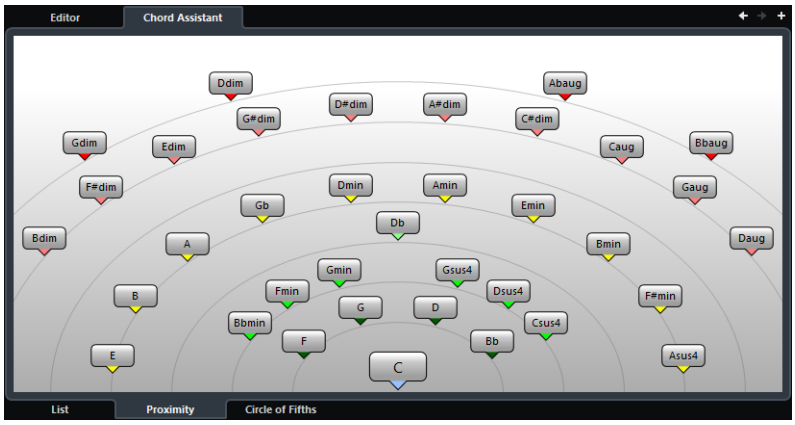
PROCEDURE

1. Double-click the chord event.
2. Click **Chord Assistant**.
3. Click **Add Chord**.
4. Do one of the following:

- To display the suggestions in a list, click the **List** tab.



- To display the suggestions in a graphic, click the **Proximity** tab.



5. Click a suggestion to select it.

RESULT

The suggested chord is added as chord event to the chord track. Repeat the steps above to create as many chord events as required by your harmonic structure.

Chord Assistant – Circle of Fifths

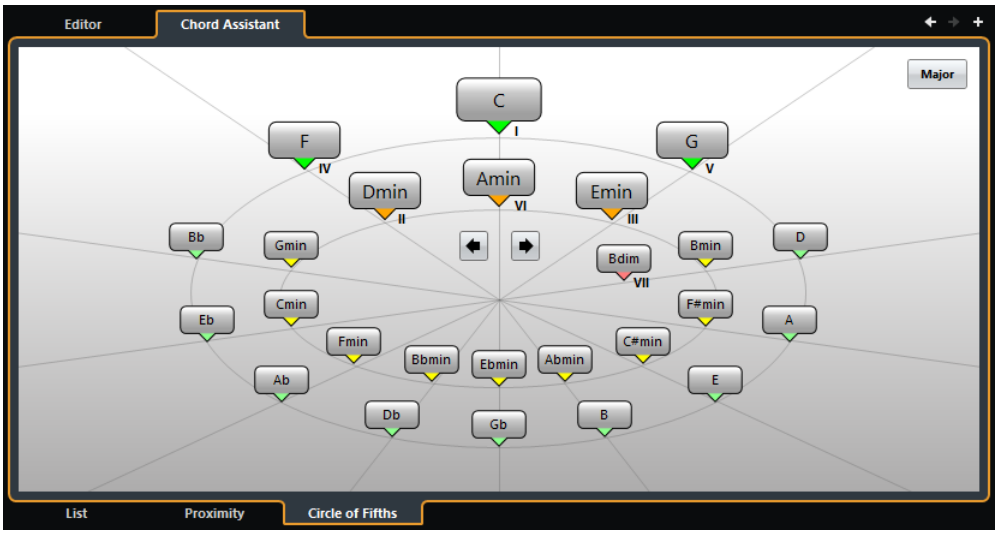
The **Circle of Fifths** mode of the **Chord Assistant** shows the chords in an interactive visualization of the circle of fifths.

The origin chord that defines the current key is shown in the center of the **Chord Assistant** and is marked as tonic (I).

The outer circle shows the twelve major chords ordered in intervals of fifths.

The inner circle displays the corresponding parallel minor chords.

The roman numerals mark the chords of the current key with their scale degree. You can use these chords to create typical chord progressions or you can use the other chords for more creative results.



- To play a chord and assign it to the selected chord event, click it.

  The last three chords that you clicked are shown with a highlighted frame.

- To define a new key, right-click the chord in the **Chord Assistant** and select **Use as Origin**, or use the **Rotate Left/Rotate Right** controls.

- To select the parallel minor chord and define it as key, click **Major/Minor**.

Auditioning Chord Events

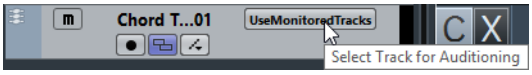
To hear the chord events on the chord track, you must connect the chord track to the output of an instrument or a MIDI track.

Prerequisite

Add the chord track and some chord events.

Procedure

1. Do one of the following:
   - To add an instrument track, select **Project > Add Track > Instrument**.
   - To add a MIDI track, select **Project > Add Track > MIDI**.
2. Assign a VST instrument to your instrument or MIDI track and select a sound.
3. In the chord track **Inspector**, activate **Acoustic Feedback**.
4. From the **Select Track for Auditioning** pop-up menu, select the track that you want to use for auditioning.



RESULT

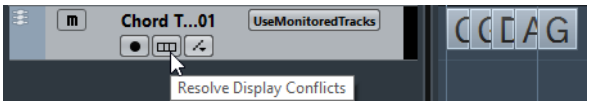
The chord events on the chord track now trigger the sound of the assigned instrument on the MIDI or instrument track.

Changing How Chord Events Are Displayed

You can change how chord events are displayed. This is useful, if chord events overlap each other at low zoom levels, or if you do not like the font type.

PROCEDURE

1. On the chord track, activate **Resolve Display Conflicts**.



2. Select **File > Preferences > Event Display > Chords** and set up the chord font.

   Here you can also determine the note name and naming format.

Scale Events

Scale events inform you which chord events fit in a specific sequence of notes that belong to a specific root note.

Nuendo automatically creates scale events for your chord events.

- To show the scale events, activate **Show Scales** on the chord track.

- To audition the notes that belong to a scale event, click it.

However, you can also add and edit scale events manually.

Scale events have a specific start position. Their end is determined by the start of the next scale event.

Editing Scale Events

PREREQUISITE

Add the chord track and chord events. Deactivate **Automatic Scales** in the chord track **Inspector**.

PROCEDURE

1. On the chord track, activate **Show Scales**.

   The scale lane is displayed.

2. Select the chord event.

   A scale event is shown on the scale lane.

3. Do one of the following:

   - Click the first scale event on the chord track, and on the info line, select a **Root Key** and **Type**.

   - Double-click the scale event, and in the keyboard that appears, select a **Root Key** and **Type** of the scale.

     The keys that correspond to the scale are highlighted.

Voicings

Voicings determine how chord events are set up. They define the vertical spacing and order of the pitches in a chord, but also the instrumentation and genre of a musical piece.

For example, a C chord can be spread over a wide range of pitches, and a pianist will choose different notes than a guitarist. The pianist may also play completely different pitches for different musical genres.

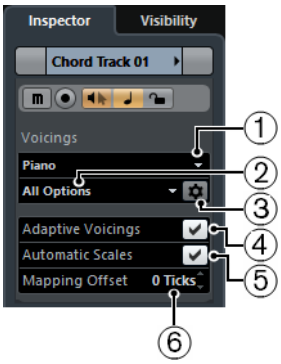
- You can set up voicing for the entire chord track in the chord track **Inspector**.
- You can set up voicings for individual chord events on the **Voicing** pop-up menu on the info line.

NOTE

If **Adaptive Voicings** is activated in the chord track **Inspector**, you can only change the voicings for the first chord event on the info line.

Setting up Voicings

To set up voicings for the entire chord track, you can use the chord track **Inspector**.



1) **Voicing library**

Allows you to select **Guitar**, **Piano**, or **Basic** as a voicing library.

2) **Voicing library subset**

NOTE

This is only available, if **Guitar** or **Piano** is set as voicing library.

Allows you to select a preset voicing library subset.

3) **Configure voicing parameters**

Allows you to configure your own voicing parameters for a specific voicing scheme.

4) **Adaptive Voicings**

Activate this to let Nuendo set the voicings automatically. This prevents the individual voices from jumping too much.

5) **Automatic Scales**

Activate this to let Nuendo set the scales automatically.

6) **Mapping Offset**

If you enter a negative number of ticks, the chord events will affect the MIDI notes that have been triggered too early.

Configure Voicing Parameters

If you click **Configure Voicing Parameters** in the **Voicings** section of the **Inspector**, you can configure your own voicing parameters for a specific voicing scheme.

NOTE

The **Start Voicing** section for piano, guitar, and basic voicings lets you select a start voicing. This is only available for MIDI, instrument, and audio tracks, but not for the chord track, and only if you select **Voicings** in the **Follow Chord Track** pop-up menu.

In the **Style** section for **Piano** voicings, you can set up the following parameters:

Triads

Sets a triad. Chords with more than three notes are not changed.

Triads with maj9

Sets a triad with a major ninth, but without root note. Chords with more than three notes are not changed.

Triads with maj9 and min9

Sets a triad with a major and a minor ninth, but without root note. Chords with more than three notes are not changed.

4-note chords

Sets a default 4-note chord without root note. Chords with less than three notes are not changed.

4-note chords (Open Jazz)

Sets a 4-note chord without root note and without fifth. Chords with less than three notes are not changed.

5-note chords

Sets a 5-note chord with a ninth. Chords with less than four notes are not changed.

In the **Options** section for **Piano** voicings, you can set up the following parameters:

Add Root Note

Adds a root note.

Duplicate Root

Duplicates the root note.

Fatten up

Duplicates the tenor.

In the **Voicing Range** section for **Piano** voicings, you can set up the following parameters:

Lowest Root Note

Sets the limit for the lowest root note.

Lowest Note

Sets the limit for the lowest note, except the root note.

Highest Note

Sets the limit for the highest note, except the root note.

In the **Style** section for **Guitar** voicings, you can set up the following parameters:

Triads

Sets a triad with four, five or six voices.

4-Note Chords

Sets a 4-note chord with four, five or six voices without tensions.

3-String Triads

Sets a three string triad.

Modern Jazz

Sets 4-note, 5-note, and 6-note chords, partly without root note, but with tensions.

For **Basic** voicings only **Octave Offset from C3** is available. This allows you to determine an offset value for the default octave range.

Converting Chord Events to MIDI

You can convert chord events to MIDI for further editing or for printing a lead sheet in the **Score Editor**.

PROCEDURE

1. Add an instrument track or a MIDI track.
   - To add an instrument track, select **Project > Add Track > Instrument**.
   - To add a MIDI track, select **Project > Add Track > MIDI**.
2. Do one of the following:
   - To convert all chord events to MIDI, select **Project > Chord Track > Chords to MIDI**.
   - To convert only selected chords to MIDI, select the chord events and drag them to the MIDI or instrument track.

RESULT

A new MIDI part is created, containing the chords as MIDI events.

Assigning Chord Events to MIDI Effects or VST Instruments

PREREQUISITE

Create a chord progression on the chord track and add a MIDI or instrument track to your project.

PROCEDURE

1. In the **Inspector** for the MIDI or instrument track, open the **MIDI Inserts** section.
2. Click an insert slot and select **Chorder** from the **Effect Type** pop-up menu.

   The **Chorder** effect is activated, and its control panel opens.
3. On the chord track, select the chord events and drag them to the **Chorder** control panel.

   The drop position determines the velocity area and the position of the first chord event. All subsequent chord events are mapped chromatically. Chord events with more than one occurrence are only assigned once.

   To remap the chords, hold down [Alt]/[Option] and drag again.
4. On your MIDI keyboard, hit the corresponding keys to play back the chords.

Assigning Chord Events to HALion Sonic SE Pads

PREREQUISITE

Create a chord progression on the chord track and add an instrument track with HALion Sonic SE as VST instrument to your project.

PROCEDURE

1. On the chord track, select the chord events and drag them to the HALion Sonic SE pads.

   The first chord event is mapped to the pad where you dropped it, and all subsequent chord events are mapped to the following pads.
2. Click the corresponding pads on the HALion Sonic SE keyboard to trigger the chords.

Controlling MIDI or Audio Playback using the Chord Track

You can use the chord track to control audio playback or MIDI playback.

Using Live Transform

Live Transform allows you to transpose the MIDI input live to a chord progression on the chord track. This way, you do not have to worry about what key you hit on your MIDI keyboard as the MIDI input is transposed to match chords or scales on your chord track in realtime.

PROCEDURE

1. Create a MIDI or an instrument track and activate **Record Enable**.
2. In the **Inspector**, open the **Chords** section.
3. Open the **Live Transform** pop-up menu and do one of the following:
   - To map the MIDI input to chord events, select **Chords**.
   - To map the MIDI input to scale events, select **Scales**.
4. Hit some keys on your MIDI keyboard or on the **Virtual Keyboard**.

RESULT

Any key that you hit is mapped in realtime to the chord or scale events on the chord track.

Using Follow Chord Track

This allows you to match an existing recording to a chord progression on the chord track.

PROCEDURE

1. Select the track that you want to match to the chord track.
2. In the **Inspector**, click **Chords**.
3. Open the **Follow Chord Track** pop-up menu and select a mode.

   NOTE

   If this is the first time that you open this pop-up menu for the track, the **Follow Chord Track** dialog opens.

4. In the **Follow Chord Track** dialog, make your settings.
5. Click **OK**.

RESULT

The events on your track now match the chord progression on the chord track.

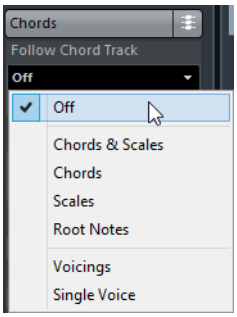
NOTE

If you matched your MIDI track to the chord track, some of the original MIDI notes may be muted. To hide these notes in the editors, select **File > Preferences > Editing > Chords** and activate **Hide muted Notes in Editors**.

RELATED LINKS
Follow Chord Track Dialog on page 907
Follow Chord Track Modes on page 906

Follow Chord Track Modes

This section of the **Inspector** allows you to determine how your track follows the chord track.



The following options are available on the **Follow Chord Track** pop-up menu:

Off

Follow Chord Track is deactivated.

Chords & Scales

This maintains the intervals of the original chord or scale as far as possible.

Chords

This transposes MIDI notes to match the key note and maps them to the current chord.

Scales

This transposes MIDI notes to match the current scale. This allows a bigger variety of notes and a more natural performance.

Root Notes

This transposes MIDI notes to match the root note of the chord event. The effect corresponds to using the transpose track. This option is suitable for bass tracks.

Voicings

This transposes MIDI notes to match the voices of the selected voicing library.

Single Voice

Maps MIDI notes and VariAudio segments to the notes of a single voice (soprano, tenor, bass, etc.) of the voicing. Use the pop-up menu below to select the desired voice.

NOTE

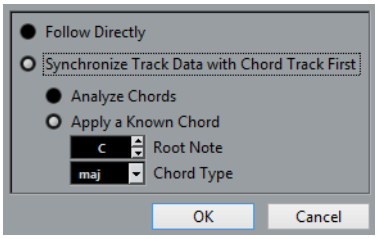
If you apply this mode to a selection of tracks that contain separate voices, you can set up one track as master and the others as voicing slaves. This way, you can change the voicing of the master, and the slaves will follow automatically.

RELATED LINKS

Assigning Voices to Notes on page 908

Follow Chord Track Dialog

This dialog opens the first time that you select an option on from the **Follow Chord Track** pop-up menu on the **Chords** section of the **Inspector**.



Follow Directly

Activate this if your VariAudio segments or MIDI notes are already in accordance with the chord track. This is the case if you extracted your chords from the MIDI events on the track by selecting **Project > Chord Track > Create Chord Symbols**, for example.

Synchronize Track Data with Chord Track First

Activate **Analyze Chords** if the track data has nothing in common with the chord events. This analyzes the MIDI events and matches the found chords to the chord track. This is only available for MIDI.

Activate **Apply a Known Chord** if the track data has nothing in common with the chord events and if there are no chord changes. Specify **Root Note** and **Chord Type** of your events.

Using Map to Chord Track

This allows you to match individual parts or events to a chord progression on the chord track.

PROCEDURE

1. In the **Project** window, select the events or parts that you want to map to the chord track.
2. Select **Project > Chord Track > Map to Chord Track**.

   The **Map to Chord Track** dialog opens.
3. From the **Mapping Mode** pop-up menu, select a mapping mode.

   NOTE

   If you select **Voicings** and no voices are found, **Auto** mode is used instead.
4. Click **OK**.

RESULT

The chords and scales of each event or part are analyzed and used for mapping. If no chords are found, Nuendo assumes that the performance is in “C”. The available mapping modes and voicings correspond to the **Follow Chord Track** parameters in the **Chords** section of the **Inspector**.

RELATED LINKS

Follow Chord Track Modes on page 906

Assigning Voices to Notes

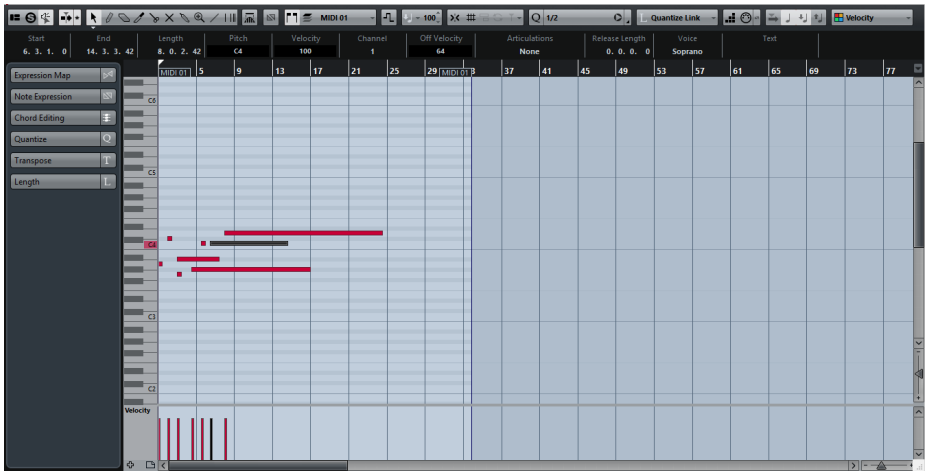
You can transpose MIDI notes to match the voices of a selected voicing library.

PROCEDURE

- Select **Project > Chord Track > Assign Voices to Notes**.

RESULT

The note pitches now match the voicing of the chord track and you can still edit the MIDI notes. If you now select a note in the **Key Editor**, you see that **Voice** in the info line is assigned.



Extracting Chord Events from MIDI

You can extract chords from MIDI notes, parts, or tracks. This is useful, if you have a MIDI file and want to show its harmonic structure, and use this file as starting point for further experimenting.

Prerequisite

Add the chord track and create MIDI notes that can be interpreted as chords. Drums, monophonic bass, or lead tracks are not suitable.

Procedure

1. In the **Project** window, select a part or one or several MIDI tracks.

   You can also select the MIDI tracks, parts, or notes that you want to extract in the **Key Editor**, **Score Editor**, or **In-Place Editor**.

2. Select **Project > Chord Track > Create Chord Symbols**.

   The **Create Chord Symbols** dialog opens.

3. Make your settings and click **OK**.

Result

The chord events are added on the chord track.

Note

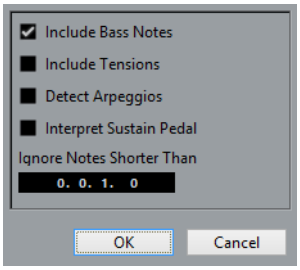
You can now open the **Chord Assistant** to create variations.

Related links

Create Chord Symbols Dialog on page 910

Create Chord Symbols Dialog

This dialog allows you to determine, which MIDI data should be taken into account when extracting chord events from MIDI.



Include Bass Notes

Activate this, if you want your chord events to contain a bass note.

Include Tensions

Activate this, if you want your chord events to contain tensions.

Detect Arpeggios

Activate this, if you want your chord events to contain arpeggiated chords, that is, chords whose notes are played one after another instead of all at once.

Interpret Sustain Pedal

Activate this, if you want your chord events to contain sustain pedal chords, that is, notes that are played while the sustain pedal is held.

Ignore Notes Shorter Than

Allows you to determine the minimum length of the MIDI events that are taken into account.

Recording Chord Events with a MIDI Keyboard

You can use a MIDI keyboard to record chord events on the chord track.

PREREQUISITE

Your project contains an instrument track with **Record Enable** or **Monitor** activated.

PROCEDURE

1. On the chord track, activate **Record Enable**.
2. On the **Transport Panel**, activate **Record**.
3. Play some chords on your MIDI keyboard.

RESULT

All recognized chords are recorded as chord events on the chord track.

NOTE

The chord track uses its own voicing settings. The recorded chord events may therefore sound different.

RELATED LINKS

Creating Events from Chord Pads on page 934

Chord Pads (NEK only)

Chord pads allow you to play with chords, and to change their voicings and tensions. In terms of harmonies and rhythms, they allow for a more playful and spontaneous approach to composition than the chord track functions.

You can:

- Perform with chords in realtime via a MIDI keyboard.
- Record your performance as MIDI events on a MIDI or instrument track or even on the chord track.

NOTE

We assume that you have a MIDI keyboard connected and set up.

RELATED LINKS

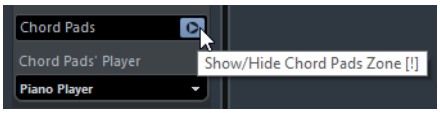
Voicings on page 900

Chord Pads Zone

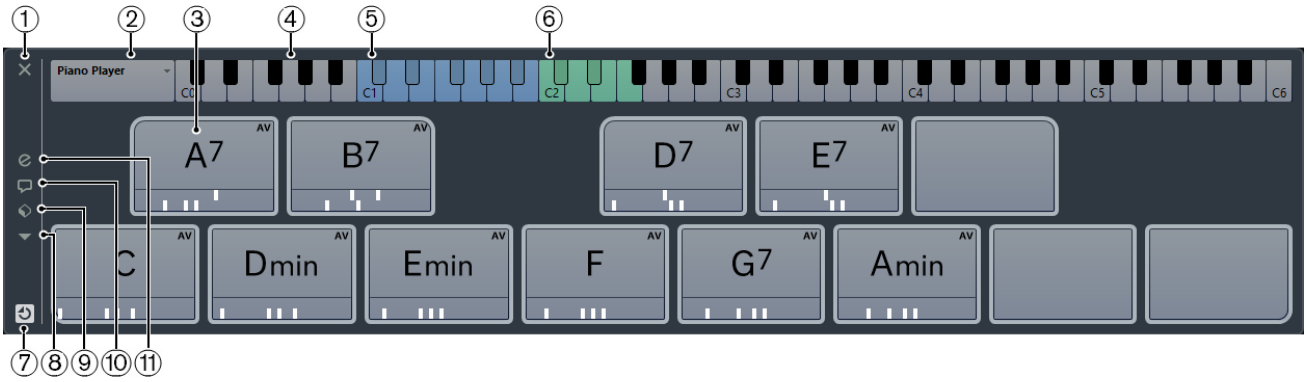
The chord pads zone at the bottom of the **Project** window holds all functions that you need to work with chord pads.

To open the chord pads zone do one of the following:

- Select **Project > Chord Pads**.
- Select a MIDI or instrument track, and in the Inspector, open the **Chords** section and activate **Show/Hide Chord Pads Zone**.



The chord pads zone holds the following controls:



1) **Close Chord Pads Zone**

Closes the chord pads zone.

2) **Current Player**

Shows the current player and opens a menu where you can select another player.

3) **Chord Pad**

Each chord pad can contain a chord symbol. To change it, click the **Open Editor** control on the left edge of the chord pad.

4) **Keyboard**

Shows which keys are played when you trigger a chord pad. To zoom the keyboard, click a key and drag up or down. To scroll the keyboard, click and drag to the left or to the right.

5) **Trigger Keys**

The keys highlighted in blue on the keyboard correspond to the keys on your MIDI keyboard that trigger the chord pads. You can define the trigger keys on the **Remote Control** page of the chord pad **Settings**.

6) **Remote Range for Voicings/Tensions/Transpose**

The keys highlighted in green on the keyboard display correspond to the keys on your MIDI keyboard that change the voicings, tensions, and transpose settings of the pads. You can define these remote keys on the **Remote Control** page of the chord pad **Settings**.

7) **Activate/Deactivate Remote Control for Chord Pads**

Allows you to activate/deactivate the chord pads zone. If you deactivate remote control for chord pads, your MIDI keyboard no longer triggers the pads.

8) **Functions Menu**

Opens a menu with specific functions and settings for the chord pads.

9) **Chord Pads Presets**

Allows you to save and load presets for chord pads and players.

10) **Show/Hide Chord Assistant** (NEK only)
Shows/Hides the **Chord Assistant** that shows suggestions of chords that match the chord that you specified as the origin chord.

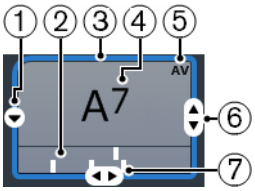
11) **Show/Hide Settings**
Shows/Hides the chord settings, where you can configure different players, the pad layout, and the remote assignment.

RELATED LINKS
Chord Pad Settings – Remote Control on page 926
Players and Voicings on page 930

Chord Pad Controls

The chord pad controls allow you to edit the chord pads.

- To show the chord pad controls, move the mouse over a chord pad.



1) **Open Editor**
Opens the chord **Editor** that allows you to select a chord for the chord pad.

2) **Voicing Indicators**
Shows the voicing used for the chord. Voicing indicators can only be displayed, if the horizontal zoom level for the chord pads is high enough.

3) **Adaptive Voicing Reference/Use X as Origin for Chord Assistant** (NEK only)
When the active chord pad is set as adaptive voicing reference, its borders are shown in yellow. All other chord pads will follow its voicing and are set in a way that they do not get to far away from the reference.

If the chord pad is set as origin for the **Chord Assistant**, its borders are shown in blue. This chord pad is used as a basis for the suggestions in the **Chord Assistant** window.

4) **Assigned Chord**
Shows the chord symbol that is assigned to the chord pad. Each chord pad can contain one chord symbol. If the name of the assigned chord is too long to display it on the chord pad, it is underlined, and the full chord name is shown in a tooltip.

5) **AV (Adaptive Voicing)/L (Lock)**

By default, all chord pads follow the adaptive voicing. This is indicated by an AV symbol. If you change the voicing for a pad manually however, **Adaptive Voicing** is deactivated.

An L symbol indicates that the chord pad is locked for editing.

6) **Voicing**

Allows you to set another voicing for the chord pad.

7) **Tensions**

Allows you to add/remove tensions for the chord.

Chord Pad Context Menu

- **Use X as Origin for Chord Assistant** (NEK only)

  Sets the chord of the current pad as an origin chord for the **Chord Assistant**.

- **Assign Pad from MIDI Input**

  Allows you to assign a chord by pressing keys on your MIDI keyboard.

- **Lock**

  Allows you to lock a chord pad for editing.

- **Adaptive Voicing**

  Sets the current pad as adaptive voicing reference. If set, the automatic voicings for the following pads will be set in a way that they do not get too far away from the reference voicing. Only one pad can be set as adaptive voicing reference.

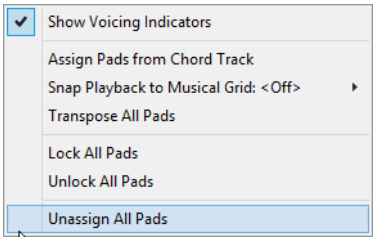
- **Adaptive Voicings Reference**

  Resets the adaptive voicing reference.

- **Unassign Pad**

  Removes the chord assignment from the current pad.

Functions Menu



- **Show Voicing Indicators**

  Allows you to activate/deactivate the voicing indicators that can be displayed at the bottom of each chord pad.

- **Assign Pads from Chord Track**

  Assigns the chord events from the chord track to the chord pads in the same order as they appear on the chord track. Chord events that have more than one occurrence are only assigned once.

- **Snap Playback to Musical Grid**

  Allows you to delay the playback of a triggered chord pad to the next defined musical position. This is useful, if you work with an arpeggiator or with the Pattern Player.

- **Transpose All Pads**

  Transposes all chord pads by a defined transpose value.

- **Lock All Pads**

  Locks all chord pads for editing.

- **Unlock All Pads**

  Unlocks all chord pads.

- **Unassign All Pads**

  Removes the chord assignment from all pads.

Preparations

Before you can start working with the chord pads, you must add a MIDI or an instrument track with an instrument loaded, and open the chord pads zone.

PREREQUISITE

You have installed and set up a MIDI keyboard.

PROCEDURE

1. Select **Project > Add Track > Instrument**.
2. In the **Add Instrument Track** dialog, select an instrument, and click **Add Track**.

   An instrument track with the selected instrument loaded is added to your project, and select a sound that is suited for chords.
3. On the instrument track, click **Record Enable**.
4. Select **Project > Chord Pads** to open the **Chord Pads Zone** at the bottom of the **Project** window.

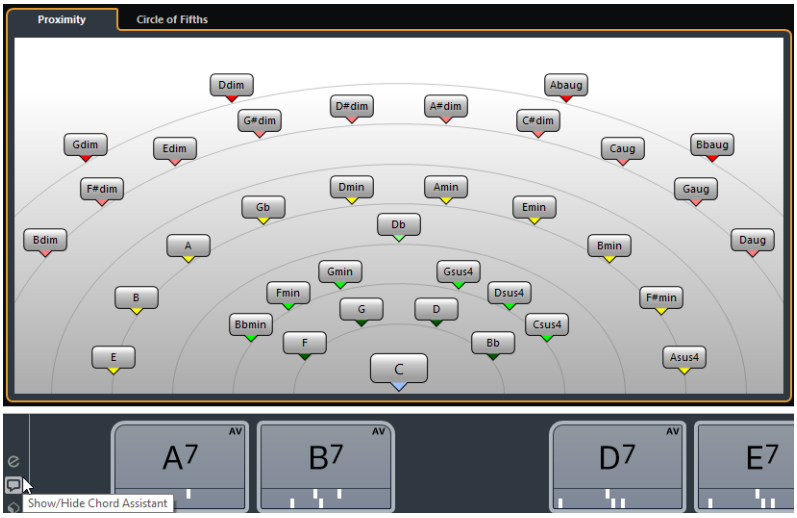
RESULT

You can now click the chord pads or press some of the assigned keys on your MIDI keyboard to trigger the preassigned chords.

Chord Assistant (NEK only)

The **Chord Assistant** allows you to use a chord as a starting point for suggestions for the next chord. It assists you in finding the right chords for creating a chord progression for your song.

- Click **Show/Hide Chord Assistant** on the left side of the chord pads area to open the **Chord Assistant**.



The **Chord Assistant** has two modes:

- **Chord Assistant** – Proximity
- **Chord Assistant** – Circle of Fifths

You must define an origin chord as follows:

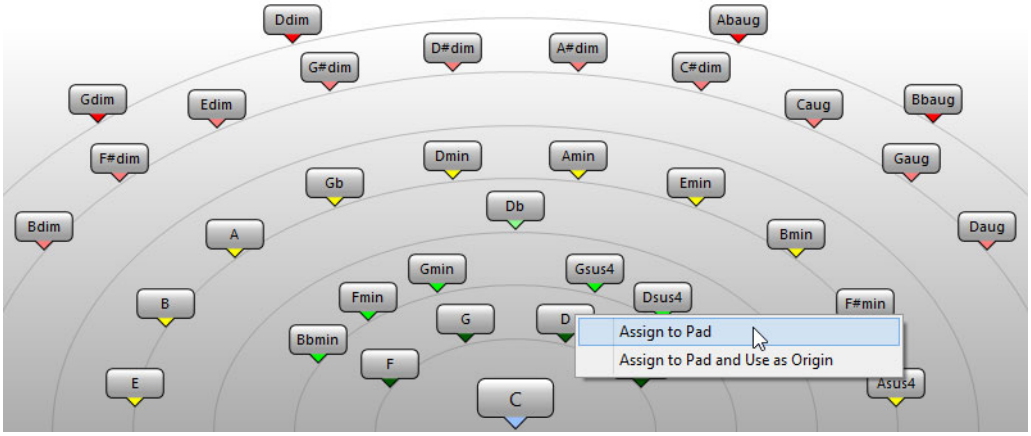
- Right-click the chord pad with the chord you want to use as origin and select **Use X as Origin for Chord Assistant**.

The **Chord Assistant** shows suggestions for follow-on chords that you can assign to the chord pads.

Chord Assistant – Proximity Mode

The **Proximity** mode of the **Chord Assistant** uses a set of harmonic rules to offer suggestions that match the origin chord.

The origin chord in the bottom center of the **Chord Assistant** marks the tonal center. The farther away a chord suggestion is situated from this chord, the more complex the suggestion. The suggested chords are triads or 4-note chords.



- To play a suggested chord, click it.

  The last three suggested chords that you clicked are shown with a highlighted frame.

- To assign a suggestion to the next unassigned chord pad, right-click the suggested chord and select **Assign to Pad**.

  You can also drag the suggested chord and drop it on a chord pad.

- To assign a suggestion to the next unassigned chord pad and use this chord as origin for further suggestions, right-click the suggested chord and select **Assign to Pad and Use as Origin**.

NOTE

The **Proximity** mode is a different representation of the list in the **Chord Assistant**for the chord track.

RELATED LINKS

Chord Assistant – List on page 894

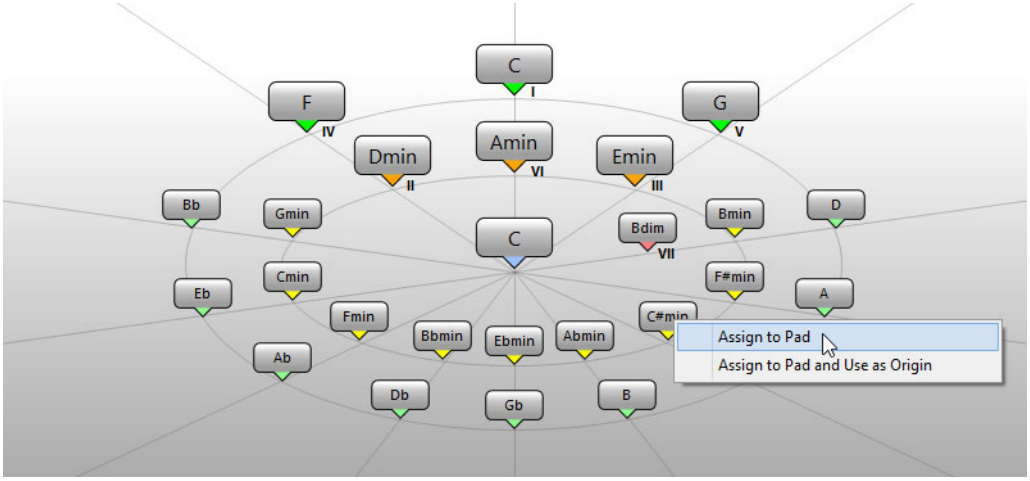
Chord Assistant – Circle of Fifths Mode

The **Circle of Fifths** mode of the **Chord Assistant** shows the chords in an interactive visualization of the circle of fifths.

The origin chord that defines the current key is shown in the center of the **Chord Assistant**. The tonic (I) of that key is displayed above the center. The outer circle shows the twelve major chords ordered in intervals of fifths.

The inner circle displays the corresponding parallel minor chords.

The roman numerals mark the chords of the current key with their scale degree. You can use these chords to create typical chord progressions. However, you can also use the other chords for more creative results.



- To play a chord, click it.

  The last three chords that you clicked are shown with a highlighted frame.

- To assign a chord to the next unassigned chord pad, right-click the suggested chord and select **Assign to Pad**.

  You can also drag the suggested chord and drop it on a chord pad.

- To assign a suggestion to the next unassigned chord pad and use this chord as origin, right-click the chord and select **Assign to Pad and Use as Origin**.

NOTE

The **Circle of Fifths** is also available in the **Chord Assistant** for the chord track.

RELATED LINKS

Chord Assistant – List on page 894

Assigning Chords to Chord Pads

Some chords are preassigned to the chord pads. But you can also assign your own chords.

To assign chords to chord pads, you can use:

- The chord **Editor**
- The **Chord Assistant** – Proximity (NEK only)
- The **Chord Assistant** – Circle of Fifths (NEK only)
- Your MIDI keyboard
- The chord events from the chord track

You can overwrite the preassigned chords, or clear all chord pads first to start from scratch. Proceed as follows:

- To the left of the chord pads zone, open the **Functions Menu** and select **Unassign All Pads**.

Assigning Chords with the Chord Editor

If you know exactly which chord you want to assign to a specific chord pad, you can use the chord **Editor**.

PROCEDURE

1. Move the mouse pointer to the left edge of the chord pad, and click **Open Editor**.
2. In the chord **Editor**, use the chord definition buttons to define a root note, a chord type, a tension, and a bass note.

   The new chord is triggered automatically to give an acoustic feedback.

RELATED LINKS

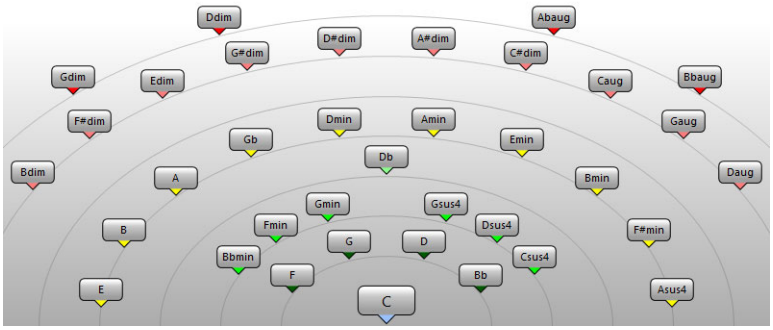
Chord Editor on page 892

Assigning Chords with the Chord Assistant – Proximity Mode (NEK only)

If you have a chord that you want to use as a starting point to find follow-on chords, you can use the **Chord Assistant** – **Proximity** mode.

PROCEDURE

1. Right-click the chord pad that you want to use as a starting point and activate **Use x as Origin for Chord Assistant**.



   The **Chord Assistant** opens, and the borders of the chord pad change their color to indicate that the assigned chord is now used as origin.

2. In the **Chord Assistant**, click the chord symbols to trigger corresponding chords.

   The farther away the chord is from the origin chord that is regarded as the tonal center, the more complex the suggestion becomes.

3. To assign a chord, drag it from the **Chord Assistant** and drop it on a chord pad.

   NOTE

   If one of the next chord pads is free, you can also right-click the chord in the **Chord Assistant** and select **Assign to Pad**. This assigns the chord to the next free pad.

RELATED LINKS

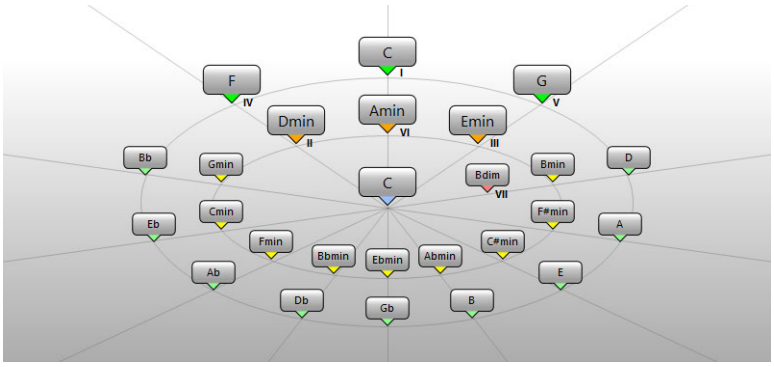
Chord Assistant – List on page 894

Assigning Chords with the Chord Assistant – Circle of Fifths Mode (NEK only)

If you have a chord that you want to use as a starting point for a chord progression, but you do not know how to create such a progression, you can use the **Chord Assistant** – Circle of Fifths.

PROCEDURE

1. Right-click the chord pad that you want to use as a starting point and activate **Use x as Origin for Chord Assistant**.



   The **Chord Assistant** opens, and the borders of the chord pad change their color to indicate that the assigned chord is now used as origin.

2. Click **5th** to switch to the circle of fifths mode.

   The origin chord is displayed in the center, and the chords that belong to the scale are shown above it. The numerals indicate the scale degree of the chords. These help you to create chord progressions.

3. In the **Chord Assistant**, click the chord symbols to trigger the corresponding chords.

4. To assign a chord, drag it from the **Chord Assistant** and drop it on the chord pad.

   NOTE

   If one of the next chord pads is free, you can also right-click the chord in the **Chord Assistant** and select **Assign to Pad**. This assigns the chord to the next free pad.

Assigning Chords with the MIDI Keyboard

If you know which chord you want to assign to a specific chord pad, you can use a MIDI keyboard.

PREREQUISITE

You have selected a MIDI track or an instrument track.

PROCEDURE

1. Right-click the chord pad that you want to use for the new chord, and select **Assign Pad from MIDI Input**.

   The borders of the chord pad change their color to indicate that it is now ready for recording.

2. On your MIDI keyboard, press the keys for the chord that you want to assign.

   The chord and its voicing is assigned to the chord pad, and you hear an acoustic feedback of the chord.

   NOTE

   The assigned voicing can be changed by the **Adaptive Voicing** setting. Therefore, if you want to keep the voicing for that specific pad, right-click the chord pad and select **Lock** from the context menu.

RELATED LINKS

Adaptive Voicing on page 930

Assigning Chords from the Chord Track

You can assign the chord events from the chord track to the chord pads.

PROCEDURE

- To the left of the chord pads zone click the **Functions Menu** button, and select **Assign Pads from Chord Track**.

  If chords are already assigned to the chord pads, a warning message informs you that all previous assignments will be overwritten.

RESULT

The chord events are assigned to the chord pads in the same order as they appear on the chord track.

NOTE

Chord events that have more than one occurrence on the chord track are only assigned once.

Moving and Copying Chord Pads

You can swap the chord assignments between 2 pads or copy a specific chord and its settings from one pad to another.

- To swap the chord pad assignment between 2 pads, click a chord pad and drag it to another chord pad.

  While you drag, the border of the destination chord pad changes its color. When you drop the pad on another, the chord assignments are swapped.

- To copy the chord assignment of one chord pad to another pad, [Alt]/[Option]-click a chord pad and drag it to another chord pad.

  While you drag, the border of the destination chord pad changes its color. When you drop the pad on another, the first pad's assignment is copied to the destination chord pad.

NOTE

When you move or copy chord pads, the chord is moved or copied, and all its settings are, except for the **Adaptive Voicings Reference**.

Playing Back and Recording Chords

Playing Back Chord Pads with your MIDI Keyboard

PREREQUISITE

You have connected and set up a MIDI keyboard.

PROCEDURE

1. Select **Project > Add Track > Instrument**.
2. In the **Add Instrument Track** dialog, select a VST instrument.
3. Click **Add Track**.

   An instrument track with the selected VST instrument is added to your project.
4. On the instrument track, click **Record Enable**.
5. Select **Project > Chord Pads** to open the **Chord Pads Zone** at the bottom of the **Project** window.
6. Press some keys on your MIDI keyboard to trigger the chords that are preassigned to the chord pads.

RELATED LINKS

Chord Pad Settings – Remote Control on page 926
Changing the Pads Remote Range on page 929

Recording Chords on MIDI or Instrument Tracks

You can record the chords that are triggered through the chord pads on MIDI or instrument tracks. This way, you can play back and edit your performance at any time.

PREREQUISITE

You have connected and set up a MIDI keyboard, you have opened and set up the chord pads zone, and you have added an instrument or a MIDI track for which a VST instrument is loaded to your project.

PROCEDURE

1. On the instrument track, click **Record Enable**.
2. On the **Transport** panel, activate **Record**.
3. On your MIDI keyboard, press the keys that trigger the chord pads.

   NOTE

   Use the keys that are not assigned to play and record other chords.

RESULT

The triggered chords are recorded on the track. The note events are automatically assigned to different MIDI channels according to their pitches. Note events that correspond to the soprano voice are assigned to MIDI channel 1, alto is assigned to MIDI channel 2, and so on.

AFTER COMPLETING THIS TASK

You can now open the **Key Editor** and fine-tune your recorded MIDI parts using the chord editing functions, for example. You can also use **MIDI > Dissolve Part** to dissolve the recorded chords by pitches/channels.

Recording Chords on the Chord Track

You can record the triggered chords on the chord track. This way, you can easily create chord events for a lead sheet, for example.

PREREQUISITE

You have connected and set up a MIDI keyboard, you have opened and set up the chord pads zone, and you have added an instrument or a MIDI track for which a VST instrument is loaded.

PROCEDURE

1. On the instrument track, enable **Monitor**.
2. Select **Project > Add Track > Chord** to add the chord track.
3. In the Inspector for the chord track, click **Record Enable**.
4. On the **Transport** panel, activate **Record**.

5. On your MIDI keyboard, press the keys that trigger the chord pads.

NOTE

Use the keys that are not assigned to play and record other chords.

RESULT

The chord events are recorded on the chord track.

NOTE

The recorded chord events may sound different from the chord pad playback. This is because the voicing settings for the chord track differ from the chord pad voicings.

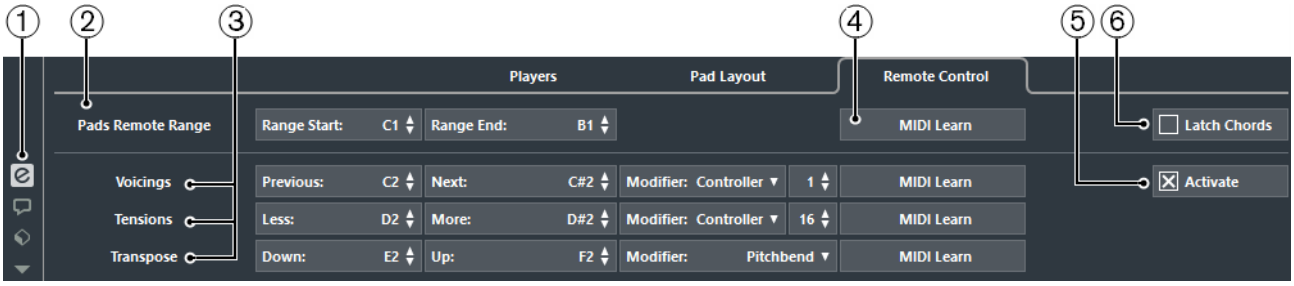
RELATED LINKS

Chord Functions (NEK only) on page 890
Voicings on page 900

Chord Pad Settings – Remote Control

On the **Remote Control** tab in the chord pad **Settings**, you can change the default remote control assignments.

- To the left of the chord pads zone, click **Show/Hide Settings** and activate the **Remote Control** tab.



1) **Show/Hide Settings**

Opens the settings for the chord pads.

2) **Pads Remote Range**

Allows you to set the start and end note for the remote range.

3) **Voicings/Tension/Transpose**

Allows you to assign remote keys for changing the voicings, tension, and transposition settings of the last played chord pad. You can also assign continuous controllers to change all chord pads simultaneously.

4) **MIDI Learn**

Activates/Deactivates the **MIDI Learn** function to assign MIDI input to the **Pads Remote Range** and to the parameters **Voicings**, **Tensions**, and **Transpose**.

5) **Activate**

Activates/Deactivates the remote key assignment for the parameters **Voicings**, **Tensions**, and **Transpose**. If this is deactivated, only the remote key assignment for the **Pads Remote Range** is active.

6) **Latch Chords**

Activate this if you want the chord pad to play back until it is triggered again.

NOTE

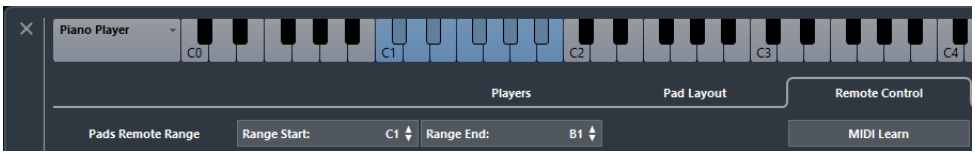
If you use MIDI controllers that are already assigned to other remote control features, for example, the Track Quick Controls or the VST Quick Controls, all previous assignments are lost.

RELATED LINKS

Pads Remote Range on page 927

Pads Remote Range

The **Pads Remote Range** is the range of remote keys that trigger the chords that are assigned to the chord pads.



By default, the **Range Start** is set to C1 and the **Range End** to B1. This is indicated by the corresponding keys on the keyboard in the chord pads zone being highlighted. You can trigger the chords that are assigned to the chord pads by hitting the keys that correspond to this note range on your MIDI keyboard.

Default Remote Assignment

By default, the MIDI events C1 to B1 trigger the chords that are assigned to the chord pads. All keys that are not assigned for remote control, by default G#2 and further, can be used for regular playback.

You can change the voicing, tension or transposition of the triggered chord by enabling **Activate** in the lower part of the **Remote Control** tab and using the following default remote notes:

Action	Description	Remote Note
Voicings: Previous	Plays back the previous voicing of the last played chord.	C2
Voicings: Next	Plays back the next voicing of the last played chord.	C#2
Voicings for all chord pads	The wheel position determines the voicings for the next played chords of all chord pads.	CC#1 Modulation wheel
Tensions: Fewer	Plays back the last played chord with fewer tensions.	D2
Tensions: More	Plays back the last played chord with more tensions.	D#2
Tensions for all chord pads	Allows you to determine the tension level for the next played chord of all chord pads.	CC#16
Transpose: Down	Plays back the last played chord and transposes it downwards.	E2
Transpose: Up	Plays back the last played chord and transposes it upwards.	F2
Transpose all chord pads	The wheel position determines the transposition value for the next played chords of all chord pads. Moving the wheel all the way up or all the way down corresponds to +/-5 semitones.	Pitchbend wheel

Remote Assignments are saved globally.

NOTE

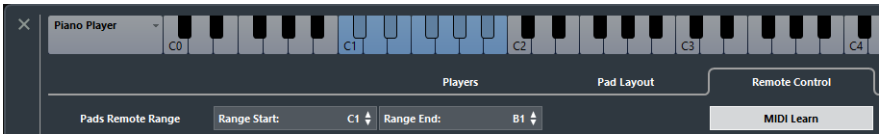
If you use the remote keys for voicings, tensions, or transposition after releasing the remote key for the chord pad, the next played chord is affected.

Changing the Pads Remote Range

You can widen the pads remote range to access more chord pads. If you want to use a wider key range on your MIDI keyboard for regular playing, you can narrow the pads remote range.

PROCEDURE

1. Select **Show/Hide Settings > Remote Control** to open the remote control assignments.



2. Do one of the following:
   - Click **MIDI Learn** so that the button lights up, and on your MIDI keyboard, press the two keys that you want to assign as range start and range end.
   - Enter a new value in the **Range Start** and **Range End** fields.

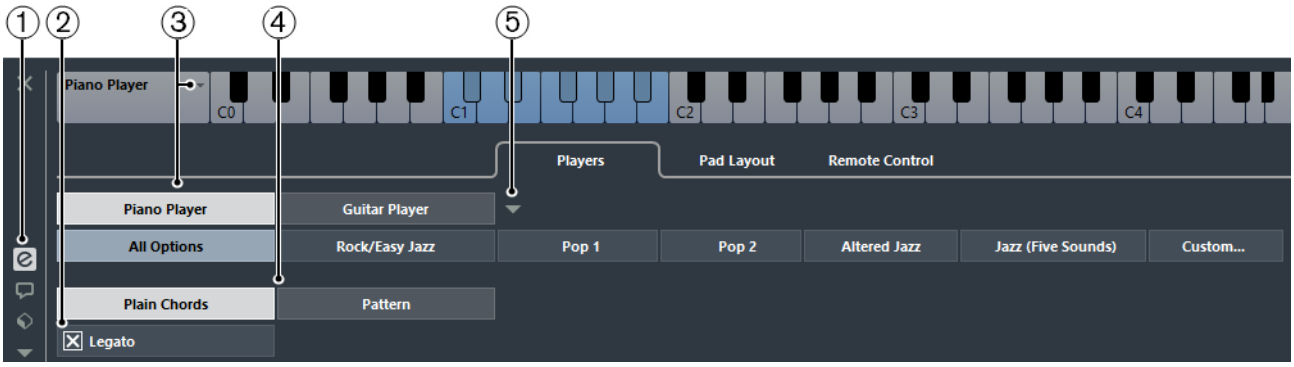
RESULT

On the keyboard, the indication for pads remote range is changed.

Chord Pad Settings – Players

On the **Players** tab in the chord pad **Settings** you can change the voicing that is used for the chord pads. You can select different players with specific voicing settings that are typical for that kind of player. By default, the **Piano Player** option is active.

- To the left of the chord pads zone, click **Show/Hide Settings** and activate the **Players** tab.



1) **Show/Hide Settings**
   Opens the settings for the chord pads.

2) **Legato**

If this is activated, the common notes of two subsequent chords are connected.

3) **Player Selection**

Selects the player, and uses its voicing for the chord pads.

4) **Plain Chords/Pattern**

Select **Plain Chords** to trigger all notes of a chord simultaneously, or select **Pattern** to break up the chords into their individual notes.

In **Plain Chords** mode, you can activate **Legato** to hold the common notes of two subsequent chords instead of triggering them again.

5) **Add Player**

Opens a menu where you can select the player that you want to add. From here, you can also rename or remove the current player.

RELATED LINKS

Players and Voicings on page 930
Voicings on page 900

Players and Voicings

Different types of instruments and styles have different voicing libraries. These determine how the chords are played back, and which pitches are played. In the chord pads zone, these voicings are referred to as players.

RELATED LINKS

Voicings on page 900

Adaptive Voicing

In Nuendo, the **Adaptive Voicing** setting ensures that pitches in chord progressions do not change abruptly.

By default, **Adaptive Voicing** is activated and the voicings of the chord pads are determined automatically according to specific voice leading rules.

If you want to set the voicing of a specific chord pad manually, and do not to want it changed automatically, you can use the **Voicing** control to the right of a chord pad. When you assign your own voicing, **Adaptive Voicing** is deactivated for that chord pad, so that the pad does no longer follow the voice leading rules of the voicing reference. To activate **Adaptive Voicing** again, right-click the chord pad and activate **Adaptive Voicing**.

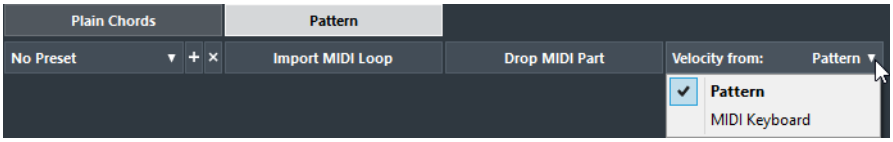
To lock the voicing for a chord pad, you can right-click the pad and activate **Lock**. This locks this pad for editing and remote control changes, and deactivates **Adaptive Voicing**. To unlock the chord pad again, right-click the pad and deactivate **Lock**.

Using the Pattern Player

You can determine how the triggered chord is played: as a plain chord, or according to a selected pattern. The pattern player plays the notes that make up the chord one after another (arpeggio).

PROCEDURE

1. Select **Show/Hide Settings > Players > Pattern**.



2. Perform one of the following actions:
   - Click **Import MIDI Loop** to select a MIDI loop that you want to use as a pattern.
   - Drag a MIDI part from the event display to the **Drop MIDI Part field**.

   NOTE

   The loop or part must have between 3 and 5 voices. In the **MediaBay**, the number of voices is indicated in the **Voices** column of the result list.

   The loop or part is taken as a reference and defines how the chord is played. The **Drop MIDI Part** field displays the name of the selected loop or part.

3. In the **Velocity from:** field, select a velocity source for the notes.
   - Activate **MIDI Keyboard** to determine the velocity values by pressing the keys on your MIDI keyboard harder or softer.
   - Activate **Pattern** to use the velocity values from the MIDI loop or the MIDI part that is selected as a pattern.

AFTER COMPLETING THIS TASK

If you have a pattern that you want to use in other projects, you can save it using the presets section in the pattern player.

RELATED LINKS

Assigning Voices to Notes on page 908
Setting Up the Results List Columns on page 605

Using Different Players on Multiple Tracks

You can set up different players with different sounds on different tracks. If you record-enable these tracks and play the chord pads, each track uses a dedicated player.

PROCEDURE

1. Select **Project > Add Track > Instrument**.
2. In the **Add Instrument Track** dialog, enter the number of tracks in the **Count** field, and select a VST instrument.
3. Click **Add Track**.

   The instrument tracks are added to your project.
4. Select **Project > Chord Pads** to open the chord pads zone.
5. To the left of the chord pads zone, activate **Show/Hide Settings** and click **Players**.

6. Select the first instrument track, select a sound on the VST instrument, and in the chord pads zone, select a player.

   For example, select a piano sound and assign a **Piano Player**.

   NOTE

   When setting up the player for a track, make sure that Record Enable or Monitor is only active for this particular track.
7. Select the second instrument track, select a sound on the VST instrument, and set up another player.

   For example, select a guitar sound and assign a **Guitar Player**.
8. Select the next instrument track, and proceed as for the other 2 tracks.

   For example, select a string sound and assign a **Basic Player**.
9. Select all instrument tracks, and click **Record Enable**.

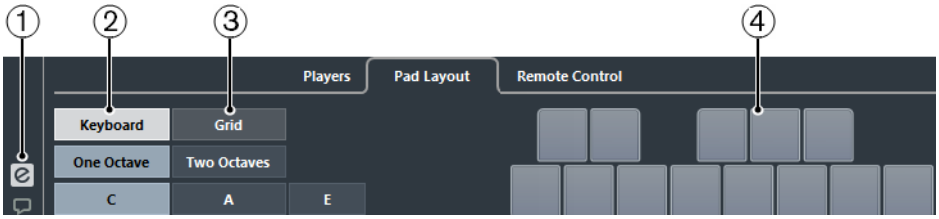
RESULT

You can now play the chord pads and use the remote control parameters for **Tensions** and **Transpose** to change all chord symbols for each player simultaneously. However, if you change the **Voicing**, only the selected player is affected.

Chord Pad Settings – Pad Layout

The **Pad Layout** tab in the chord pad **Settings** allows you to change the layout that is used for the chord pads. By default, the keyboard layout is active, but you can change to a grid layout, if you prefer that. After changing the pad layout you may need to adjust the remote setup.

- To the left of the chord pads zone, click **Show/Hide Settings** and activate the **Pad Layout** tab.



1) **Show/Hide Settings**
   Opens the settings for the chord pads.

2) **Keyboard**
   Activate this to show the chord pads in a keyboard layout. You can display one or two octaves, and you can select if the first chord pad starts with C, A or E.

3) **Grid**
   Activate this to show the chord pads in a grid layout. You can display up to 4 rows and 16 columns.

4) **Layout display**
   Shows how the active chord pad layout is displayed.

Chord Pads Presets

Chord pads presets are templates that can be applied to newly created or to existing chord pads.

Chord pads presets contain the chords that are assigned to the chord pads, as well as the player configurations including any pattern data that you have imported via the **MediaBay** or by using drag & drop. The chord pads presets allow you to quickly load chords, or reuse player settings. The **Chord Pads Presets** menu is located to the left of the chord pads zone. Chord pads presets are organized in the **MediaBay**, and you can categorize them with attributes.

- To save/load a chord pads preset, select **Chord Pads Presets > Save/Load Chord Pads Preset**.

You can also load only the assigned chords from a chord pads preset, without loading the player configurations. This is useful if you want to use specific chords that you have saved as a preset, but do not want to alter your current player setting.

- To load only the chords of a chord pads preset, select **Chord Pads Presets > Load Chords from Preset**.

In the same way, you can also load only the player configurations of a chord pads preset. This is useful if you have saved very complex player settings and want to reuse them on other chord pads without changing the currently assigned chords.

- To load only the player settings of a chord pads preset, select **Chord Pads Presets > Load Players from Preset**.

Saving Chord Pads Presets

If you have set up the chord pads, you can save them as chord pads presets.

PROCEDURE

1. To the left of the chord pads zone, select **Chord Pads Preset > Save Chord Pads Preset**.
2. In the **New Preset** section, enter a name for the new preset.

   NOTE

   You can also define attributes for the preset.

3. Click **OK** to save the preset and exit the dialog.

Creating Events from Chord Pads

You can use the chords assigned to the chord pads to create chord events or MIDI parts in the **Project** window.

- To create a chord event, drag a chord pad and drop it on the chord track.
- To create a MIDI part with the length of one bar, drag a chord pad an drop it on a MIDI or instrument track.

RELATED LINKS

Recording Chord Events with a MIDI Keyboard on page 910

The Logical Editor, Transformer, and Input Transformer

Introduction

Most of the time you will perform your MIDI editing graphically in one of the MIDI editors. But there are times when you want more of a “search and replace” function on MIDI data, and that’s where the Logical Editor comes in.

The principle of the Logical Editor is this:

- You set up filter conditions to find certain elements.

  This can be elements of a certain type, with certain attributes or values or on certain positions, in any combination. You can combine any number of filter conditions and make composite conditions using And/Or operators.

- You select the basic function to be performed.

  The options include Transform (changing properties of the found elements), Delete (removing the elements), Insert (adding new elements based on the found positions of other elements) and more.

- You set up a list of actions, which specify exactly what is done.

  This is not necessary for all functions. For example, the Delete function does not require any additional action specifications – it simply removes all found elements. The Transform function on the other hand requires that you specify which properties are changed and in which way (transpose notes by a certain amount, adjust velocity values, etc.).

By combining filter conditions, functions and the specific actions, you can perform very powerful processing.

To master the Logical Editor, you need some knowledge about how MIDI messages are structured. However, the Logical Editor also comes with a rich selection of presets, allowing you to access its processing powers without delving into its more complicated aspects.

IMPORTANT

Studying the included presets is an excellent way to learn the workings of the Logical Editor! Many of them can also be used as starting points when you set up your own editing operations using the Logical Editor.

RELATED LINKS

Working with presets on page 953

About the Transformer MIDI effect

The Transformer effect is a realtime version of the Logical Editor, allowing you to apply editing to the events played back from a track “on the fly”. The Transformer contains virtually the same settings and functions as the Logical Editor – where there are differences between the two, this is clearly stated on the following pages.

RELATED LINKS

MIDI realtime parameters and effects on page 735

About the Input Transformer

This too is very similar to the Logical Editor. Just like the Transformer effect, the Input Transformer works in realtime. However, the Input Transformer filters out and transforms MIDI data as it is recorded. In other words, the settings you make in the Input Transformer will affect the actual MIDI events you record.

We recommend that you make yourself familiar with the Logical Editor first, since they share many features and principles.

RELATED LINKS

The Input Transformer on page 954

About the Project Logical Editor

There is also a “Project Logical Editor” available via the Edit menu.

RELATED LINKS

Project Logical Editor on page 957

Opening the Logical Editor

PROCEDURE

1. Select the desired parts or events.

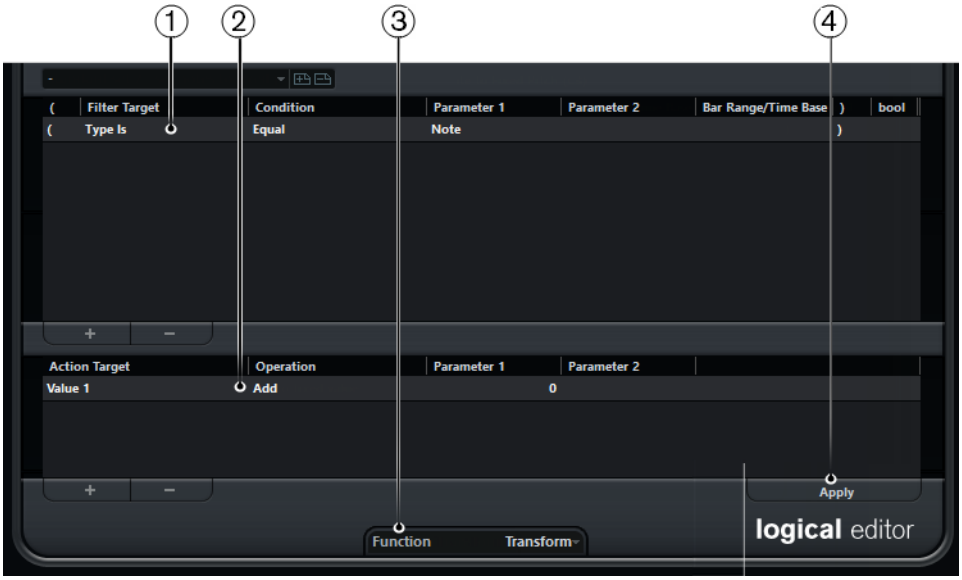
   What will be affected by the operation depends on the current selection.

   - In the Project window, edits using the Logical Editor are applied to all selected parts, affecting all events (of the relevant types) in them.
   - In the MIDI editors, edits using the Logical Editor are applied to all selected events. If no events are selected, all events in the edited part(s) will be affected.

   You can change the selection while the Logical Editor window is open.

2. Select “Logical Editor…” from the MIDI menu.

Window overview



1) Filter conditions list
2) Action list
3) Function pop-up menu
4) Apply button (not available in the Transformer)

Setting up filter conditions

General procedure

The upper list is where you set up the filter conditions, determining which elements to find. The list can contain one or several conditions, each on a separate line.

- To add a new condition, click the “+” button below the list.

  A new line is added at the bottom of the list. If there are many lines, you may need to use the scrollbar to the right to view them.

- To remove a condition, select it and click the “-” button below the list.

NOTE

If you have already defined filter conditions and/or applied a preset, but want to start again from scratch, you can initialize the settings by selecting the Init option from the Presets pop-up menu.

You set up a filter condition line by clicking in the columns and selecting options from the pop-up menus that appear. Here is a brief description of the columns:

Left bracket

This is used for “bracketing” several lines together when creating conditions with multiple lines and the boolean operators And/Or.

Filter Target

Here you select which property to look for when finding elements. Your choice here affects the available options in the other columns as well.

Condition

This determines how the Logical Editor compares the property in the Filter Target column to the values in the Parameter columns (see below). The available options depend on the Filter Target setting.

Parameter 1

Here you set which value the element properties are compared to (depending on the Filter Target).

For example, if the Filter Target is “Position” and Condition is “Equal”, the Logical Editor will look for all elements starting at the position you specify in the Parameter 1 column.

Parameter 2

This column is used if you have selected one of the “Range” options in the Condition column. This allows you to find all elements with values inside (or outside) the range between Parameter 1 and Parameter 2.

Furthermore, if you want to find certain VST 3 events (Filter Target set to “Type is” and Parameter 1 set to “VST3 Event”), you can use the Parameter 2 column to specify the VST 3 parameter that you are searching for, e.g. Tuning.

Bar Range/Time Base (Logical Editor only)

This column is only used if the Filter Target is set to “Position”. If one of the “Bar Range” options is selected in the Condition column, you use the Bar Range/Time Base column to specify “zones” within each bar (for example, allowing you to find all elements on or around the first beat of every bar). If any of the other Condition options is selected, you can use the Bar Range/Time Base column to specify the time base (PPQ, Seconds, etc.).

Right bracket

This is used for “bracketing” several lines together.

bool

This allows you to insert the boolean operators And/Or, when creating conditions with multiple lines.

You can also set up filter conditions by dragging MIDI events directly into the upper list.

If the list contains no entries, a MIDI event dragged into this section will form conditions including the state and type of the event. If it contains entries, the dragged event will initialize the matching parameters. For example, if a length condition is used, the length will be set according to the length of the event.

RELATED LINKS
Combining multiple condition lines on page 968
Searching for elements at certain positions (Logical Editor only) on page 940

Conditions

Depending on the Filter Target setting, the following options can be selected in the Condition column:

Equal

…has the exact same value as set up in the Parameter 1 column.

Unequal

…has any value other than the one set up in the Parameter 1 column.

Bigger

…has a value higher than the one set up in the Parameter 1 column.

Bigger or Equal

…has a value that is the same as or higher than the one set up in the Parameter 1 column.

Less

…has a value lower than the one set up in the Parameter 1 column.

Less or Equal

…has a value that is the same as or lower than the one set up in the Parameter 1 column.

Inside Range

…has a value that is between the values set up in the Parameter 1 and Parameter 2 columns. Note that Parameter 1 should be the lower value and Parameter 2 the higher.

Outside Range

…has a value that is not between the values set up in the Parameter 1 and Parameter 2 columns.

Inside Bar Range (Logical Editor only)

…is within the “zone” set up in the Bar Range/Time Base column (Position only), in each bar within the current selection.

Outside Bar Range (Logical Editor only)

…is outside the “zone” set up in the Bar Range/Time Base column (Position only), in each bar within the current selection.

Before Cursor (Logical Editor only)

…is before the song cursor position (Position only).

Beyond Cursor (Logical Editor only)

…is after the song cursor position (Position only).

Inside Track Loop (Logical Editor only)

…is inside the set track loop (Position only).

Inside Cycle (Logical Editor only)

…is inside the set cycle (Position only).

Exactly matching Cycle (Logical Editor only)

…exactly matches the set cycle (Position only).

Note is equal to

…is the note specified in the Parameter 1 column, regardless of octave (Pitch only). For example, lets you find all C notes, in all octaves.

NOTE

The Conditions for the “Property” filter target are different.

Below, the different Filter Targets (and their corresponding Condition and Parameter options) are described in more detail.

RELATED LINKS

Searching for properties on page 944

Searching for elements at certain positions (Logical Editor only)

Selecting “Position” in the Filter Target column lets you find elements starting at certain positions, either relative to the start of the song or within each bar.

- If you select any condition other than the Range or Bar Range options, you set up a specific position (in PPQ, seconds, samples, or frames) in the Parameter 1 column. Use the Bar Range/Time Base column to specify the time base.

(	Filter Target	Condition	Parameter 1
(	Position	Equal	1.01.01.000

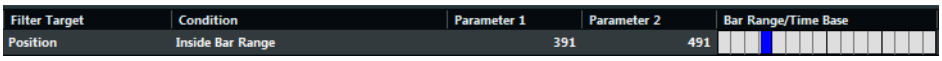
  Here, the Logical Editor will find all elements at 1.1.1.0 in the project.

- If you select Inside Range or Outside Range in the Condition column, you set the start position of the range in the Parameter 1 column and the end position in the Parameter 2 column. You can also change the time base using the Bar Range/Time Base column.

  The Logical Editor will then find all elements inside or outside this position range.

- If you select one of the Bar Range options in the Condition column, the Bar Range/Time Base column will show a graphic bar display. You specify the range within the bar by clicking and dragging in the bar display (the specified Bar Range is indicated in blue).

The Logical Editor will then find all elements starting inside or outside this Bar Range, in all bars (within the current selection).



Here, the Logical Editor will find elements starting around the second beat in each bar.

Searching for notes of certain lengths (Logical Editor only)

Only note events have lengths (actually, a note is made up of separate note-on and note-off events but in Nuendo it is considered as a single event with a length). Therefore, the “Length” Filter Target is only valid if you are specifically searching for notes – there has to be another condition line with the Filter Target “Type”, Condition “Equal” and Parameter 1 set to “Note”.

RELATED LINKS

Combining multiple condition lines on page 968

Searching for Value 1 or Value 2

A MIDI event is composed of several values. What is displayed for Value 1 and 2 depends on the type of event:

Event type	Value 1	Value 2
Notes	The Note Number/Pitch.	The velocity of the note.
Poly Pressure	The key that was pressed.	The amount of pressure for the key.
Controller	The type of Controller, displayed as a number.	The amount of Control Change.
Program Change	The Program Change number.	Not used.
Aftertouch	The amount of pressure.	Not used.
Pitchbend	The “fine-tune” of the bend. Not always used.	The coarse amount of bend.
VST3 Event	Not used.	The value of the VST3 Event parameter. The value range of the VST 3 event (0.0 to 1.0) is transformed into the MIDI value range (0-127), i.e., the VST 3 event value 0.5 corresponds to 64. For some operations that require a higher resolution, you can make use of the “VST3 Value Operation” parameter.

NOTE

System Exclusive events are not included in the table above, because they do not use value 1 and 2.

Because value 1 and 2 have different meanings for different events, searching for value 2 = 64 would both find notes with the velocity 64 and controllers with the amount 64, etc. If this is not what you want, you can add an additional filter condition line with the Filter Target “Type”, specifying which type of events to find (see below).

IMPORTANT

This is particularly useful when searching for note pitch or velocity values, as described below.

The general procedures when searching for value 1 or 2 are:

- If you select any Condition other than the Range options, you set up a specific value in the Parameter 1 column.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)
(	Value 2	Less	80			)

  Here, the Logical Editor will find all events with a value 2 less than 80.

- If you select Inside Range or Outside Range in the Condition column, the range consists of the values between Parameter 1 and Parameter 2.

  Note that Parameter 1 should have the lower value.

RELATED LINKS

Action Target on page 969

Searching for note pitch or velocity

If you add another condition line with the Filter Target “Type”, Condition “Equal” and Parameter 1 set to “Note”, the Logical Editor will “know” you are searching for pitch or velocity.

This has the following benefits:

- The Filter Targets Value 1 and Value 2 will be displayed as “Pitch” and “Velocity” respectively, making it easier to grasp the function of the filter condition.
- Pitch values in the Parameter columns will be displayed as note names (C3, D#4, etc.). When entering pitch values you can either type a note name or a MIDI note number (0–127).
- When Value 1 (pitch) is selected as Filter Target, an additional option appears in the Condition column: “Note is equal to”. When this is selected, you specify a note name in the Parameter 1 column but without any octave number (C, C#, D, D#, etc.). The Logical Editor can then find all notes of a certain key, in all octaves.

RELATED LINKS

Combining multiple condition lines on page 968

Searching for controllers

There is similar extended functionality when searching for controllers: If you have added an additional “Type = Controller” condition line, the Logical Editor will “know” you are searching for controllers. The Parameter 1 column will then show the names of the MIDI controllers (Modulation, Volume, etc.) when Value 1 is selected as Filter Target.

Searching for MIDI channels

Each MIDI event contains a MIDI channel setting (1–16). Normally, these settings are not used, since the MIDI event plays back on the MIDI channel set for its track.

However, you can come across MIDI parts with events set to different channels, for example in the following scenarios:

- If you have recorded MIDI from an instrument sending on several different channels (e.g. a master keyboard with different key zones).
- If you have imported a MIDI file of type 0 (with a single track, containing MIDI events with different channel settings).

Searching for MIDI channel values is straightforward; you select a Condition and enter a MIDI channel (1–16) in the Parameter 1 column (and, if you have selected one of the Range Conditions, a higher channel in the Parameter 2 column, creating a value range).

Searching for element types

Selecting Type as the Filter Target allows you to find elements of a certain type only.

- The Condition column contains only three options: Equal, Unequal and All Types.
- Clicking the Parameter 1 column displays a pop-up menu, listing the available types (Note, Poly Pressure, Controller, etc.).

The Logical Editor will find all elements matching or not matching the selected type (depending on the Condition).

IMPORTANT

As mentioned above, selecting Type = Note or Type = Controller adds some additional functionality to the Logical Editor. You should make it a habit to add a Type condition when applicable.

Searching for properties

On the Filter Target pop-up menu, you will find an option called Property. This allows you to search for properties that are not part of the MIDI standard but rather Nuendo-specific settings.

When the Property option is selected, the Condition column has two options: “Property is set” and “Property is not set”. Which property to look for is selected in the Parameter 1 column. The options are “muted”, “selected”, “empty”, “inside NoteExp”, and “valid VST3”. Some examples:

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Property	Property is set	Event is muted		

Here, the Logical Editor will find all muted events.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
(	Property	Property is set	Event is selected		
	Property	Property is set	Event is muted		

Here, the Logical Editor will find all events that are selected and muted.

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Type Is	Unequal	Note		
Property	Property is set	Event inside NoteExp		

NEK only: Here, the Logical Editor will find all Note Expression data.

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Type Is	Equal	Controller		
Property	Property is set	Event inside NoteExp		

NEK only: Here, the Logical Editor will find all MIDI controller events that form part of Note Expression data.

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Type Is	Equal	VST3 Event	All Types	
Property	Property is set	Event is valid VST3		

NEK only: Here, the Logical Editor will find all VST 3 events that cannot be played back, because there is no Note Expression compatible VST instrument on the related track.

Searching for event contexts

On the Filter Target pop-up menu, you will find an option called “Last Event”. This can be used to perform context-dependent searches (especially useful in the Input Transformer).

“Last Event” indicates the state of an event which has already passed the Input Transformer/Logical Editor. The condition has to be combined with Parameter 1 and Parameter 2.

Below, you will find a few examples on how the Last Event filter target can be used.

Here, the action will only be performed when the sustain pedal is down:

Filter Target	Condition	Parameter 1	Parameter 2
Last Event	Equal	MIDI Status	176/Controller
Last Event	Equal	Value 1	64
Last Event	Bigger	Value 2	64

In this example, the action will be performed when the note C1 is pressed (the “Note is playing” condition is only available in the Input Transformer and in the Transformer effect):

Filter Target	Condition	Parameter 1	Parameter 2
Type is	Equal	Note	
Last Event	Equal	Note is playing	36/C1

In this example, the action will be performed after playing the C1 note:

Filter Target	Condition	Parameter 1	Parameter 2
Last Event	Equal	Value 1	36/C1

NEK only: In this example, the action will be performed for Note Expression VST 3 Tuning events that are attached to a C1 note when C1 is pressed:

Filter Target	Condition	Parameter 1	Parameter 2
Type is	Equal	VST3 Event	Tuning
Last Event	Equal	MIDI Status	144/Note On
Last Event	Equal	Value 1	36/C1

Searching for Chords (Logical Editor only) (NEK only)

NOTE

A note belongs to a chord, if at least two other notes play at the same time.

The Context Variable option on the Filter Target pop-up menu allows you to search for chords in a MIDI part or on the chord track.

When Context Variable is selected, the Condition column shows the following options: Equal, Unequal, Bigger, Bigger or Equal, Less, Less or Equal, Inside Range, Outside Range.

Parameter 1 allows you to specify which context variable is searched:

Parameter 1	Searches for…
Highest/Lowest/Average Pitch	…notes with the highest, lowest or average pitch in the selected MIDI part.
Highest/Lowest/Average Velocity	…notes with the highest, lowest or average velocity in the selected MIDI part.
Highest/Lowest/Average CC Value	…controllers with the highest, lowest or average value in the selected MIDI part.

For the following values of Parameter 1 you have to specify a Parameter 2:

Parameter 1	Parameter 2	Searches for…
No. of Notes in Chord (Part)	Enter a value for the number of notes in the chord.	…chords with the specified number of notes in the selected MIDI part.
No. of Voices (Part)	Enter a number for the number of voices of the chord.	…chords with the specified number of voices in the selected MIDI part.
Position in Chord (Part)	Select the position (interval) in the chord.	…the specified chord interval in the selected MIDI part.
Note Number in Chord (lowest = 0)	Enter a number for the voicing number of chord.	…the specified voicing number in the selected MIDI part.
Position in Chord (Chord track)	Select the position (interval) in the chord.	… the specified chord interval in the selected MIDI part. The Chord track is taken as reference.
Voice	Select a voice in the chord.	…the specified voice in the selected MIDI part.

The Musical Context presets give you an idea of the possibilities of this filter target.

RELATED LINKS

Conditions on page 939
Working with presets on page 974

Combining multiple condition lines

As described above, you can add condition lines by clicking the "+" button below the list. The result of combining condition lines depends on the boolean And/Or operators and the brackets.

The bool column

By clicking in the "bool" column to the right in the list, you can select a boolean operator: "And" or "Or".

A boolean operator combines two condition lines and determines the result in the following way:

- If two condition lines are combined with a boolean And, both conditions must be fulfilled for an element to be found.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Type Is	Equal	Note				And
	Position	Equal	3.01.01.000		PPQ	)	

The Logical Editor will only find elements that are notes and start at the beginning of the third bar.

- If two condition lines are combined with a boolean Or, one of the conditions (or both) must be fulfilled for an element to be found.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Type Is	Equal	Note				Or
	Position	Equal	3.01.01.000		PPQ	)	

The Logical Editor will find all events that are notes (regardless of their position) and all events starting at the beginning of the third bar (regardless of their type).bar.

When you add a new condition line, the boolean setting defaults to And. Therefore, if all you want to do is set up two or more conditions that all must be met for an element to be found, you do not have to think about the boolean column – just add the required lines and make the usual filter settings.

Using brackets

The bracket (parenthesis) columns let you enclose two or more condition lines, dividing the conditional expression into smaller units. This is only relevant when you have three or more condition lines and want to use the boolean Or operator.

This is how it works:

- Without brackets, the conditional expressions are evaluated according to their order in the list.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Type Is	Equal	Note				And
	Pitch	Equal	C3				Or
	Channel	Equal	1			)	

In this case the Logical Editor will find all MIDI notes with the pitch C3, as well as all events (regardless of their type) set to MIDI channel 1.

Maybe you wanted to find all notes that either had the pitch C3 or the MIDI channel 1 (but no non-note events)? Then you need to add some brackets:

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Type Is	Equal	Note				And
(	Pitch	Equal	C3				Or
	Channel	Equal	1			)	

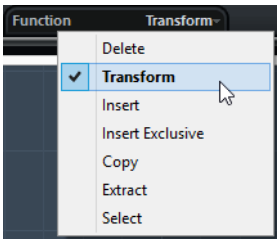
- Expressions within brackets are evaluated first.

  If there are several layers of brackets, these are evaluated “from the inside out”, starting with the innermost brackets.

You add brackets by clicking in the bracket columns and selecting an option. Up to triple brackets can be selected.

Selecting a function

The pop-up menu at the bottom of the Logical Editor is where you select the function – the basic type of editing to be performed.



Below, the available options are listed. Note that some options are not available in the Transformer effect.

Delete

Deletes all elements found by the Logical Editor. In the case of the Transformer, this function will remove (or “mute”) all found elements from the “output stream” – the actual elements on the track are not affected.

Transform

Changes one or several aspects of the found elements. You set up exactly what is changed in the action list.

Insert

This will create new elements and insert these into the part(s) (Logical Editor) or the output stream (Transformer). The new elements will be based on the elements found by the Logical Editor’s filter conditions, but with any changes you have set up in the action list applied.

Another way of expressing this is that the Insert function copies the found elements, transforms them according to the action list and inserts the transformed copies among the existing elements.

Insert Exclusive

This will transform the found elements according to the action list. Then, all elements that were not found (that did not meet the filter conditions) are deleted (Logical Editor) or removed from the output stream (Transformer).

Copy (Logical Editor only)

This will copy all found elements, transform them according to the action list and paste them into a new part on a new MIDI track. The original events are not affected.

Extract (Logical Editor only)

This works like Copy, but will cut the found events instead. Or in other words, Extract will transform all found events and move them to a new part on a new MIDI track.

Select (Logical Editor only)

This will simply select all found events, highlighting them for further work in the regular MIDI editors.

RELATED LINKS

Specifying actions on page 949

Specifying actions

The lower list in the Logical Editor window is the action list. This is where you specify any changes that are made to the found events (relevant for all function types except Delete and Select).

Action Target	Operation	Parameter 1	Parameter 2
Value 1	Set to fixed value	2	

The handling of the action list is similar to the filter condition list, but without the brackets and booleans. You simply add lines by clicking the "+" button below the list, and fill out the columns as required. To remove a superfluous action line, select it and click the "-" button.

Action Target

This is where you select the property that is changed in the events:

Option	Description
Position (Logical Editor only)	Adjusting this value will move the events.
Length (Logical Editor only)	Lets you resize the events (notes only).
Value 1	This adjusts value 1 in the events. What is displayed for value 1 depends on the event type. For notes, value 1 is the pitch.
Value 2	This adjusts value 2 in the events. What is displayed for value 2 depends on the event type. For notes, value 2 is the velocity value.
Channel	Allows you to change the MIDI channel setting.
Type	Allows you to change the event type, e.g. transform aftertouch events to modulation events, or pitchbend events to VST 3 Tuning events.
Value 3	This adjusts value 3 in the events, which is used for handling of Note-off velocity when searching for properties.
NoteExp Operation (Logical Editor only)	NEK only: Allows you to specify a Note Expression operation in the Operation column.

Option	Description
VST3 Value Operation (Logical Editor only)	Allows you to perform common operations within the VST 3 value range (0.0 to 1.0) instead of the standard MIDI value range (0-127), for finer adjustments.

NOTE

The Position and Length parameters are interpreted via the time base setting in the Bar Range/Time Base column, with the exception of the Random setting, which uses the time base of the affected events.

RELATED LINKS

Searching for properties on page 967
Searching for Value 1 or Value 2 on page 941

Operation

This setting determines what to do with the Action Target. The options on this pop-up menu are different depending on the selected Action Target.

Below, all available operations are listed:

Add

Adds the value specified in the Parameter 1 column to the Action Target.

Subtract

Subtracts the value specified in the Parameter 1 column from the Action Target.

Multiply by

Multiplies the Action Target value with the value specified in the Parameter 1 column.

Divide by

Divides the Action Target value by the value specified in the Parameter 1 column.

NEK only: VST3 Value Operation – Invert (Logical Editor only)

Inverts Note Expression data containing the specified VST 3 event parameter.

Round by

This “rounds” the Action Target value using the value specified in the Parameter 1 column. In other words, the Action Target value is changed to the closest value that can be divided by the Parameter 1 value.

For example, if the Action Target value is 17 and Parameter 1 is 5, the result of rounding will be 15 (the closest value that can be divided by 5). Another word for this type of operation would be “quantizing”, and it is actually possible to use it for this, by setting the Action Target to “Position” and specifying a quantize value with Parameter 1 (in ticks, with 480 ticks per quarter note).

Set Random Values between

This will set the Action Target value to a random value within the range specified with Parameter 1 and 2.

Set to fixed value

This sets the Action Target to the value specified in the Parameter 1 column.

Set Relative Random Values between

This will add a random value to the current Action Target value. The added random value will be within the range specified with Parameter 1 and 2. Note that these can be set to negative values.

For example, if you set Parameter 1 to -20 and Parameter 2 to +20, the original Action Target value will get a random variation, never exceeding ±20.

Add Length (Logical Editor only)

This is only available when Action Target is set to Position. Furthermore, it is only valid if the found events are notes (and thus have a length). When Add Length is selected, the length of each note event will be added to the Position value. This can be used for creating new events (using the Insert function) positioned relative to the end positions of the original notes.

Transpose to Scale

This is only available when Action Target is set to Value 1, and when the filter conditions are specifically set up to find notes (a “Type = Note” filter condition line has been added). When “Transpose to Scale” is selected, you can specify a musical scale using the Parameter 1 and 2 columns. Parameter 1 is the key (C, C#, D, etc.) while Parameter 2 is the type of scale (major, melodic or harmonic minor, etc.).

Each note will be transposed to the closest note in the selected scale.

Use Value 2

This is only available when Action Target is set to Value 1. If this option is selected, the Value 2 setting in each event will be copied to the Value 1 setting.

This is useful, for example, if you are transforming all Modulation controllers to Aftertouch events (since controllers use Value 2 for their amount, while Aftertouch uses Value 1).

Use Value 1

This is only available when Action Target is set to Value 2. If this option is selected, the Value 1 setting in each event will be copied to the Value 2 setting.

Mirror

This is only available when Action Target is set to Value 1 or Value 2. When this option is selected, the values will be “mirrored” around the value set in the Parameter 1 column.

In the case of notes, this will invert the scale, with the key set in the Parameter 1 column as “center point”.

Linear Change in Loop Range (Logical Editor only)

This will affect events within the loop range (between the left and right locators) only. It will create a linear “ramp” of values (replacing the original values) starting at the value in the Parameter 1 column and ending at the Parameter 2 value.

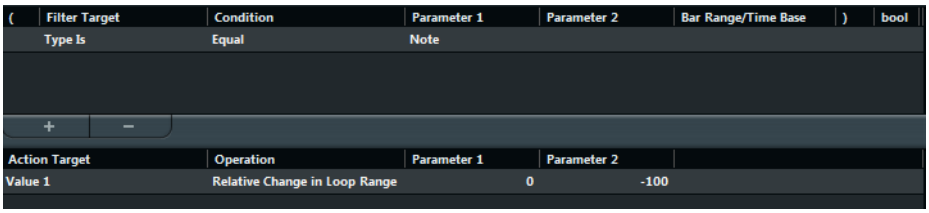
This can be used for creating linear controller sweeps, velocity ramps, etc.

Relative Change in Loop Range (Logical Editor only)

As with the previous option, this will create a ramp of values, affecting events in the loop range only (i.e. between the locators). However, here the changes are “relative”, meaning that values will be added to the existing values.

In other words, you set up a value ramp starting at Parameter 1 and ending at Parameter 2 (note that the Parameter values can be negative). The resulting value ramp is then added to the existing values for the events within the loop range.

For example, if you apply this to note velocities with Parameter 1 set to 0 and Parameter 2 set to -100, you create a velocity fade-out, keeping the original velocity relations:



NEK only: NoteExp Operation – Remove Note Expression (Logical Editor only)

This option is only available for notes. It allows you to remove all Note Expression data from a note.

NEK only: NoteExp Operation – Create One-Shot (Logical Editor only)

This option is only available for notes. It allows you to add Note Expression data for notes in “One Shot” mode, meaning that you add a parameter as Note Expression data. After having added the one-shot parameter, you have to set it to the desired value in a second go.

NEK only: NoteExp Operation – Reverse (Logical Editor only)

Reverses the Note Expression data.

RELATED LINKS

Searching for Value 1 or Value 2 on page 941

Applying the defined actions

Once you have set up filter conditions, selected a function and set the required actions (or loaded a preset), you apply the actions defined with the Logical Editor by clicking the Apply button.

IMPORTANT

In the Logical Editor, processing is not performed until you click the Apply button. When using the Transformer MIDI effect, there is no Apply button – the current settings are automatically applied in realtime during playback or live playing.

Logical Editor operations can be undone just like any other editing.

Working with presets

The Presets pop-up menu at the top of the window allows you to load, save, and manage Logical Editor presets.

- To load a preset, select it from the Presets pop-up menu. If available, an explanatory text appears to the right of the menu. When setting up your own presets, you can click in this area and enter a description.
- You can also select Logical Presets directly from the MIDI menu.

  This allows you to apply a preset to the selected MIDI part, without having to open the Logical Editor.
- It is also possible to select and apply Logical Presets from within the List Editor (from the Mask menu).
- It is also possible to set up a key command for a preset. That way you can conveniently apply the same operation to several selected events in one go.

RELATED LINKS

Key Commands on page 1168

Storing your own settings as a preset

If you have made Logical Editor settings that you want to use again, you can save them as a preset:

PROCEDURE

1. Click on the Store Preset button on the right of the Preset menu.

   A dialog for specifying a name for the new preset is displayed.
2. Enter a name for the preset and click OK.

   The preset is stored.

   To remove a preset, load it and click on the Remove Preset button.

Organizing and sharing presets

The Logical Editor presets are stored within the application folder in the Presets\Logical Edit subfolder. While these files cannot be edited “manually”, you can reorganize them (e.g. putting them in subfolders) like any files.

This also makes it easy to share presets with other Nuendo users, by transferring the individual preset files.

NOTE

The list of presets is read each time the Logical Editor is opened.

The Input Transformer

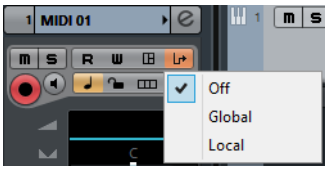
This function allows you to filter out and change MIDI data coming to a MIDI track before it is recorded. The Input Transformer is very similar to the Transformer MIDI effect, but contains four independent “modules”, for which you can set up different filtering and actions. You can activate any or all of these four modules.

Here are some of the things the Input Transformer allows you to do:

- Set up split keyboard combinations for recording left and right hands separately.
- Turn a controller like a foot pedal into MIDI notes (for playing bass drum the right way).
- Filter out one specific type of MIDI data on one MIDI channel only.
- Turn aftertouch into any controller (and vice versa).
- Invert velocity or pitch.

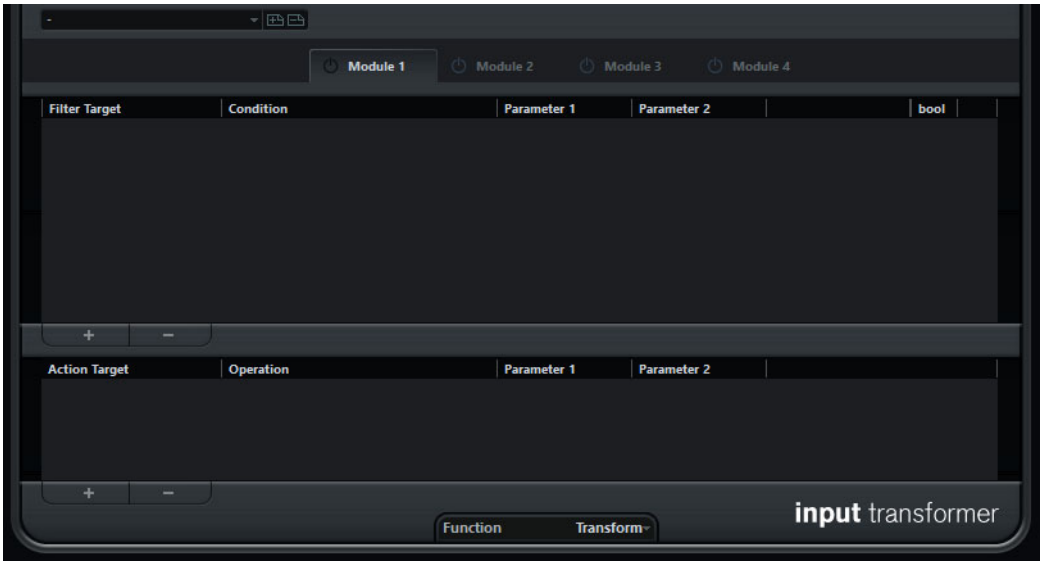
Opening the Input Transformer

To open the Input Transformer for a MIDI track, select the track and click the Input Transformer button in the Inspector to open the pop-up menu.



- Select Global to make Input Transformer settings that affect all MIDI inputs (and thereby all MIDI tracks).
- Select Local to make Input Transformer settings for this track only.

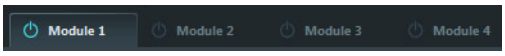
In both cases, the button lights up and the Input Transformer opens.



Handling the four modules

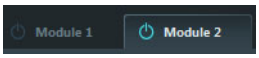
The Input Transformer is really four separate transformers, or modules.

- You select which module to view and make settings for by clicking the corresponding Module tab.

  Module 1 selected for viewing and editing.

- The On/Off buttons next to the Module names determine which module(s) are active.

  Here, Module 1 is inactive and Module 2 is active.

The Function pop-up menu

The Function pop-up menu contains two options: Filter and Transform.

- In Filter mode, only the filter conditions (the upper list) are taken into account. All events matching the conditions set up will be filtered out (excluded from the recording).
- In Transform mode, events matching the filter conditions will be transformed according to the settings in the action list (the lower list).

Setting up filtering and actions

This is done just like in the Logical Editor. Here is a brief rundown:

- Click the “+” button to add lines to the filter condition list or action list.

To remove a line, click it to select it and click the "-" button below the lists.

- Clicking the columns in the filter condition list opens pop-up menus allowing you to specify the conditions to match.
- Clicking the columns in the action list opens pop-up menus allowing you to specify how the found events are transformed (when Transform mode is selected).
- The Input Transformer has no Apply button – the settings are active as soon as you activate the On/Off button of a module.

  The settings made in the active modules will affect all MIDI data you record on the track.

NOTE

Closing the Input Transformer window does not turn it off – you need to deactivate the On/Off buttons of all modules for this! A lit Input Transformer button in the Inspector indicates that one or more modules are active.

RELATED LINKS

General procedure on page 959

Project Logical Editor

On the Edit menu you will find the function “Project Logical Editor…”. This opens a Project Logical Editor for the entire project. It works similar to the Logical Editor on the MIDI menu. The most important difference is that the Logical Editor for MIDI works at the event level, whereas the Project Logical Editor works at the project level and is therefore a very powerful tool for “search and replace” functions in your entire project.

NOTE

The MIDI events in the MIDI parts will not be affected by the Project Logical Editor operations. If you want to change MIDI notes or controller data, you have to use the Logical Editor.

With the Project Logical Editor, you can combine filter conditions with actions to create complex procedures, e.g. for special track type operations on tracks that are named identically. You can use its functions to delete all muted MIDI parts or to toggle the open state of all folder tracks in your project, etc.

Included with the Project Logical Editor are a number of presets that give you an impression of the great possibilities that this feature offers. Many of them can also be used as starting points when you set up your own editing operations.

The principle for the Project Logical Editor is this:

- You set up filter conditions to find certain elements.

  This can be elements of a certain type, with certain attributes or values or on certain positions, in any combination. You can combine any number of filter conditions and make composite conditions using AND/OR operators.

- You select the basic function to be performed.

  The options are Transform (changing properties of the found elements), Delete (removing the elements) and Select (selecting the found elements).

- You set up a list of actions, which specify exactly what is done.

  This is not necessary for all functions. For example, the Delete function does not require any additional action specifications – it simply removes all found elements.

- In the Macro pop-up menu you can choose an additional macro that will be executed after the actions you defined.

  Use this to extend the possibilities offered by combining the filter conditions and actions specified in the Project Logical Editor even further.

By combining filter conditions, functions, the specific actions, and additional macros, you can perform very powerful processing.

IMPORTANT

The Project Logical Editor allows all kinds of settings that may not always make sense. Experiment a bit before applying your edits to important projects. You can undo the operations by using the Undo command on the Edit menu.

RELATED LINKS

Working with presets on page 974
The Logical Editor, Transformer, and Input Transformer on page 935

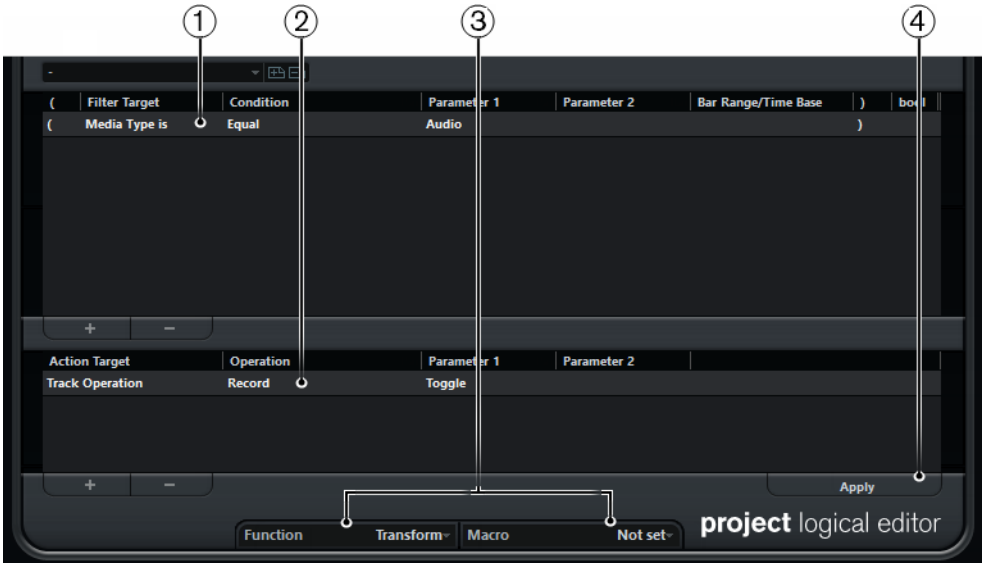
Opening the Project Logical Editor

PROCEDURE

1. Open the desired project.
   All elements in the project will be affected, you do not have to make any selection.
2. Select “Project Logical Editor…” from the Edit menu.

Window overview

To understand the Project Logical Editor, it might be a good idea to start by exploring the included presets. These are found on the Presets pop-up menu at the top of the window.



1) List of filter conditions
2) Action List

3) Function and Macro pop-up menus
4) Apply button

RELATED LINKS
Working with presets on page 974

Setting up filter conditions

General procedure

The upper list is where you set up the filter conditions, determining which elements to find. The list contains one or several conditions, each on a separate line.

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Media Type is	Equal	MIDI		
Container Type is	Equal	Track		

- To add a new condition, click the "+" button below the list.

  The new line is added at the bottom of the list. If there are many lines, you may need to use the scrollbar to the right to view them.

- To remove a condition, select it and click the Delete button (-) below the list.

NOTE

If you have already defined filter conditions and/or applied a preset, but want to start again from scratch, you can initialize the settings by selecting the Init option from the Presets pop-up menu.

You set up a filter condition line by clicking in the columns and selecting options from the pop-up menus that appear. Here is a brief description of the columns:

Left bracket

This is used for "bracketing" several lines together when creating conditions with multiple lines and the boolean operators And/Or.

Filter Target

Here you select which property to look for when finding elements. Your choice here affects the available options in the other columns as well, see below!

Condition

This determines how the Project Logical Editor compares the property in the Filter Target column to the values in the Parameter columns. The available options depend on the Filter Target setting.

Parameter 1

Here you set which value the element properties are compared to (depending on the Filter Target).

For example, if the Filter Target is “Position” and Condition is “Equal”, the Project Logical Editor will look for all elements starting at the position you specify in the Parameter 1 column.

Parameter 2

This column is only used if you have selected one of the “Range” options in the Condition column. Typically, this allows you to find all elements with values inside (or outside) the range between Parameter 1 and Parameter 2.

Bar Range/Time Base

This column is only used if the Filter Target is set to “Position”. If one of the “Bar Range” options is selected in the Condition column, you use the Bar Range/Time Base column to specify “zones” within each bar (allowing you to find all elements on or around the first beat of every bar, for example). If any of the other Condition options is selected, you can use the Bar Range/Time Base column to specify the time base (PPQ, Seconds, etc.).

Right bracket

This is used for “bracketing” several lines together.

bool

This allows you to insert the boolean operators And/Or, when creating conditions with multiple lines.

Below, the different Filter Targets (and their corresponding Condition and Parameter options) are described in more detail.

RELATED LINKS

Searching for elements at certain positions on page 964
Combining multiple condition lines on page 968

Searching for Media types

PROCEDURE

1. Select “Media Type” in the Filter Target pop-up menu.

   This allows you to find elements of certain types of media only.

2. Open the pop-up menu in the Parameter 1 column and select the desired option.

3. Open the pop-up menu in the Condition column and select the desired condition.

   For example, if you have set up the Project Logical Editor like this…

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Media Type is	Equal	Marker		

   …it will find all marker events and tracks in the project.

Media type filter

When the Filter Target is set to Media Type, the pop-up menu lists the available media types.

Audio

If no container type is specified, this finds audio events, audio parts and audio tracks.

MIDI

If no container type is specified, this finds MIDI parts and MIDI tracks.

Automation

If no container type is specified, this finds automation events and automation tracks.

Marker

If no container type is specified, this finds marker events and marker tracks.

Transpose

If no container type is specified, this finds transpose events and transpose tracks.

Arranger

If no container type is specified, this finds arranger events and arranger tracks.

Tempo

If no container type is specified, this finds tempo events and tempo tracks.

Signature

If no container type is specified, this finds signature events and signature tracks.

Chord (NEK only)

If no container type is specified, this finds chord events and chord tracks.

Scale Event

If no container type is specified, this finds scale events.

Video

If no container type is specified, this finds video events.

Group

If no container type is specified, this finds group tracks.

Effect

If no container type is specified, this finds FX channel tracks.

For media types, the following options are available:

Equal

This finds the Media Type set up in the Parameter 1 column.

All Types

This finds all Media Types.

Searching for Container types

PROCEDURE

1. Select Container Type in the Filter Target pop-up menu.

   This allows you to find parts, events or tracks.

2. Open the pop-up menu in the Parameter 1 column and select the desired option.

3. Open the pop-up menu in the Condition column and select the desired condition.

   For example, if you have set up the Project Logical Editor like this…

Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base
Container Type is	Equal	FolderTrack		

   …it will find all Folder tracks in the project.

Container type filter

When the Filter Target is set to Container Type, the pop-up menu lists the available container types.

Folder Track

This finds all folder tracks, included FX Channel and Group Channel folders.

Track

This finds all track types.

Part

This finds audio, MIDI, and instrument parts. Folder parts will not be found.

Event

This finds automation points, markers, as well as audio, arranger, transpose, tempo and time signature events.

For container types, the following options are available:

Equal

This finds the Container Type set up in the Parameter 1 column.

All Types

This finds all Container Types.

Combining Media Type and Container Type

The combination of the filter targets Media Type and Container Type represents a versatile tool for logical operations:

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Media Type is	Equal	MIDI				And
	Container Type is	Equal	Part			)	

Here, the Project Logical Editor will find all MIDI and instrument parts in the project.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Media Type is	Equal	Automation				And
	Container Type is	Equal	Track				And
	Name	Contains	vol			)	

Here, the Project Logical Editor will find all automation tracks (not events) in the project whose name contains vol.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Media Type is	Equal	MIDI				And
	Container Type is	Equal	Part				And
	Property	Not set	Event is muted			)	

Here, the Project Logical Editor will find all MIDI and instrument parts (not tracks) in the project that are muted.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(((	Media Type is	Equal	MIDI				And
	Container Type is	Equal	Part			)	Or
(	Media Type is	Equal	Audio				And
	Container Type is	Equal	Event			))	And
	Property	Property is not set	Event is muted			)	

Here, the Project Logical Editor will find all MIDI and instrument parts (not tracks) or all audio events (not parts or tracks) in the project that are muted.

Searching for Names

PROCEDURE

1. Select Name on the Filter Target pop-up menu.
2. Enter the desired name, or a part of a name in the Parameter 1 column.
3. Open the pop-up menu in the Condition column and select the desired condition.

   For names, the following options are available:

   - Equal

     This is the exact same text string as set up in the Parameter 1 column.
   - Contains

     This contains the text specified in the Parameter 1 column.

   For example, if you have set up the Project Logical Editor like this…

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Container Type is	Equal	Track				And
	Name	Contains	voc			)	

…it will find all tracks in the project whose name contains “voc”.

NOTE

To take maximum advantage of this feature, we recommend using a standard nomenclature in your projects (Drums, Perc, Voc, etc.).

Searching for elements at certain positions

PROCEDURE

1. Select “Position” in the Filter Target pop-up menu.

   This allows you to find elements starting at certain positions, either relative to the start of the project or within each bar.

2. Open the pop-up menu in the Condition column and select the desired condition.

   - If you select any condition other than the Range, Bar Range, Cursor, Loop or Cycle options, you set up a specific position (in PPQ, seconds, samples, or frames) in the Parameter 1 column. Use the Bar Range/Time Base column to specify the time base. Note that the position for Bar Range is measured in ticks related to the start of the bar.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
(	Position	Equal	5.01.01.000		PPQ	)	

     Here, the Project Logical Editor will find all elements at the PPQ position 5.1.1. in the project.

   - If you select Inside Range or Outside Range in the Condition column, you set the start position of the range in the Parameter 1 column and the end position in the Parameter 2 column. You can also change the time base using the Bar Range/Time Base column.

     The Project Logical Editor will then find all elements inside or outside this position range.

   - If you select one of the Bar Range options in the Condition column, the Bar Range/Time Base column will show a graphic bar display. You specify the range within the bar by clicking and dragging in the bar display (the specified Bar Range is indicated in blue).

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Position	Inside Bar Range	419	541			

     Here, the Project Logical Editor will find elements starting around the second beat in each bar.

     The Project Logical Editor will then find all elements starting inside or outside this Bar Range, in all bars (within the current selection).

Position filter

For positions, the following options are available:

Equal

…has the exact same value as set up in the Parameter 1 column.

Unequal

…has any value other than the one set up in the Parameter 1 column.

Bigger

…has a value higher than the one set up in the Parameter 1 column.

Bigger or Equal

…has a value that is the same as or higher than the one set up in the Parameter 1 column.

Less

…has a value lower than the one set up in the Parameter 1 column.

Less or Equal

…has a value that is the same as or lower than the one set up in the Parameter 1 column.

Inside Range

…has a value that is between the values set up in the Parameter 1 and Parameter 2 columns. Note that Parameter 1 should be the lower value and Parameter 2 the higher.

Outside Range

…has a value that is not between the values set up in the Parameter 1 and Parameter 2 columns.

Inside Bar Range

…is within the “zone” set up in the Bar Range/Time Base column, in each bar within the current selection.

Outside Bar Range

…is outside the “zone” set up in the Bar Range/Time Base column, in each bar within the current selection.

Before Cursor

…is before the song Project position.

Beyond Cursor

…is after the song Project position.

Inside Track Loop

…is inside the set track loop.

Inside Cycle

…is inside the set cycle.

Exactly Matching Cycle

…exactly matches the set cycle.

RELATED LINKS

Setting Up the Independent Track Loop on page 569

Searching for elements of certain lengths

PROCEDURE

1. Select Length in the Filter Target pop-up menu.

   This allows you to find elements of a certain length only. The Length parameter is interpreted via the time base setting in the Bar Range/Time Base column, i.e. in PPQ, seconds, samples, or frames.

2. Open the pop-up menu in the Condition column and select the desired condition.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Container Type is	Equal	Part				Or
	Container Type is	Equal	Event				And
(	Media Type is	Equal	Audio				And
	Length	Less	0200		Samples	)	

   Here, the Project Logical Editor will find all audio parts and events in the project with a length smaller than 200 samples.

   If you select any condition other than the Range options, you set up a specific position in the Parameter 1 column.

Lengths filter

For lengths, the following options are available:

Equal

…has the exact same value as set up in the Parameter 1 column.

Unequal

…has any value other than the one set up in the Parameter 1 column.

Bigger

…has a value higher than the one set up in the Parameter 1 column.

Bigger or Equal

…has a value that is the same as or higher than the one set up in the Parameter 1 column.

Less

…has a value lower than the one set up in the Parameter 1 column.

Less or Equal

…has a value that is the same as or lower than the one set up in the Parameter 1 column.

Inside Range

…has a value that is between the values set up in the Parameter 1 and Parameter 2 columns. Note that Parameter 1 should be the lower value and Parameter 2 the higher.

Outside Range

…has a value that is not between the values set up in the Parameter 1 and Parameter 2 columns.

Searching for properties

PROCEDURE

1. Select “Property” on the Filter Target pop-up menu.
2. Open the pop-up menu in the Condition column and select the desired condition.

   When the Property option is selected, the Condition column has two options: “Property is set”, and “Property is not set”.
3. Open the pop-up menu in the Parameter 1 column and select the desired option.

   This sets which property will be searched.

   Three examples:

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Media Type is	Equal	MIDI				And
	Container Type is	Equal	Part				And
	Property	Property is set	Event is muted				

Here, the Project Logical Editor will find all muted MIDI and instrument parts.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Media Type is	Equal	Audio				And
	Container Type is	Equal	Part				And
	Property	Property is set	Event is selected				And
	Property	Property is set	Event is empty				

Here, the Project Logical Editor will find all elements that are selected but not muted.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Property	Property is set	Event is selected				And
	Property	Property is not set	Event is muted				

Here, the Project Logical Editor will find all selected audio parts that are empty.

NOTE

Note that “event” in this context refers to all the Project window elements that can be modified, e.g. MIDI parts, audio events and parts, or transpose, arranger, and automation events.

Combining multiple condition lines

As described above, you can add condition lines by clicking the “+” button below the list. The result of combining condition lines depends on the boolean And/Or operators and the brackets.

The bool column

By clicking in the “bool” column to the right in the list, you can select a boolean operator: “And” or “Or”. A boolean operator combines two condition lines and determines the result in the following way:

- If two condition lines are combined with a boolean And, both conditions must be fulfilled for an element to be found.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Media Type is	Equal	MIDI				And
	Container Type is	Equal	Track				

The Project Logical Editor will only find MIDI tracks.

- If two condition lines are combined with a boolean Or, at least one of the conditions must be fulfilled for an element to be found.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Container Type is	Equal	Part				Or
	Container Type is	Equal	FolderTrack				And
	Position	Exactly Matching Cycle			PPQ		

The Project Logical Editor will find all parts or events that match exactly the cycle.

IMPORTANT

When you add a new condition line, the boolean setting defaults to And. Therefore, if all you want to do is set up two or more conditions that all must be met for an element to be found, you do not have to think about the boolean column – just add the required lines and make the usual filter settings.

Using brackets

The bracket (parenthesis) columns let you enclose two or more condition lines, dividing the conditional expression into smaller units. This is only relevant when you have three or more condition lines and want to use the boolean Or operator.

You add brackets by clicking in the bracket columns and selecting an option. Up to triple brackets can be selected.

- Without brackets, the conditional expressions are evaluated according to their order in the list.

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Media Type is	Equal	Audio				And
	Name	Contains	perc				Or
	Name	Contains	drums				

Here, the Project Logical Editor will find all audio parts and events whose name contains perc as well as other parts and events (e. g. MIDI parts) whose name contains drums.

Maybe you want to find all audio parts and events that either contain the name perc or the name drums, but no other parts or events that contain the name drums? Then you need to add some brackets:

(	Filter Target	Condition	Parameter 1	Parameter 2	Bar Range/Time Base	)	bool
	Media Type is	Equal	Audio				And
(	Name	Contains	perc				Or
	Name	Contains	drums			)	

Here, all audio parts or events will be found whose name contains perc or drums.

NOTE

Expressions within brackets are evaluated first.

If there are several layers of brackets, these are evaluated “from the inside out”, starting with the innermost brackets.

Specifying actions

The lower list in the Project Logical Editor window is the action list. This is where you specify any changes that are made to the found elements, relevant for the function type Transform.

Action Target	Operation	Parameter 1	Parameter 2
Track Operation	Record	Toggle	

You can perform two different kinds of actions: track-based actions (such as Track Operation, Name) and event-based actions (such as Position, Length, Name). There are also actions that only take effect on automation data (Trim).

The handling of the action list is similar to the filter condition list, but without the brackets and boolean operators. You simply add lines by clicking the “+” button, and fill out the columns as required. To remove a superfluous action line, select it and click the “-” button.

Action Target

This is where you select the property that is changed. The Operations determine what to do with the Action Target. Below, all available operations are listed:

Position

Adjusting this value will move the elements. This parameter is interpreted via the time base setting in the Bar Range/Time Base column, with the exception of the Random setting, which uses the time base of the affected events:

Add

Adds the value specified in the Parameter 1 column to the Position.

Subtract

Subtracts the value specified in the Parameter 1 column from the Position.

Multiply by

Multiplies the Position value with the value specified in the Parameter 1 column.

Divide by

Divides the Position value by the value specified in the Parameter 1 column.

Round by

This “rounds” the Position value using the value specified in the Parameter 1 column. In other words, the Position value is changed to the closest value that can be divided by the Parameter 1 value.

For example, if the Position value is 17 and Parameter 1 is 5, the result of rounding will be 15 (the closest value that can be divided by 5). Another word for this type of operation would be “quantizing”, and it is actually possible to use it for this, by specifying a quantize value with Parameter 1 (in ticks, with 480 ticks per quarter note).

Set relative Random Values between

This will add a random value to the current Position value. The added random value will be within the range specified with Parameter 1 and 2. Note that these can be set to negative values.

For example, if you set Parameter 1 to -20 and Parameter 2 to +20, the original Position value will get a random variation, never exceeding ±20.

Set to fixed value

This sets the Position to the value specified in the Parameter 1 column.

Length

Lets you resize the elements. This parameter is interpreted via the time base setting in the Bar Range/Time Base column, with the exception of the Random setting, which uses the time base of the affected events:

Add

Adds the value specified in the Parameter 1 column to the Length.

Subtract

Subtracts the value specified in the Parameter 1 column from the Length.

Multiply by

Multiplies the Length value with the value specified in the Parameter 1 column.

Divide by

Divides the Length value by the value specified in the Parameter 1 column.

Round by

This “rounds” the Length value using the value specified in the Parameter 1 column. In other words, the Length value is changed to the closest value that can be divided by the Parameter 1 value.

Set to fixed value

This sets the Length to the value specified in the Parameter 1 column.

Set Random Values between

This will add a random value to the current length. The added random value will be within the range specified with Parameter 1 and 2.

Track Operation

This lets you change the track status.

Folder

Opens, closes or toggles folders.

Record

Enables, disables or toggles the record enable status.

Monitor

Enables, disables or toggles the monitor status.

Solo

Enables, disables or toggles the solo status.

Mute

Enables, disables or toggles the mute status.

Read

Enables, disables or toggles the read enable status.

Write

Enables, disables or toggles the write enable status.

EQ Bypass

Enables, disables or toggles the EQ bypass status.

Inserts Bypass

Enables, disables or toggles the inserts bypass status.

Sends Bypass

Enables, disables or toggles the sends bypass status.

Lanes Active

Enables, disables or toggles the lanes active status.

Hide Track

Enables, disables or toggles the track visibility status.

Name

This lets you rename the found elements.

Replace

Replaces names with the text specified in the Parameter 1 column.

Append

Names will be appended with the string specified in the Parameter 1 column.

Prepend

The name will be prepended with the string specified in the Parameter 1 column.

Generate Name

The name will be replaced by the text specified in the Parameter 1 column, followed by the number set with Parameter 2. The number will be increased by 1 for every found element.

Replace Search String

You can specify a search string under Parameter 1 that is replaced by the text specified in the Parameter 2 column.

Trim

This Action Target is used for automation only and lets you trim the found elements.

Multiply by

Multiplies the Trim value with the value specified in the Parameter 1 column.

Divide by

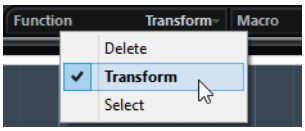
Divides the Trim value by the value specified in the Parameter 1 column.

Set Color

This lets you set the color for an element. For this Action Target the only Operation available is “Set to fixed value”. To use this, insert the name of a track color in the Parameter 1 column, e.g. “Color 7” to use dark green as track color.

Selecting a function

The left pop-up menu at the bottom of the Project Logical Editor is where you select the function – the basic type of editing to be performed.



The available options are:

Delete

Deletes all elements found by the Project Logical Editor.

NOTE

When you delete automation tracks and undo this operation by selecting Undo from the Edit menu, the automation tracks will be restored, but the tracks will be closed.

Transform

Changes one or several aspects of the found elements. You set up exactly what is changed in the action list.

Select

This will simply select all found elements, highlighting them for further work in the Project window.

Applying Macros

In the Macro pop-up menu you can select a macro that will be executed automatically after completing the actions defined using the Filter and Action lists. This is useful if you would like to extend the already powerful Project Logical Editor features even further.

To use this, you set up the macro that you need in the Key Commands dialog and then select it in the Project Logical Editor from the Macro pop-up menu.

For example, you can use the filter conditions to select all tracks that contain automation data for a certain automation parameter (such as “volume”) and use the macro “Select all on Track + Delete” to remove the automation events from these tracks (without deleting the tracks themselves).

RELATED LINKS

Setting up key commands on page 1169

Applying the defined actions

Once you have set up filter conditions, selected a function and set the required actions (or loaded a preset), you apply the actions defined with the Project Logical Editor by clicking the Apply button.

Project Logical Editor operations can be undone just like any other editing.

Working with presets

The Presets section in the upper left section of the window allows you to load, save and manage Project Logical Editor presets. A preset contains all settings in the window, which means you can simply load a preset, edit the settings (if necessary) and click Apply.

- To load a preset, select it from the Presets pop-up menu. If available, an explanatory text appears to the right of the menu. When setting up your own presets, you can click in this area to enter a description.
- You can also open the Edit menu and select Presets directly from the “Process Project Logical Editor” submenu. This allows you to apply a preset directly, without having to open the Project Logical Editor.
- You can also select Logical Presets directly from the MIDI menu.

  This allows you to apply a preset to the selected MIDI part, without having to open the Logical Editor.

  It is also possible to select and apply Logical Presets from within the List Editor (from the Show pop-up menu).
- It is also possible to set up a key command for a preset. That way you can conveniently apply the same operation to several selected events in one go.

RELATED LINKS

The Logical Editor, Transformer, and Input Transformer on page 935
Key Commands on page 1168

Storing your own settings as a preset

If you have made Project Logical Editor settings that you want to use again, you can save them as a preset:

PROCEDURE

1. Click the Store Preset button to the right of the Presets pop-up menu.

   A dialog for specifying a name for the new preset is displayed.

2. Enter a name for the preset and click OK.

   The preset is stored.

   NOTE

   To remove a preset, load it and click the Remove Preset button.

Organizing and sharing presets

The Project Logical Editor presets are stored within the application folder in the Presets\Logical Edit Project subfolder. While these files cannot be edited manually, you can reorganize them (e.g. putting them in subfolders) like any files.

This also makes it easy to share presets with other Nuendo users, by transferring the individual preset files.

NOTE

The list of presets is read each time the Project Logical Editor is opened.

Setting up key commands for your presets

If you have stored Project Logical Editor presets, you can set up key commands for them:

PROCEDURE

1. Open the File menu and select “Key Commands…”.

   The Key Commands dialog opens.
2. Use the list in the Commands column to navigate to the category “Process Project Logical Editor” and click the “+” sign to display the items in the folder.
3. In the list, select the item to which you wish to assign a key command, click in the “Type in Key” field and enter a new key command.
4. Click the Assign button above the field.

   The new key command appears in the Keys List.
5. Click OK to exit the dialog.

RELATED LINKS

Key Commands on page 1168

Editing tempo and signature

Background

Whenever you create a new project, Nuendo will automatically set the tempo and time signature for this project. The tempo and signature settings can be displayed in two ways: either on dedicated tracks in the Project window or in the Tempo Track Editor.

Tempo modes

Before we go into detail about tempo and signature settings, you should understand the different tempo modes.

For each track in Nuendo that can make use of this function, you can specify whether it is time-based or tempo-based. For tempo-based tracks, the tempo can either be fixed throughout the entire project (this is called “fixed tempo mode”) or follow the tempo track (this is called “tempo track mode”), which may contain tempo changes.

- To switch between fixed tempo mode and tempo track mode, use the Tempo button on the Transport panel:

When the Tempo button is lit (and the text “Track” is shown), the tempo follows the tempo track; when it is deactivated (and the text “Fixed” is shown), a fixed tempo is used. You can also switch the tempo mode with the Activate Tempo Track button on the Tempo Track Editor toolbar.

In tempo track mode, the tempo cannot be changed on the Transport panel, i.e. the tempo information here is for display purposes only.

Signature events are always active, regardless of whether fixed tempo mode or tempo track mode is selected.

RELATED LINKS

Defining the Track Time Base on page 156
Setting the fixed tempo on page 983

A note about tempo-based audio tracks

For tempo-based tracks, the start position of audio events on the timeline depends on the current tempo setting. However, it is important to realize that the actual audio ("within" the events) will play back as recorded, regardless of any tempo changes you make. Therefore, it is good practice to make the proper tempo and time signature settings before you start recording tempo-based audio.

- To make an already recorded audio track follow the tempo changes, you can use the Tempo Detection Panel or the Sample Editor.
- To adapt the tempo track to time-based material, you can use the Time Warp tool.

  This allows you to adjust the tempo track so that tempo-based material (e.g. positions in music) coincides with time-based material (positions in narration, video, etc.).

RELATED LINKS

Tempo Detection on page 996
Sample Editor on page 506
The Time Warp tool on page 989

Tempo and signature display

You can view the current tempo and signature settings of your project in a number of ways:

- On the Transport panel.
- By displaying the tempo track and the signature track in the Project window.

  Open the Project menu, select Add Track and the Signature and/or Tempo options.
- In the Tempo Track Editor.

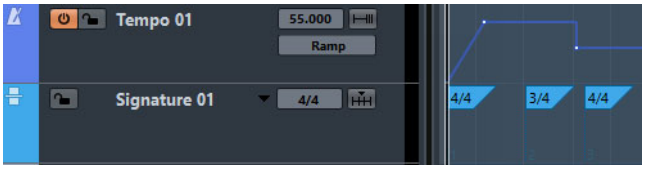
  Open the Project menu and select Tempo Track, or [Ctrl]/[Command]-click the Tempo button on the Transport panel.

RELATED LINKS

Transport Panel on page 220

About the tempo and signature tracks

The tempo track and the signature track allow you to view and edit tempo and signature data in the project context.



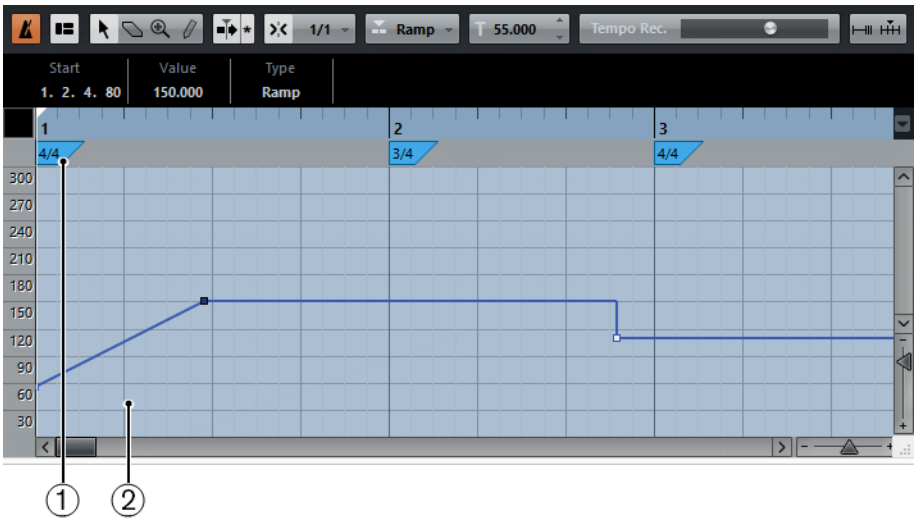
- The Inspectors for these tracks show the positions and values of individual tempo curve points or signature events.
- The signature track's background always shows bars.

  This is independent of the ruler display format setting.
- In the track list for the tempo track, on the far right, you can specify the display range by clicking on the numbers at the top or bottom and dragging up or down.

  Note that this does not change the tempo setting, but changes the display scale of the tempo track.
- You can lock the tempo track and the signature track to prevent unintentional editing.

  Simply click the lock symbols in the track list to lock/unlock the tracks.

About the Tempo Track Editor



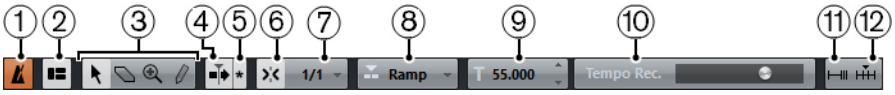
1) Time Signature area
2) Tempo curve display

If you do not want to display two extra tracks in the Project window, you can also open the Tempo Track Editor to view and edit tempo and signature information.

The Tempo Track Editor has a toolbar, info line, and ruler just like other editors in Nuendo, plus an area for the display of time signature events and a tempo curve display.

The toolbar

The toolbar contains various tools and settings:



1) Activate Tempo Track
2) Show Info
3) Tools
4) Auto-Scroll
5) Suspend Auto-Scroll when Editing
6) Snap on/off
7) Snap value
8) Curve type for new tempo events
9) The selected tempo
10) Tempo recording slider
11) Open Process Tempo dialog
12) Open Process Bars dialog

- The tools for Object Selection, Erase, Zoom and Draw are used in the same way as in other editors. The Snap and Auto-Scroll functions also work exactly like in the Project window.

  Note that in the Tempo Track Editor, the Snap function affects tempo events only. Time signature events always snap to the beginning of bars.

- The info line in the Tempo Track Editor allows you to change settings for selected time signature events, and the type and tempo of selected tempo curve points.

- The ruler in the Tempo Track Editor shows the timeline, and is similar to the ruler in the Project window.

- The area below the ruler shows time signature events.

- The main display shows the tempo curve (or, if fixed tempo mode is selected, the fixed tempo). To the left of the display you will find a tempo scale to help you quickly locate the desired tempo.

  Note that the vertical “grid lines” in the tempo curve display correspond to the display format selected for the ruler.

RELATED LINKS

Ruler on page 49
Setting the fixed tempo on page 983

Editing tempo and signature

You can use the options of the Tempo Track Editor or the tempo and signature tracks to edit tempo and signature settings. The descriptions given below are valid in both cases. The only exception is the tempo recording slider, which is available only in the Tempo Track Editor.

RELATED LINKS

Recording tempo changes on page 983

Editing the tempo curve

IMPORTANT

This section assumes that you are working in tempo track mode, i.e. the Tempo button must be activated on the Transport panel.

Adding tempo curve points

PROCEDURE

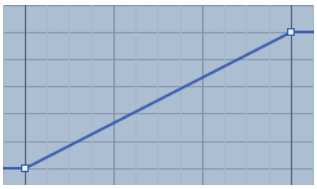
1. Use the “Type of New Tempo Points” pop-up menu (on the toolbar of the Tempo Track Editor) or the “Type of New Tempo points” pop-up menu in the track list for the tempo track to select whether you want the tempo to change gradually from the previous curve point to the new one (“Ramp”) or change instantly to the new value (“Jump”).

   You can also set this to Automatic. In this case, the types of existing tempo curve points will be used when inserting new points at the same position.

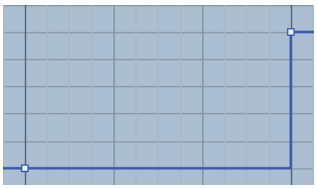
2. Select the Draw tool.

3. Click and drag in the tempo curve display to draw a tempo curve.

   When you click, the tempo display on the toolbar shows the tempo value. If Snap is activated on the toolbar, this determines at which time positions you can insert tempo curve points.



Type of New Tempo Points set to “Ramp”



Type of New Tempo Points set to “Jump”

You can also click on the tempo curve with the Object Selection tool.

This adds a single point with each click.

NOTE

Tempo values can also be automatically inserted by the Beat Calculator.

RELATED LINKS

The Beat Calculator on page 987
Snap Function on page 62

Selecting tempo curve points

Curve points can be selected as follows:

- Using the Object Selection tool.

  The standard selection techniques apply.

- Using the Select submenu of the Edit menu.

  The options are:

All

Selects all curve points on the tempo track.

None

Deselects all curve points.

Invert

Inverts the selection – all selected curve points are deselected and all curve points that were not selected are selected instead.

In Loop

Selects all curve points between the left and right locator.

From Start to Cursor

Selects all points to the left of the project cursor.

From Cursor to End

Selects all points to the right of the project cursor.

- You can also use the left and right arrow keys on the computer keyboard to go from one curve point to the next.

If you press [Shift] and use the arrow keys, you can select several points at the same time.

Editing tempo curve points

Curve points can be edited in the following ways:

- By clicking and dragging horizontally and/or vertically with the Object Selection tool.

  If several points are selected, all of them are moved. If Snap is activated on the toolbar, this determines to which time positions you can move curve points.

- By adjusting the tempo value in the tempo display on the Tempo Track Editor toolbar, in the Inspector, or on the info line.

NOTE

Selecting several points and changing the tempo value in the info line leads to a relative adjustment of the tempo values.

IMPORTANT

We recommend using the Bars+Beats display format when editing tempo curves. Otherwise, you may get confusing results. This is because moving a point will change the relationship between tempo and time. If you move a tempo point to the right and drop it at a certain time position, the mapping between tempo and time will be adjusted. Since you have changed the tempo curve, the moved point will appear at another position.

RELATED LINKS

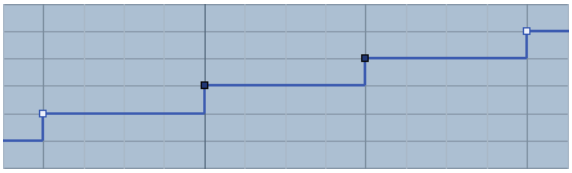
Snap Function on page 62

Adjusting the curve type

You can change the curve type of a tempo curve segment at any time, using the following method:

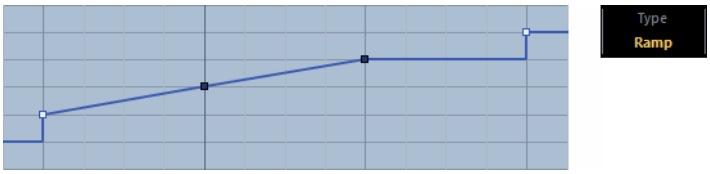
PROCEDURE

1. With the Object Selection tool, select all curve points within the segment you want to edit.



2. In the info line, click below the word “Type” to switch the curve type between “Jump” and “Ramp”.

   The curve sections between the selected points are adjusted.



Removing tempo curve points

To remove a curve point, either click on it with the Erase tool or select it and press [Backspace]. The first tempo curve point cannot be removed.

Recording tempo changes

The Tempo Recording slider on the toolbar of the Tempo Track Editor allows you to record tempo changes “on the fly”: simply start playback and use the slider to raise or lower the tempo at the desired positions. This is useful for creating natural sounding ritardandos, etc.

Setting the fixed tempo

When the tempo track is deactivated, the tempo track curve is grayed out (but still visible). Since the tempo is fixed throughout the whole project, there are no tempo curve points. Instead, the fixed tempo is displayed as a horizontal black line in the tempo curve display.

To set the tempo in fixed mode:

- Adjust the value numerically in the tempo display on the Tempo Track Editor toolbar or in the track list.
- On the Transport panel, click on the tempo value to select it, enter a new value and press [Enter].

Adding and editing time signature events

- To add a time signature event, click with the Draw tool in the time signature area or time signature track.

  This adds a default 4/4 time signature event at the closest bar position.

- To edit the value of a time signature event, select it and adjust the value on the info line, or double-click the event and enter a new value.

  Note that there are two controls for the signature display; the left one adjusts the numerator and the right one adjusts the denominator.

- To move a time signature event, click and drag it with the Object Selection tool.

  Note that you can [Shift]-click to select multiple events. Also note that time signature events can only be positioned at the start of bars. This is also true if Snap is deactivated.

- To remove a time signature, either click on it with the Erase tool or select it and press [Backspace] or [Delete].

  The first time signature event cannot be removed.

Exporting and importing tempo tracks

You can export the current tempo track for use in other projects by selecting "Tempo Track" from the "Export" submenu of the File menu. This allows you to save the tempo track information (including time signature events) as a special XML file (file extension ".smt").

To import a tempo track, select "Tempo Track" from the Import submenu of the File menu. Note that this replaces all tempo track data in the current project (although the operation can be undone if needed).

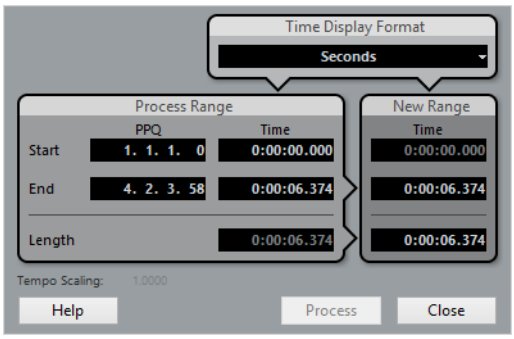
Process Tempo

Process Tempo allows you to define a specific length or end time for a set range, and the tempo track will automatically set a tempo that will fit the range in the specified time.

PROCEDURE

1. Specify a region or range that you wish to process by setting the left and right locators, either in the Tempo Track Editor or in the Project window.
2. Click on the Process Tempo button (either in the Tempo Track Editor or on the tempo track).

   The Process Tempo dialog opens.



3. In the Process Range fields, the specified range is shown, in Bars and Beats (PPQ) and in a time format, which can be selected from the Time Display Format pop-up menu.

   The range defined in step 1 will already be set, but you can edit the range by adjusting the values in the Process Range fields if you wish.

   Now you can either specify a new range length or a new range end time. What to choose depends on whether the range should have a specific length or whether it should end at a specific time position.

4. Enter the desired End or Length in the corresponding fields of the New Range section.

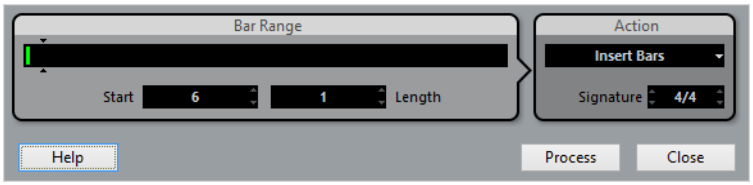
   You can select a time format for the new range in the Time Display Format pop-up menu.

5. Click Process.

   Now the tempo track is automatically adjusted, and the range will have the specified duration.

The Process Bars dialog

The Process Bars dialog (opened from the Tempo Track Editor or the signature track) uses the global “Insert Silence” and “Delete Time” functions from the Range submenu of the Edit menu. However, the necessary ranges (or parameters) are calculated using a musical “bars+beats-based” environment. The function also ensures that the time signatures stay “in sync” after these operations. This allows for a much more intuitive approach when inserting, deleting or replacing “time” while working with a project set to the Bars+Beats time type.



The dialog contains the following elements:

Bar Range

The Bar Range display shows the bar range within the project as well as its length. Click on the right edge of the green indicator and drag it to the right to enlarge the range. You can also use the Start and Length value fields (see below).

The arrow pair in this section marks the length of the current project. The area to the right marks the bar range that can be added (10,000 bars max.).

Bar Range – Start

This is where you specify the start position for the bar range. Click on the arrows to raise/lower the value or click directly in the value field to enter the value manually.

Bar Range – Length

This is where you specify the length of the bar range. Click on the arrows to raise/lower the value or click directly in the value field to enter the value manually.

Action – Insert Bars

When you select this action, clicking the Process button will insert the specified number of empty bars with the set time signature at the start position specified above.

Action – Delete Bars

When you select this action, clicking the Process button will delete the specified number of bars, beginning at the start position specified above.

Action – Reinterpret Bars

When you select this action, clicking the Process button will reinterpret the bar range to fit the specified time signature. This is very special in the sense that both bars+beats positions of the notes and the tempo are being changed to fit the new time signature, but the playback of the notes will stay just the same.

For example, if you want to reinterpret a bar with the time signature 3/4 so that it gets the time signature 4/4, quarter notes will become half note triplets. If you reinterpret a bar with the time signature 4/4 to attain 3/4, you will get quadruplets.

Action – Replace Bars

When you select this action, clicking the Process button will cause the time signature of the specified bar range to be replaced by the one you specify in this dialog.

Action – Signature

This lets you specify the time signature for the action you select on the Action pop-up menu (except for the Delete Bars action).

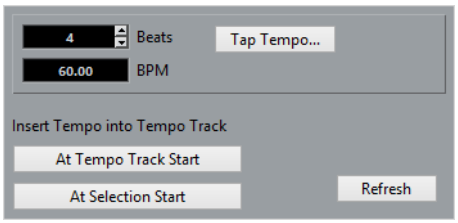
Process

Click on this button to apply your changes to the specified bar range.

Close

Clicking this button without clicking on “Process” first will close the dialog without applying your settings.

The Beat Calculator



The Beat Calculator is a tool for calculating the tempo of freely recorded audio or MIDI material. It also allows you to set the tempo by tapping.

Calculating the tempo of a recording

PROCEDURE

1. In the Project window, make a selection that covers an exact number of beats of the recording.
2. Select “Beat Calculator…” from the Project menu.

   The Beat Calculator window appears.
3. In the Beats field, enter the number of beats that the selection encompasses.

   The corresponding tempo is calculated and displayed in the BPM field.

   If you need to adjust the selection, you can go back to the Project window, leaving the Beat Calculator open.

   To re-calculate the tempo after adjusting the selection, click Refresh.
4. You can also insert the calculated tempo into the tempo track by clicking one of the buttons in the lower left corner of the Beat Calculator window.

   Clicking “At Tempo Track Start” will adjust the first tempo curve point, while “At Selection Start” will add a new tempo curve point at the selection’s start position, using the “Jump” curve type.

   IMPORTANT

   If fixed tempo mode is selected when you insert the calculated tempo, the fixed tempo will be adjusted, regardless of which button you click.

RELATED LINKS

Adding tempo curve points on page 980

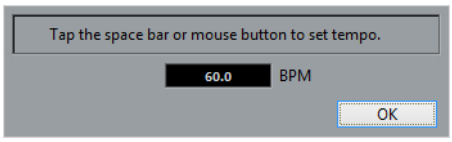
Using Tap Tempo

The Tap Tempo function allows you to specify a tempo by tapping:

PROCEDURE

1. Open the Beat Calculator.
2. If you want to tap the tempo to some recorded material, activate playback.
3. Click the Tap Tempo button.

   The Tap Tempo window appears.

4. Tap the tempo on the Spacebar of the computer keyboard or with the mouse button.

   The tempo display will update the calculated tempo between each tap.
5. Click OK to close the Tap Tempo dialog.

   The tapped tempo is now shown in the Beat Calculator's BPM display. You can insert it into the tempo track as described above.

Merge Tempo From Tapping

This function allows you to create a complete tempo track based on your tapping. Typically, you would use this if you have an audio file with no tempo mapping and want to be able to add other material afterwards, etc.

PROCEDURE

1. Create an empty time-based MIDI track and, while playing back your audio material, tap the new tempo on your MIDI keyboard and record the created notes onto the new MIDI track.

   Note that you must create note events – pedal events cannot be used for this function.
2. Play back the audio and check that the timing of the MIDI notes corresponds to that of the audio.

   If necessary, edit the MIDI notes in an editor.
3. Select the MIDI part (or the individual notes in an editor) that you want to use for the calculation.
4. Select "Merge Tempo From Tapping" from the Functions submenu of the MIDI menu.

   A dialog opens.
5. In the dialog, specify what type of note (1/2, 1/4, etc.) you tapped during the recording.

   If you activate the "Begin at Bar Start" option, the first note will automatically start at the beginning of a bar when calculating the new tempo curve.

6. Click OK.

   The project's tempo is adjusted to the tapped notes.

7. Open the Project menu and select "Tempo Track" to check that the new tempo information is reflected in the tempo curve.

   NOTE

   Another way of creating a tempo map for freely recorded audio would be to use the Time Warp tool, see below.

The Time Warp tool

The Time Warp tool lets you adjust the tempo track so that "musical time-based" material (positions related to the tempo) matches "linear time-based" material (positions in time). Some typical applications:

- When you have recorded music (audio or MIDI) without tempo reference or metronome click, the Time Warp tool can be used for creating a tempo map that fits the recording (allowing you to rearrange or add other material).
- When you are creating music for a movie and want to match certain positions in the video with certain positions in the music.

The Time Warp tool makes use of the fact that tracks can be based on time positions (linear time base) or positions related to tempo (musical time base).

RELATED LINKS

Defining the Track Time Base on page 156

Basic procedure

You use the Time Warp tool to drag a musical position (a position in bars+beats format) to a certain position in time. This can be done in the Project window or in an editor, as described below. Here is the general procedure:

PROCEDURE

1. Make sure tempo track mode is active.

   You cannot use the Time Warp tool in fixed tempo mode.

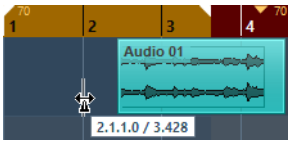
2. Select the Time Warp tool.

   Bars+Beats format is automatically selected for the ruler in the active window, and the ruler is shown in brown.

3. Click in the window at a musical position and drag it so that it matches a position in the material you are editing – e.g. the start of an event, a certain "hit" within an audio event, a frame in a video clip, etc.

   When you click with the Time Warp tool, it snaps to the grid in the window.



Dragging the start of the bar to the start of the audio event.

While you are dragging, the track(s) you are editing are temporarily switched to linear time base. This means that the contents of the tracks remain at the same time positions regardless of the tempo (there is an exception to this in the Project window, see below).

4. When you release the mouse button, the musical position you clicked on matches the time position you dragged it to.

   This is because the Time Warp tool changed the last tempo event on the tempo track (and/or added new ones, depending on window and usage), thereby scaling the tempo track to fit.

Rules

- When you use the Time Warp tool, the tempo value of the last tempo event (before the click position) is adjusted.
- If later tempo events exist, a new tempo event will be created at the click position. This way, the later tempo event(s) will not be moved.
- When you click with the Time Warp tool, it snaps to the tempo grid in the window.
- When you drag the tempo grid to a new position, it can be magnetic to events in the window.

  In the Project window, this requires that Snap is activated and “Events” is selected on the Snap Type pop-up menu – the grid will then snap to the start and end of events or parts, and to markers. In the Sample Editor, this requires that Snap is activated – the grid will then snap to hitpoints (if any). In the MIDI editors, this requires that Snap is activated – the grid will then snap to the start and end of notes.
- The function will create tempo values up to 300 bpm.

Viewing and adjusting tempo events

When you select the Time Warp tool, the ruler of the active window is shown in brown. Existing tempo events are shown in the ruler as “flags” with the tempo values displayed.

This helps you see what's going on, but you can also use this for editing the tempo track:

- If you press the create/erase modifier key (by default [Shift]) and click on a tempo event in the ruler, it is deleted.

  [Shift] is the default modifier for this – you can adjust this in the Preferences dialog (Editing–Tool Modifiers page).

- You can click on a tempo event in the ruler and drag to move it.

  This automatically edits the tempo value in the event so that elements to the right keep their positions.

- If you press [Alt]/[Option] and move (or delete) a tempo event in the ruler, the tempo value is not adjusted – this means elements to the right will be moved.

  This is the default modifier key for this – you can adjust it in the Preferences dialog (Editing–Tool Modifiers page).

Using the Time Warp tool in the Project window

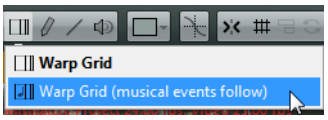
In the Project window, there are two modes for the Time Warp tool. To select the desired option, click on the Time Warp tool and click again to open a context menu. The available options are:

- Warp Grid

  This is the default mode. If you use it, all tracks are temporarily switched to linear time base. This means that all tracks will keep their absolute time positions when you adjust the tempo track.

- Warp Grid (musical events follow)

  If you use this mode, no tracks are switched to linear time base. This means that all tracks that are not set to linear time base will follow the changes you make to the tempo track.



Matching a musical score to video

Here's an example of how to use the Time Warp tool in "musical events follow" mode. Let's say you are creating the music for a film. You have a video track, an audio track with a commentary and some audio and/or MIDI tracks with your music. Now you want to match the position of a musical cue to a position in a video film. The musical cue is located in bar 33. There are no tempo changes in the project (yet).

PROCEDURE

1. Make sure tempo track mode is selected on the Transport panel.
2. Now you need to locate the position in the video. If you do not need very high precision, you can simply locate it by looking at the thumbnails on the video track – otherwise you can pinpoint the exact position and add a marker to the marker track (to which you can snap later).

   You can also make a note of the exact position and add an extra ruler track set to show the timecode.
3. Make sure that the correct tracks are set to linear time base or musical time base, respectively.

   In our example, we want the video track and the audio track with a commentary voice-over to be linear time-based (as well as the marker track, if used). All other tracks should be set to musical time base. You change this by clicking the time base button in the track list or Inspector.

   Musical time base selected

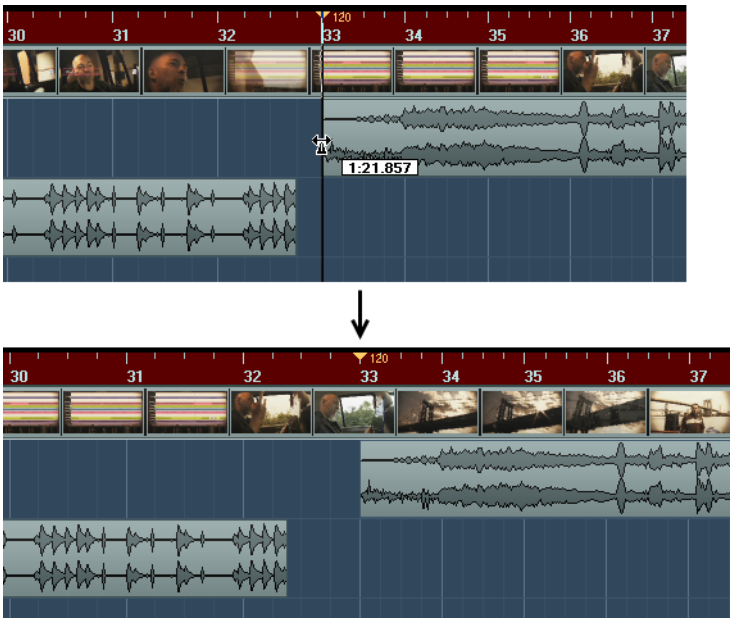
   Linear time base selected
4. Set up the Grid Type pop-up menu as desired.

   When you click with the Time Warp tool, it snaps to the selected grid. In this case, you will find the musical cue at the start of bar 33, so we can set the grid to "Bar".

   Note that this affects the snapping to the ruler (tempo grid) when you click! In addition, the tool can be "magnetic" to events in the Project window when you drag – for this, you need to activate the Snap function, open the Snap Type pop-up menu, and select "Events".

   In our example, this would be useful if you created a marker at the desired position in the video – when you drag the grid (see below), it will snap to the marker.
5. Click on the Time Warp button and click again to open a pop-up menu.
6. Select the "Warp Grid (musical events follow)" mode.
7. Click in the event display at the start of bar 33 and drag to the desired position in the video.

   As mentioned above, this can mean dragging to a position indicated by the thumbnails on the video track, to a marker on the marker track or to a time position on an additional ruler track.



When you drag, the ruler is scaled – and the music tracks will follow.

8. Release the mouse button.

   If you look in the ruler at the beginning of the project, you will see that the first (and only) tempo event has been adjusted.

9. Try playing back.

   The musical cue should now happen at the correct position in the video.

   Let's say you need to match another cue to another position later on in the video. If you simply repeat this procedure, you will find that the first cue gets out of sync – since you are still changing the first (and only) tempo event on the tempo track!

   You need to create a "lock point" – a tempo event at the first cue position:

10. Press [Shift] and click with the Time Warp tool in the event display at the cue position.

    In our case, this is bar 33.

    A tempo event (with the same value as the first one) is added at that position.

11. Now match the second musical cue to the correct video position by dragging the musical position to the desired time position as before.

    The new tempo event is edited – the first tempo event is unaffected and the original cue is still matched.

    If you know you are going to match several cues this way, make it a habit to press [Shift] each time you use the Time Warp tool to match positions.

    This adds a new tempo event – that way, you do not have to add tempo events afterwards as described above.

About snapping

If Snap is activated in the Project window and "Events" is selected on the Snap Type pop-up menu, the Time Warp tool will be magnetic to events when you drag the tempo grid. This makes it easier to snap a tempo position to a marker, the start or end of an audio event, etc.

Using the Time Warp tool in an audio editor

Using the Time Warp tool in the Sample Editor or Audio Part Editor is different from using it in the Project window, in the following ways:

- When you use the Time Warp tool, a tempo event is automatically inserted at the beginning of the edited event or part. This tempo event will be adjusted when you warp the tempo grid with the tool.

  This means that material before the edited events will not be affected.

- Only the default mode for the Time Warp tool is available.

  This means that when you use the tool, the edited track is temporarily switched to linear time base.

Making a tempo map for a “free” recording

The following example shows how to use the Time Warp tool in the Sample Editor to create a tempo map matching freely recorded music. Let’s say you have recorded a drummer, playing without a metronome – this typically means the tempo varies ever so slightly. To be able to add more material and easily rearrange the recorded audio, you want the tempo in Nuendo to match the recorded drum track:

PROCEDURE

1. If necessary, move the recorded event.

   Move it so that the first downbeat (“one”) happens at the start of the bar – zoom in if needed.

2. Open the drum recording in the Sample Editor and make sure Hitpoint mode is not selected.

   The Time Warp tool cannot be used in Hitpoint mode. However, if you have calculated hitpoints already, these will be visible when the Time Warp tool is selected (see below).

3. Set the zoom so that you can see the individual drum hits clearly.

   To achieve this type of “visual” beat matching, it is important to have a fairly clean recording, such as the drum track in this example.

4. Select the Time Warp tool.

   You have already matched the first downbeat with the start of a bar. However, if the recording starts before the first downbeat (with a fill, some silence, etc.), you want to “lock” the first downbeat so that it stays in position:

5. Press [Shift] and click in the event at the position of the first downbeat (the start of the bar).

   When you press [Shift], the pointer turns into a pencil. Clicking adds a tempo event at the first downbeat – when you later adjust the tempo with the Time Warp tool, the first downbeat will stay in place. Note that if the event starts exactly on the first downbeat (no audio before the “one”), you do not need to do this. This is because a tempo event is automatically added at the start of the edited event.

6. Now, locate the start of the next bar in the ruler.

7. Click at that position in the event display and drag to the downbeat of the second bar in the recording.

   When you click, the pointer will snap to the ruler grid.

   By dragging the grid, you changed the tempo value in the tempo event at the first downbeat. If the drummer held a fairly consistent tempo, the following bars should now match pretty well, too.

8. Check the following bars and locate the first position where the audio drifts from the tempo.

   Now, if you simply adjusted that beat in the tempo grid to match the beat in the recording, the tempo event at the first downbeat would be changed – this would ruin the match in the previous bars! We need to lock these by inserting a new tempo event.

9. Locate the last beat that is in sync.

   This would be the beat just before the position where the audio and tempo drift apart.

10. Press [Shift] and click at that position to insert a tempo event there.

    This locks this matched position. The material to the left will not be affected when you make adjustments further along.

11. Now match the tempo grid to the next (unmatched) beat by clicking and dragging with the Time Warp tool.

    The tempo event you inserted in step 10 will be adjusted.

12. Work your way through the recording this way – when you find that the recording drifts from the tempo, repeat steps 9 to 11 above.

    Now the tempo track follows the recording and you can add more material, rearrange the recording, etc.

Matching to hitpoints

If you have calculated hitpoints for the audio event you are editing, these will be shown when the Time Warp tool is selected.

- The number of hitpoints shown depends on the Hitpoint Sensitivity slider setting you have made in Hitpoint mode.
- If you activate the Snap to Zero Crossing button on the toolbar, the Time Warp tool will snap to hitpoints when you drag the tempo grid.
- You can use the Create Markers from Hitpoints function (on the Hitpoints submenu of the Audio menu) to create markers at the hitpoint positions. This can be useful when using the Time Warp tool in the Project window, as the tool will be magnetic to markers (if the Snap Type is set to Events).

Using the Time Warp tool in a MIDI editor

This is very similar to using the tool in an audio editor:

- When you use the Time Warp tool, a tempo event is automatically inserted at the beginning of the edited part – this tempo event will be adjusted when you warp the tempo grid with the tool. Material before the edited part will not be affected.
- Only the default mode for the Time Warp tool is available. So when you use the tool, the edited MIDI track is temporarily switched to linear time base.
- The rulers in the MIDI editors can be set to “Time Linear” or “Bars+Beats Linear” mode – the Time Warp tool requires Time Linear mode. If necessary, the ruler mode will be switched when you select the Time Warp tool.
- If Snap is activated on the toolbar in the MIDI editor, the tool will snap to the start and end of MIDI notes when you drag the tempo grid.

Typically, you would use the Time Warp tool in a MIDI editor to match the Nuendo tempo to freely recorded MIDI material (much like the audio example above).

RELATED LINKS

Changing the Display Format for the Ruler on page 779

Tempo Detection

Nuendo offers a powerful tempo detection algorithm that can be used on any rhythmic musical content, even if it has not been recorded to a metronome click and/or contains tempo drift. This feature serves two main purposes:

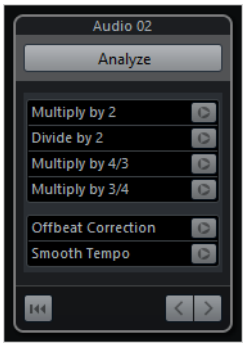
- Analyzing the tempo of freely recorded material so that other (audio or MIDI) tracks can follow this tempo.
- Adjusting freely recorded material to the project tempo, which can be fixed or variable.

Requirements

- The audio event or MIDI part has to be at least 7 seconds long.
- The material must have discernible beats or rhythms.
- Audio events must be set to musical mode.

The Tempo Detection Panel

The Tempo Detection Panel contains the functions for analyzing the tempo of an audio event or MIDI part. It is opened via the Project menu.



In the top section of the panel, the name of the selected event or part is shown. Below the name, the Analyze button is located. Click this button to start the tempo detection.

The middle section contains several functions for correcting and fine-tuning the detected tempo curve.

The arrow buttons at the bottom right let you change the direction in which the algorithm will analyze the material during a manual correction operation. To work backwards, i.e. to reanalyze the beginning of the tempo curve, activate the left arrow button.

With the Reset button at the bottom left you can delete the complete analysis data and start again from scratch.

NOTE

The Tempo Detection Panel has to be opened specifically for the material that you want to analyze.

RELATED LINKS

Correcting and fine-tuning the detected tempo map on page 998
The beginning of the tempo curve needs to be corrected on page 999

Detecting the basic tempo of an audio event/MIDI part

PROCEDURE

1. In the Project window, select the audio event/MIDI part that you want to analyze.
2. On the Project menu, select “Tempo Detection…”.

   The Tempo Detection Panel opens.
3. Click the Analyze button.

RESULT

- A rough tempo map based on the beat analysis is created for the selected audio clip.
- A tempo and a signature track are added to the project.
- The project will get a 1/4 signature, because the tempo detection only calculates a tempo based on beats, regardless of a musical signature. The signature can be modified later.
- The Time Warp Tool is selected for fine-tuning or adjusting the newly generated tempo map.

Depending on the rhythmic quality of the source material, the tempo analysis may directly lead to a perfect result. However, if this is not the case, you can apply the correction and fine-tuning functions. To find out whether such actions are necessary, activate the metronome click and play back the project.

Correcting and fine-tuning the detected tempo map

If the metronome click does not match the material perfectly, perform any of the following operations, depending on the situation.

The detected tempo is too fast or too slow

- To double or halve the detected tempo, use the “Multiply by 2” and “Divide by 2” buttons.
- To adjust the detected tempo with a factor of 3/4 or 4/3, use the “Multiply by 4/3” and “Multiply by 3/4” buttons.

Examples:

- If your material is twice as fast as the detected tempo, you can apply the “Multiply by 2” function.
- If your material contains dotted notes or triplets and the algorithm detects 3 beats where 4 are expected, you can apply the 4/3 conversion.
- If the actual signature is 2/4 and the algorithm detected 6/8 beats or vice versa, you can apply a 3/4 conversion combined with the “Multiply by 2” function.

The detected tempo has jumps and spikes although it should be steady

If you get the message that the algorithm has detected irregular tempo changes, even though you know that the material has a more or less steady tempo, you can use the “Smooth Tempo” function.

- To retrigger the tempo analysis based on the assumption that the material has a steady tempo, click the “Smooth Tempo” button.

  Irregular spikes or tempo changes are removed during this analysis.

The detected tempo is off by half a beat

In some cases, the offbeat of a rhythm might be dominant enough to confuse the beat detection algorithm resulting in an offset. In that case it is necessary to shift the tempo events.

- To shift the detected tempo events by half a beat, click the “Offbeat Correction” button.

The tempo was not detected properly for the whole event/part

Sometimes it is impossible for the algorithm to properly detect the tempo for the whole audio event/MIDI part because it contains sections played in a different tempo or has special rhythmic characteristics. Manual adjustments are then necessary to create a perfect tempo track.

To manually correct tempo events, proceed as follows:

PROCEDURE

1. With the Tempo Detection Panel still open, play the track from the beginning and listen to the click.

   It is useful to zoom in on the waveform so that the transients are visible. Using the stationary cursor could be useful as well.

2. Locate the first tempo event that is off. Use the Time Warp Tool to move this tempo event to the correct position.

   The material to the right of the corrected event or part will be reanalyzed and the tempo recalculated.

3. Continue listening to the audio or MIDI until you reach the next misplaced tempo event and repeat the manual correction procedure until you reach the end of the song.

The beginning of the tempo curve needs to be corrected

When you edit a tempo event, the tempo curve by default is reanalyzed from the point of editing towards the right. However, if the detection did not produce proper results at the beginning of the event or part, you can change the direction in which the algorithm works.

PROCEDURE

1. At the bottom of the Tempo Detection Panel, activate the left arrow button to change the direction of reanalysis.

2. Locate the first correct tempo event at the beginning of the audio/MIDI and use the Time Warp tool to move the corresponding tempo event slightly back and forth to trigger a backwards detection.

   The tempo at the beginning of the audio event/MIDI part is corrected and new tempo events are added where necessary.

The material contains sections with different tempos

In some cases, a track may include multiple sections with different tempo and the tempo detection might stop at the position of a tempo change or pause.

If the manual adjustment of individual tempo events does not give you the desired results for files with varying tempo, you can cut them at each major tempo change and perform the tempo detection for each of the resulting sections independently.

NOTE

Remember that each cut needs to have a length of at least 7 seconds.

Finishing

Once the tempo map is correct, close the Tempo Detection Panel. You can now set up signature events with the correct time signature.

Adjusting the audio to the project tempo

If you want freely recorded audio to follow a fixed tempo or a different project tempo, you can use the Set Definition From Tempo dialog to save the tempo information from the tempo track in the corresponding audio clips.

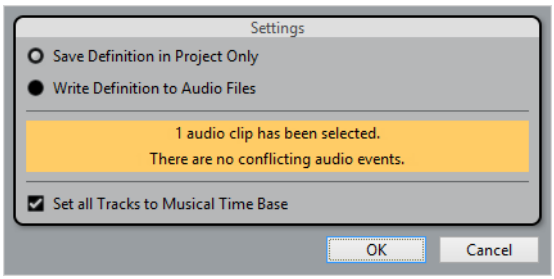
PROCEDURE

1. Select the audio events that you want to have follow the project tempo.

   For example, this could be the individual tracks in a multi-track drum session.

2. On the Audio menu, open the Advanced submenu and select the “Set Definition From Tempo…” option.

   The Set Definition From Tempo dialog opens.



3. Select whether you want to save the tempo information in the project file only or in the selected audio clips.

   Writing the definition into the audio files allows you to use these in other projects, complete with tempo information.

4. Select if you want to set all tracks to musical time base.

   If you do not activate this option, only the tracks containing the selected events are set to musical time base.

5. Click OK.

   The tempo information is now copied into the selected audio clips and the tracks are set to musical time base. Furthermore, Musical Mode is activated for the audio events.

   IMPORTANT

   If you have placed audio events referring to the same audio clip at different positions on the timeline and you apply the “Set Definition From Tempo” function simultaneously to these events, new audio files are written for all the events except the first.

RESULT

The audio tracks will now follow any tempo changes in the project. Therefore, you can disable the tempo track and set a fixed tempo for your project or edit the tempo track for a new tempo map.

Warping is applied to the events to match the tempo. By default, the “élastique Pro Time” time shifting algorithm is applied, which should lead to the best-quality results.

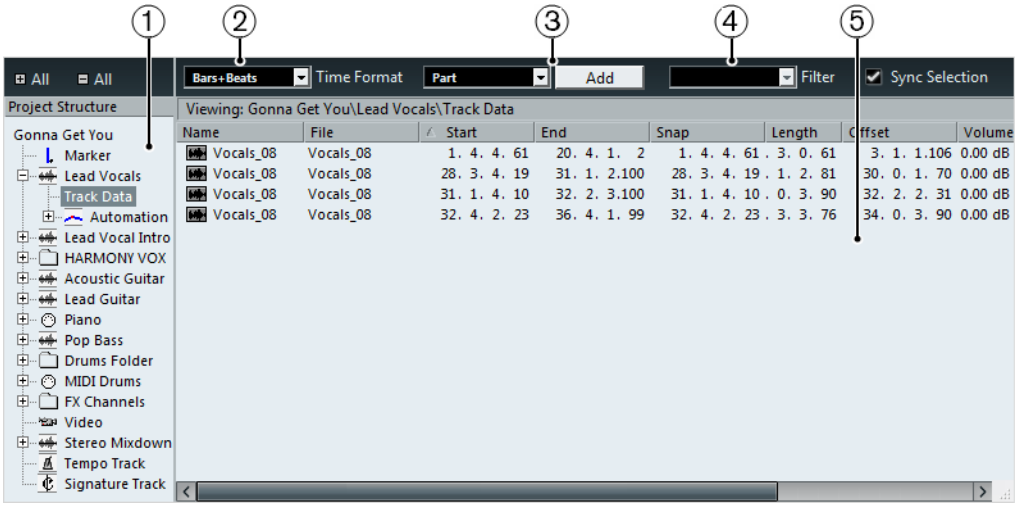
RELATED LINKS

About time stretch and pitch shift algorithms on page 502

Project Browser

Window Overview

The Project Browser window provides a list based representation of the project. This allows you to view and edit all events on all tracks by using regular value editing in a list.



1) Project Structure list
2) Time Format pop-up menu
3) Add pop-up menu and Add button
4) Filter pop-up menu
5) Event display

Opening the Project Browser

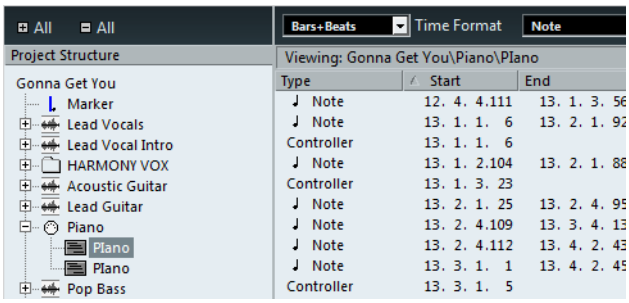
You open the Project Browser by selecting “Browser” from the Project menu. The Browser window can be open while you are working in other windows; any changes made in the Project window or an editor are immediately reflected in the Project Browser and vice versa.

Navigating in the Browser

You use the Project Browser much like you use the Windows Explorer/Mac OS Finder for browsing folders on your hard disk.

- Click on an item in the Project Structure list to select it for viewing.

  The contents of the item are shown in the event display.



- Items with hierarchical substructures can be folded out by clicking the "+" symbols or the "closed folder" symbols in the Project Structure list.

  When the substructure of an item is revealed, a "-" symbol or an "open folder" symbol is shown instead – click this to hide the substructure.

- To reveal or hide all substructures in the Project Structure list, use the buttons "(+) All" and "(–) All" above the list.

- The actual editing is done in the event display, using regular value editing techniques.

  There is one exception: You can rename items in the Project Structure list by clicking on a selected name and typing.

Customizing the view

You can drag the divider between the Project Structure list and the event display.

Furthermore, the event display can be customized in the following ways:

- You can change the order of the columns by dragging the column headings to the left or right.

- To select a display format for all position and length values, use the Time Format pop-up menu.

- You can sort events in the display by columns, by clicking the column heading.

  For example, if you want to sort events by their start positions, click that column heading. An arrow appears in the column heading, indicating that events are sorted by that column. The direction of the arrow indicates whether the events are sorted in ascending or descending order. To change the direction, click the column heading again.

Importing files via the MediaBay

You can also import audio, video and MIDI files into the Project Browser via the MediaBay using drag and drop.

NOTE

You can only import into existing tracks. This means, for example, that a video track has to exist in the Project window prior to importing a video file in the Project Browser.

RELATED LINKS

MediaBay on page 598

About the Sync Selection option

If the “Sync Selection” checkbox is activated (on the Project Browser toolbar), selecting an event in the Project window automatically selects it in the Project Browser, and vice versa. This makes it easy to locate events in the two windows.

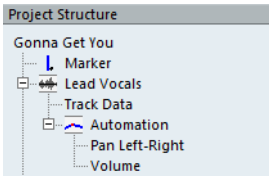
Editing tracks

Editing audio tracks

Audio tracks can have two “subitems”: Track Data and Automation.

- The Automation item corresponds to the automation track in the Project window, and contains the track’s automation events.
- The Track Data item corresponds to the actual audio track in the Project window. It contains audio events and/or audio parts, which in turn can contain audio events.

Note that if you have not performed any automation or opened an automation track, the Browser will only contain the audio data.



RELATED LINKS

Editing automation tracks on page 1010

The list columns for audio events

Name

Allows you to change the name of the event. Double-clicking the waveform image to the left of it opens the event in the Sample Editor.

File

The name of the audio file referenced by the event's audio clip.

Start

The start position of the event. If the event belongs to an audio part, you cannot move it outside the part.

End

The end position of the event.

Snap

The absolute position of the event's snap point. Note that adjusting this value will not change the position of the snap point within the event – instead it is another way of moving the event!

Length

The length of the event.

Offset

This determines "where in the audio clip" the event starts. Adjusting this value is the same as sliding the contents of the event in the Project window.

You can only specify positive Offset values, because the event cannot start before the start of the clip. Likewise, it cannot end after the end of the clip. If the event already plays the whole clip, the Offset cannot be adjusted at all.

Volume

The volume of the event, as set with the Volume handle or on the info line in the Project window.

Fade In/Fade Out

The length of the fade-in and fade-out areas respectively. If you use these settings to add a fade (where there previously was none), a linear fade will be created. If you adjust the length of an existing fade, the previous fade shape will be maintained.

Mute

Click in this column to mute or unmute the event.

Image

Displays a waveform image of the event inside a gray box corresponding to the clip. The image is scaled according to the width of the column.

The list columns for audio parts

Name

The name of the part. Double-clicking on the part symbol to the left of it opens the part in the Audio Part Editor.

Start

The start position of the part. Editing this value is the same as moving the part in the Project window.

End

The end position of the part. Editing this value is the same as resizing the part in the Project window.

Length

The length of the part. Editing this value is the same as resizing the part in the Project window.

Offset

This adjusts the start position of the events within the part. Adjusting this value is the same as sliding the contents of the part in the Project window.

Setting a positive Offset value is the same as sliding the contents to the left, while a negative Offset corresponds to sliding the contents to the right.

Mute

Click in this column to mute or unmute the part.

Creating audio parts

When the “Audio” item of an audio track is selected in the Project Structure list, you can create empty audio parts on the track by clicking the Add button on the toolbar. This will insert a part between the left and right locator.

Editing MIDI tracks

Just like audio tracks, MIDI tracks can have two “subitems”: Track Data and Automation.

- The Track Data item corresponds to the actual MIDI track in the Project window and can contain MIDI parts (which in turn can contain MIDI events).
- The Automation item corresponds to the automation track in the Project window, and contains the track’s automation events.

NOTE

If you have not performed any automation or opened an automation track, the Browser will only contain the MIDI data.

When editing the Track Data, the following parameters are available:

The list columns for MIDI events

Type

The type of MIDI event. This cannot be changed.

Start

The position of the event. Editing this value is the same as moving the event.

End

This is only used for note events, allowing you to view and edit the end position of a note (thereby resizing it).

Length

This is only used for note events. It shows the length of the note – changing this resizes the note and automatically changes the End value as well.

Data 1

The property of this value depends on the type of MIDI event:

- For notes, this is the note number (pitch). This is displayed and edited as a note name and an octave number, with the values ranging between C-2 and G8.
- For controller events, this is the type of controller, displayed in words. Note that you can edit this by entering a number – the corresponding controller type is automatically displayed.
- For pitchbend events, this is the fine adjustment of the bend amount.
- For poly pressure events, this is the note number (pitch).
- For VST 3 events, this is the event parameter (e.g. Volume).
- For other event types, this is the value of the event.

Data 2

The property of this value depends on the type of MIDI event:

- For notes, this is the note-on velocity.
- For controller events, this is the value of the event.
- For pitchbend events, this is the coarse bend amount.
- For poly pressure events, this is the amount of pressure.
- For VST 3 events, this is the value of the event parameter, with a range of 0.0 to 1.0.
- For other event types, this is not used.

Channel

The event's MIDI channel.

Comment

This column is used for some event types only, providing an additional comment about the event.

The list columns for MIDI parts

Name

The name of the part.

Start

The start position of the part. Editing this value is the same as moving the part.

End

The end position of the part. Changing this is the same as resizing the part (and will automatically affect the Length value as well).

Length

The length of the part. Changing this resizes the part and automatically changes the End value.

Offset

This adjusts the start position of the events within the part. Adjusting this value is the same as sliding the contents of the part in the Project window.

Setting a positive Offset value is the same as sliding the contents to the left, while a negative Offset corresponds to sliding the contents to the right.

Mute

Click in this column to mute or unmute the part.

NOTE

For SysEx (system exclusive) events, you can only edit the position (Start) in the list. However, clicking the Comment column opens the SysEx Editor, in which you can perform detailed editing of system exclusive events.

RELATED LINKS

Editing automation tracks on page 1010
SysEx Messages on page 849

Editing Note Expression data in the Project Browser (NEK only)

In the Project Browser, you can view and edit the MIDI controller events or VST 3 events of a MIDI note with Note Expression data.

To view and edit the Note Expression data content of a MIDI note, proceed as follows:

PROCEDURE

1. In the Project Structure list, select the Note Expression subitem of the MIDI note that you want to view or edit.

   In the event display, all MIDI controllers or VST 3 events within the Note Expression data are listed.

2. In the event display, view and edit the parameter values.

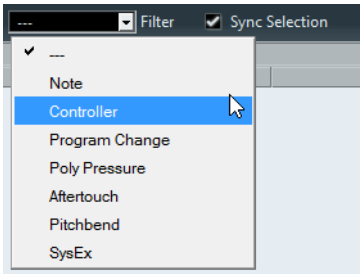
   This allows you to move an event by entering a different Start value, for example. You can also delete single events to “thin out” the Note Expression data content by selecting them and pressing [Delete].

RELATED LINKS

Note Expression (NEK only) on page 868

Filtering MIDI events

When you are editing MIDI in the Project Browser, the large number of different MIDI events displayed can make it hard to find the events you want to edit. The Filter pop-up menu allows you to select a single event type for display.



When this option is selected, only Controller events will be shown in the event display. To show all event types, select the top item (“---”) from the menu.

Creating MIDI parts

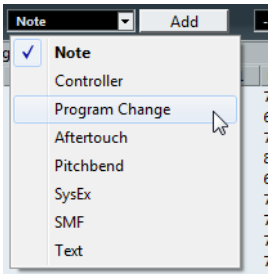
When a MIDI track is selected in the Project Structure list, you can create empty MIDI parts on the track by clicking the Add button. This will insert a part between the left and right locator.

Creating MIDI events

You can use the Project Browser to create new MIDI events.

PROCEDURE

1. Select a MIDI part in the Project Structure list.
2. Move the project cursor to the desired position for the new event.
3. Use the Add pop-up menu above the event display to select which type of MIDI event to add.



4. Click the Add button.

   An event of the selected type is added to the part, at the project cursor position. If the cursor is outside the selected part, the event is added at the beginning of the part.

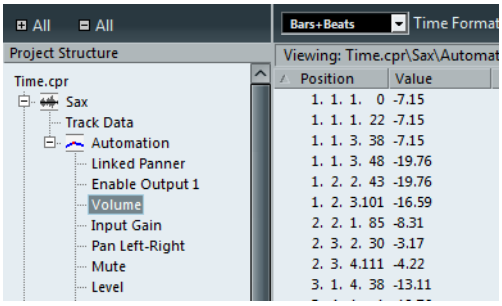
   NOTE

   NEK only: It is not possible to add MIDI controller events or VST 3 events to Note Expression data.

Editing automation tracks

All kinds of Nuendo automation (the automation tracks for MIDI, instrument, audio, group, and FX channel tracks, or the individual automation tracks for VST instruments, ReWire channels, or input and output busses) are handled in the same way in the Project Browser.

Each Automation item in the Project Structure list will have a number of subentries, one for each automated parameter. Selecting one of these parameters in the Project Structure list shows its automation events in the list:



You can use the two columns in the list to edit the position of the events and their values.

Editing the video track

When the video track is selected in the Project Structure list, the event display lists the video events on the track, with the following parameters:

Name

The name of the video clip that the event refers to.

Start

The start position of the event. Editing this value is the same as moving the event.

End

The end position of the event. Editing this value is the same as resizing the event, and will automatically change the Length value as well.

Length

The length of the event. Editing this value is the same as resizing the event, and will automatically change the End value as well.

Offset

This determines “where in the video clip” the event starts.

Note that the event cannot start before the start of the clip, or end after the end of the clip. Thus, if the event already plays the whole video clip, the Offset cannot be adjusted at all.

Editing marker tracks

Marker events have the following parameters:

Name

The name of the marker. This can be edited for all markers except the left and right locator.

Start

The position of “regular” markers or the start position of cycle markers.

End

The end positions of cycle markers. Editing this value is the same as resizing the cycle marker, and will automatically change the Length value as well.

Length

The length of cycle markers. Editing this value is the same as resizing the marker, and will automatically change the End value as well.

ID

The number of the marker. For regular (non-cycle) markers, this corresponds to the key commands used for navigating to the markers. For example, if a marker has ID 3, pressing [Shift]-[3] on the computer keyboard will move the song position to that marker. By editing these values, you can assign the most important markers to key commands.

Note that you cannot edit the “L” and “R” marker IDs (left and right locator) or assign IDs 1 and 2 to markers (since these are reserved for the locators).

You can insert markers on the selected marker track by selecting “Marker” or “Cycle Marker” from the Add pop-up menu and clicking the Add button. Regular markers will be added at the current project cursor position while cycle markers will be added between the current left and right locator positions.

NOTE

The Project Browser only displays the default attributes.

RELATED LINKS

Using Markers to Select Ranges on page 327

Editing the tempo track

When the tempo track is selected in the Project Structure list, the event display shows the events on the tempo track, with the following parameters:

Position

The position of the tempo event. You cannot move the first event on the tempo track.

Tempo

The tempo value of the event.

Type

This indicates whether the tempo jumps to the value of the event (“Jump” type) or whether it changes gradually from the previous tempo event, creating a ramp (“Ramp” type).

You can add new tempo events by clicking the Add button. This creates a jump-type event with the value 120 bpm at the project cursor position. Make sure that there is no other tempo event at the current cursor position.

RELATED LINKS

Editing the tempo curve on page 980

Editing time signatures

When “Signature track” is selected in the Project Structure list, the event display shows the time signature events in the project:

Position

The position of the event. Note that you cannot move the first time signature event.

Signature

The value (time signature) of the event.

You can add new time signature events by clicking the Add button. This creates a 4/4 event, at the beginning of the bar closest to the project cursor position. Make sure that there is no other time signature event at the current cursor position.

Deleting events

The procedure for deleting events is the same for all different track types:

PROCEDURE

1. Click on an event (or a part) in the Event display to select it.
2. Select Delete from the Edit menu or press [Delete] or [Backspace].

   IMPORTANT

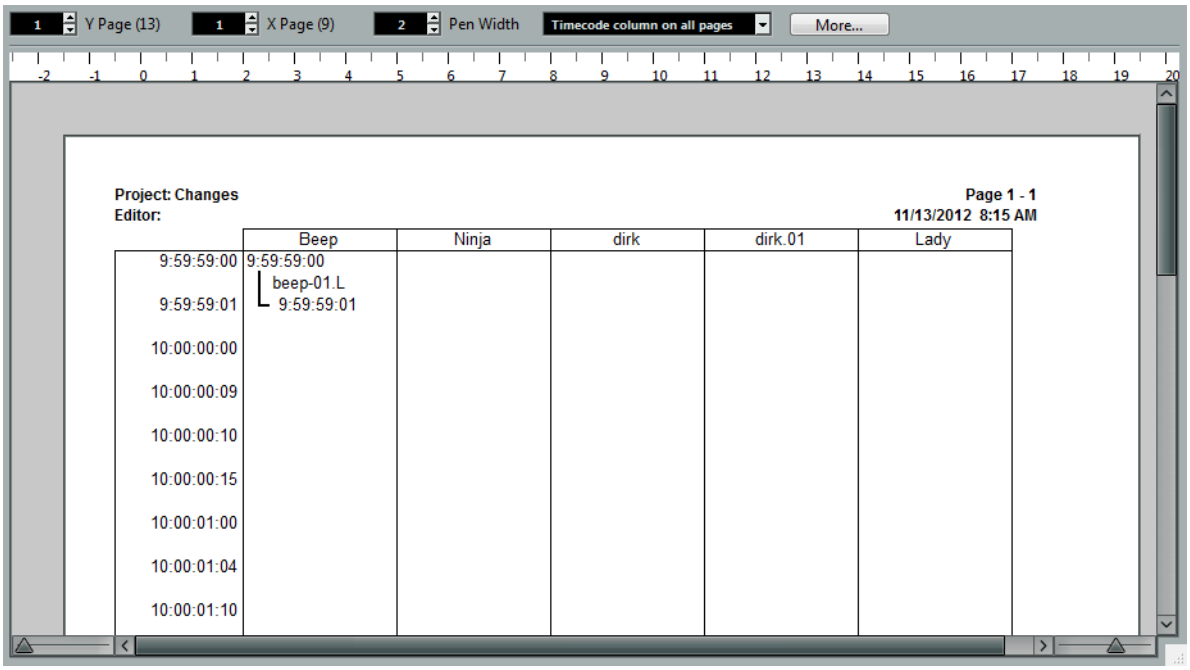
   Note that you cannot delete the first tempo event or the first time signature event.

Track Sheet

Overview

The track sheet provides a text-form “flow-chart” representation of the Project. It lists all audio (and video) tracks and their contents, and can easily be printed out.

To open the Track Sheet window, select “Track Sheet” from the Project menu.



The actual track sheet is displayed in the lower part of the window. It contains the following items:

- The leftmost time column contains a list of time positions in the display format selected in the Project Setup dialog.

  The time positions relate to start and end times of audio or video events or parts on the tracks.

- The following columns display the tracks in the order they appear in the track list.

  Only audio and video tracks are shown.

- The events are listed in their corresponding track columns in the order they appear (starting at the top).

- For each event, the start and end times are shown, with a vertical line binding the two together.

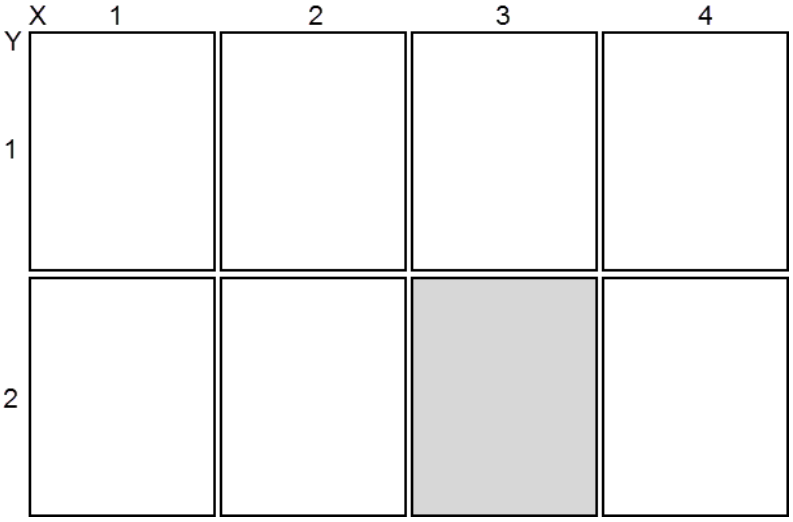
Viewing the pages in the track sheet

If your project is large (i.e. there are many tracks and/or many events) or if you are working with a large scale factor (see below), the resulting track sheet may have more than one page.

The more tracks you have, the larger the number of pages next to each other (horizontally). The more events you have, the larger the number of pages below each other.

To select which page is visible in the Track Sheet window, you use the “Y Page” and “X Page” fields in the upper left part of the Track Sheet window. Think of the Track Sheet as divided into rows and columns, with “Y Page” determining which row is viewed and “X Page” determining the column. The numbers in parenthesis show the total number of rows and columns, respectively.

In this case, the page in row 2 and column 3 is shown:



- The size and proportions of the Track Sheet pages are set with the Page Setup dialog.

RELATED LINKS

Printing the track sheet on page 1017

Adjusting the view

The two sliders at the bottom of the Track Sheet window have the following functionality:

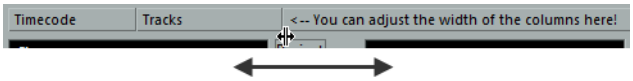
- The slider in the lower left corner is the scale slider.

Use this to adjust the actual size of the track sheet contents (including the font sizes). This will also affect the number of tracks and events shown on each page.

- The slider in the lower right corner governs the display zoom.

  This affects how much of the track sheet is shown in the Track Sheet window – the printout is not affected.

You can also adjust the width of the columns by dragging the edges of the “Timecode” and “Tracks” fields at the top of the window – this resizes the corresponding columns in the Track Sheet.



Resizing the track columns. If the Timecode and Tracks fields are hidden, click the “More” button.

Additional settings

- The “Pen Width” determines the thickness of the vertical lines that bind together the start and end times for events and parts.
- If the track sheet is more than one page wide, you can use the “Timecode Column” pop-up menu to determine whether the time column only appears on the first page, on each new page, or not at all.

The following settings can be shown or hidden by clicking the “More/Less” button.

Project

By default, this is the name of the current project, but you can adjust this if you like. The project name will be shown in the top left corner of each track sheet page.

Editor

The editor name you enter will be shown below the project name in the track sheet.

Heading

Allows you to enter a heading (shown centered at the top of each track sheet page).

Do not show end times if length is under…

If this checkbox is ticked, the track sheet will not display the end times of events shorter than the time specified in the field to the right. This is useful if you have many short events, like spot effects, where only the start time is of any relevance.

No leading zeroes

By default, the time positions of events will be listed in a syntax with “leading zeroes”. For example, if the display format is seconds, hours and minutes will be listed as “01”, “02” etc. If this is activated, the time column will not display the leading zeroes.

Merge events if gap is less or equal…

If events on a track are lined up end to end – i. e. there is no gap between them – they will be considered as a single event in the track sheet. By defining a value in this box, you can specify how large a gap between events has to be for them to be considered as separate events. If gaps between events are smaller than or equal to the value you specify, they will be listed as a single event. Otherwise they will be listed as separate events.

Name Filter

This allows you to filter out certain event names of your choice so that they are not displayed in the track sheet. Click in the text field and type in the name(s) – to enter several names, separate each with a semi-colon (;). Partial names are OK, so if you want to filter out the event name “Crossfade”, for example, you could just write “Cross”. However, this would filter out other events starting with the word cross as well – e.g. “Crosstalk” would also be filtered out.

Printing the track sheet

Printing is done using the standard procedures:

PROCEDURE

1. On the File Menu, select the “Page Setup…” option.

   The Page Setup dialog opens.

2. Make sure that the correct page size and page orientation are selected.

   You may also want to make additional printer settings, following the standard Windows/Mac procedures.

3. Select “Print…” from the File menu.

   Make the desired printer settings in the dialog that opens, and click Print. The track sheet is printed.

Export Audio Mixdown

Introduction

The Export Audio Mixdown function in Nuendo allows you to mix down audio from the program to files on your hard disk in a number of formats. In the Channel Selection section, you can choose which channels (or busses) to export.

By activating the “Channel Batch Export” option you can choose to mix down several channels in one go. For each channel, an individual file will be created.

The following channel types are available:

- Output channels

  For example, if you have set up a stereo mix with tracks routed to a stereo output bus, mixing down that output bus will give you a mixdown file containing the whole mix. Similarly, you can mix down a complete surround bus, either to a single multi-channel file or to one file per surround channel (by activating the Split Channels option).

- Audio track channels

  This will mix down the channels for the tracks, complete with insert effects, EQ, etc. This can be useful for turning a number of events into a single file, or to convert tracks with insert effects into audio files (that are less CPU-intensive). Simply export the track and re-import the file into the project.

- Any kind of audio-related MixConsole channel

  This includes VST instrument channels, instrument tracks, effect return channels (FX channel tracks), group channels, and ReWire channels. There are many uses for this – for example, you can mix down an effect return track or turn individual ReWire channels into audio files.

Please note the following:

- The Export Audio Mixdown function mixes down the area between the left and right locators or ranges defined by cycle markers.

- When you mix down, you get what you hear – mutes, MixConsole settings, record enable, and insert effects are taken into account.

  Note though that you will only include the sound of the channels you select for mixdown.

- MIDI tracks are not included in the mixdown!

To make a complete mixdown containing both MIDI and audio, you first need to record all your MIDI music onto audio tracks (by connecting the outputs of your MIDI instruments to your audio inputs and recording, as with any other sound source).

Mixing down to audio files

PROCEDURE

1. Set up the left and right locators to encompass the section you want to mix down.

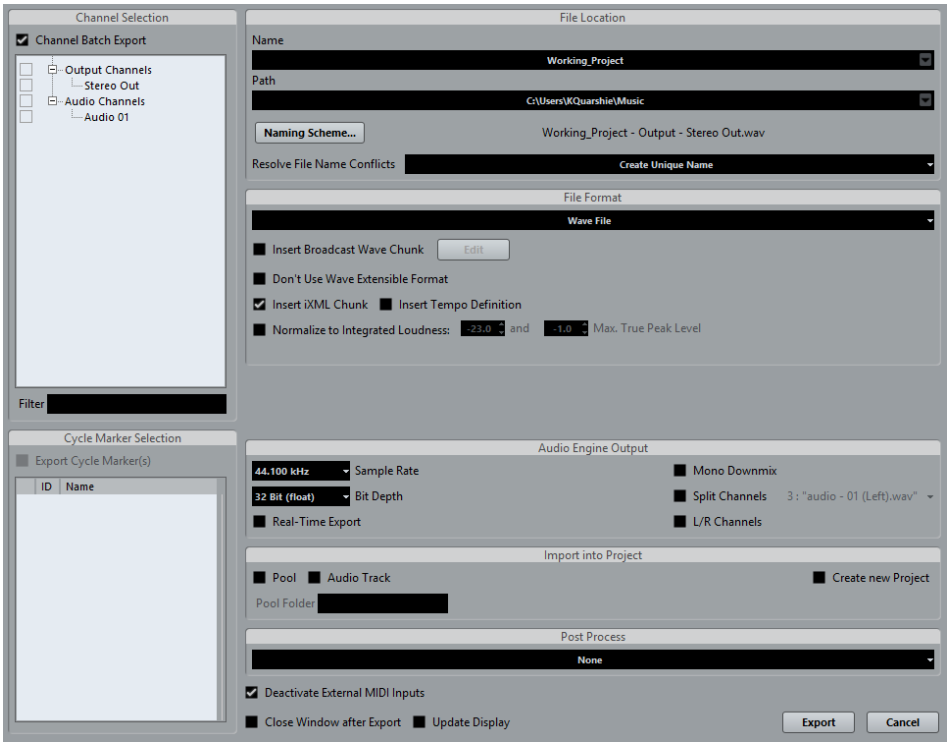
   You can also set up a cycle marker accordingly.

2. Set up your tracks so that they play back the way you want.

   This includes muting unwanted tracks or parts, making manual MixConsole settings and/or activating the R (Read) automation buttons for some or all MixConsole channels.

3. Open the File menu and select “Audio Mixdown…” from the Export submenu.

   The Export Audio Mixdown dialog opens.



4. In the Channel Selection section to the left, select the channels you want to mix down. The list contains all output and audio-related channels available in the project.

   Activate the Channel Batch Export option if you want to mixdown several channels at once.

5. If you want to export a cycle marker range instead of the area between the left and right locators, activate the Export Cycle Markers option and select the corresponding markers.

   Only the cycle markers of the active track can be selected. On export, you get one audio file for each section defined by a cycle marker. Please keep in mind that working with channel batch export and cycle markers might lead to a high file number. For example, exporting five tracks and three cycle markers leads to 15 new audio files.

6. In the File Location section at the top, you can set up the naming scheme for the exported files and select a path for the mixdown files.

7. Select an entry from the File Format pop-up menu and make additional settings for the file to be created.

   This includes codec settings, meta data, sample rate, bit depth, etc. The available options depend on the selected file format.

8. In the Audio Engine Output section, specify whether you want to export all subchannels of a multi-channel bus as separate mono files (Split Channels), downmix all subchannels to one mono file (Mono Downmix), or export only the left and right channels of a multi-channel bus to a stereo file (L/R Channels).

9. Activate Real-Time Export if you want the export to happen in realtime.

10. If you want to automatically import the resulting audio files back into Nuendo, activate any of the checkboxes in the “Import into Project” section.

11. If you activate Update Display, the meters will be updated during the export process.

    This allows you to check for clipping, for example.

12. Click Export.

    A dialog with a progress bar is displayed while the audio files are being created.

    To cancel the operation, you can click the Cancel button.

    - During the realtime export of a single channel, the Audition Volume fader is displayed in the progress dialog. It allows you to adjust the Control Room volume.

      Note that this fader is only available if the Control Room is activated.
    - If the “Close Window after Export” option is activated, the dialog will be closed automatically.
    - If the “Deactivate External MIDI Inputs” option is activated, any MIDI inputs that are performed on external devices during the export process are ignored.

    IMPORTANT

    If you set the export range in such a way that the effects applied to a preceding event (e.g. reverb) reach into the next, these will be heard in the mixdown (even though the event itself is not included). If you do not want this, you need to mute the first event before exporting.

    - If you have activated any of the options in the “Import into Project” section, the mixdown files will be imported back into the same or a new project.

      When playing back the reimported file in the same Nuendo project, mute the original tracks so that you only hear the mixdown.

RELATED LINKS

About the Channel Selection section on page 1021

About the File Location section on page 1022
The available file formats on page 1028
About the Audio Engine Output section on page 1025
About the Import into Project section on page 1027

The Export Audio Mixdown dialog

Below you will find detailed descriptions of the different sections of the dialog and the corresponding functions.

About the Channel Selection section

The Channel Selection section shows all output and audio-related channels available in the project. These channels are organized in a hierarchical structure that allows you to easily identify and select the channels you want to export. The different channel types are listed below each other, with channels of the same type being grouped in a node (e.g. instrument tracks).

- You can activate/deactivate channels by clicking on the checkboxes in front of the channel names.
- If Channel Batch Export is activated, you can also activate/deactivate all channels of the same type by clicking on the checkbox in front of the channel type entry.
- If Channel Batch Export is activated, you can select/deselect several channels in one go using the [Shift] and/or [Ctrl]/[Command] modifiers and then clicking on any of the checkboxes for the highlighted channels.

  Note that this toggles the activation status of a channel, i.e. all selected channels that were previously activated will be deactivated and vice versa.

If your project contains a large number of channels, it might get difficult to find the desired channels in the Channel Selection section.

- To simplify the process of selecting several channels, you can filter the display. Simply type in the desired text (e.g. “voc” to show all tracks containing vocals) in the Filter field below the tree view.

About the Cycle Marker Selection section

If you have already set up cycle markers to organize your project, or if you want to export different subsections of a project in one go, it might be useful to define the export range based on cycle markers. This is done in the Cycle Marker Selection section at the bottom left of the window.

IMPORTANT

When using multiple marker tracks, this section always shows the cycle markers from the track that has the focus.

- To select the export range, activate the “Export Cycle Marker(s)” option and select the desired marker(s) from the list.

  A checkmark in front of the marker ID indicates that a cycle marker is selected.

- If you have selected several cycle markers and clicked the Export button, the ranges defined by these markers are exported one after the other, starting with the topmost marker in the list.

NOTE

If “Export Cycle Marker(s) is activated, the Naming Scheme pop-up menu (see below) contains two more elements: Cycle Marker Name and Cycle Marker ID.

RELATED LINKS

Cycle Markers on page 312

About the File Location section

In the File Location section you can specify a name and a path for the exported files.

Furthermore, you can define the naming scheme for the exported files.

At the right of the Name and the Path fields there are two pop-up menus with a number of options:

Naming Options

- Select “Set to Project Name” to set the Name field to the project name.
- Activate the “Auto Update Name” option to add a number to the specified file name every time you click the Export button.

Path Options

- Select “Choose…” to open a dialog in which you can browse for a path and enter a file name.

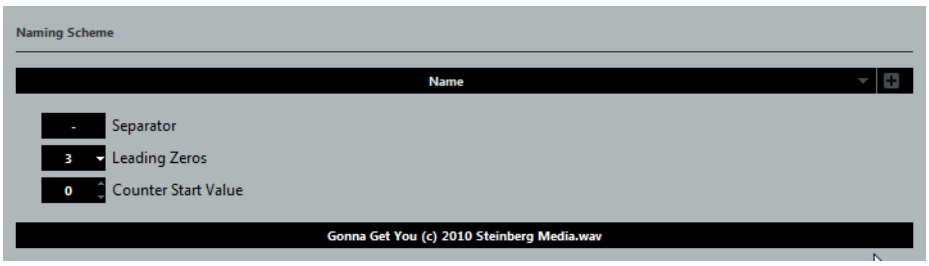
  The file name will automatically be shown in the Name field.

- Select an entry from the Recent Paths section to reuse a path specified for a previous export.

  This section is only shown after an export has been completed. With the “Clear Recent Paths” option you can delete all entries from the Recent Paths section.

- Activate the “Use Project Audio Folder” option to save the mixdown file in the project’s Audio folder.

Naming Scheme



Clicking the “Naming Scheme…” button opens a separate pop-up window. Here, you can choose a number of elements that will be combined to form the file name.

Depending on the settings in the Channel Selection and Marker Selection sections, different elements are available.

The elements are defined as follows:

Name

The name that you entered in the Name field (in the File Location section).

Mixer Index

The number of the MixConsole channel.

Channel Type

The type of audio-related channel that is being exported.

Channel Name

The name of the exported channel.

Project Name

The name of the Nuendo project.

Counter

This is only available for batch export. Use this to include an incrementing number in the generated files names in order to create unique file names.

Cycle Marker Name

This is only available for cycle marker exports. This is the name as shown in the Marker window or the info line in the Project window.

Cycle Marker ID

This is only available for cycle marker exports. This is the ID as shown in the Project window and the Marker section of the Export Audio Mixdown dialog.

NOTE

By combining the available naming elements, you can make sure that all the files of a batch are exported with unique names. If you have set up a naming scheme that would result in identical file names, a warning message appears when you click the Export button.

- To add an element, press the "+" button on the far right, and to remove an element from the naming scheme click the corresponding "-" button.

  You can also remove an element by dragging it out of the Elements section.

- To rearrange the sequence, simply click on an element and drag it to a different position.

- To choose a different element for a certain position, click on the element name and select a new entry from the pop-up menu.

  Each element can only be used once in a naming scheme. The pop-up menu therefore shows only those elements that are still available.

Below the Elements section, you will find some additional options:

Separator

Allows you to enter any character sequence to be used as a separator between the naming elements (e.g. a hyphen enclosed in spaces).

Leading Zeros

This controls how many leading zeros the Counter and Mixer Index components will have. For example, if you set this to "2", the numbers from 1 to 10 will be written as 001 to 010.

Counter Start Value

Here you can enter a number that is used as the first Counter value.

The field below these options shows a preview of what the resulting file names will look like.

For example, if you set up the elements as follows:

<Project Name> - <Channel Name> - <Cycle Marker Name>

This could result in a file name such as the following:

Reel2 - Dialogue - Scene15.wav

NOTE

To close the Naming Scheme pop-up window, simply click anywhere outside the pop-up window. The generated name will now also be shown to the right of the "Naming Scheme…" button.

Resolve File Name Conflicts

Exporting audio can result in file name conflicts with existing files that have the same name. You can define how file name conflicts are resolved.

In the **Export Audio Mixdown** dialog, select one of the following options from the **Resolve File Name Conflicts** pop-up menu:

Always Ask

Always asks if an existing file should be overwritten or if a new unique file name should be created by adding an incremental number.

Create Unique Name

Creates a unique file name by adding an incremental number.

Always Overwrite

Always overwrites the existing file.

About the File Format section

In the File Format section, you can select the file format for your mixdown files and make additional settings that are different for each file type.

RELATED LINKS

The available file formats on page 1028

About the Audio Engine Output section

The Audio Engine Output section contains all the settings related to the output of the Nuendo audio engine. The following options are available:

Sample Rate (uncompressed file formats only)

This setting determines the frequency range of the exported audio – the lower the sample rate, the lower the highest audible frequency in the audio. In most cases, you should select the sample rate set for the project, since a lower sample rate will degrade the audio quality (mainly reducing the high frequency content) and a higher sample rate will only increase the file size, without adding to audio quality. Also consider the future usage of the file: If you plan to import the file into another application, for example, you should select a sample rate supported by that application.

If you are making a mixdown for CD burning, you should select 44.100 kHz, since this is the sample rate used on audio CDs.

Bit Depth (uncompressed file formats only)

Allows you to select 8, 16, 24 bit or 32 bit (float) files. If the file is an “intermediate mixdown” that you plan to re-import and continue working on in Nuendo, we recommend that you select the 32 bit (float) option.

32 bit (float) is a very high resolution (the same resolution as used internally for audio processing in Nuendo), and the audio files will be twice the size of 16 bit files.

If you are making a mixdown for CD burning, use the 16 bit option, as CD audio is always 16 bit.

In this case, we recommend dithering.

Activate the UV-22HR dithering plug-in (see the separate PDF document "Plug-in Reference" for details). This reduces the effects of quantization noise and artifacts from being introduced when converting the audio down to 16 bit. 8 bit resolution should only be used if required, since it results in limited audio quality. 8 bit audio may be suitable in some multimedia applications, etc.

Mono Downmix

Activate this if you want to downmix all the subchannels of a stereo or surround channel or bus to a single mono file.

To avoid clipping, the following summing rules are applies:

Stereo: The panning law as defined in the Project Setup dialog is applied.
Surround: The channels are summed and then divided through the number of channels used (in case of a 5.1. channel = (L+R+C+LFE+Ls+Rs)/6).

Split Channels

Activate this if you want to export all subchannels of a multi-channel bus as separate mono files.

L/R Channels

Activate this if you want to export only the left and right subchannels of a multi-channel bus into a stereo file.

Real-Time Export

Activate this if you want the export to happen in realtime, in which case the process will take at least the same time as regular playback.

Some VST plug-ins, external instruments and effects require this in order to have enough time to update correctly during the mixdown – consult the plug-in manufacturers if uncertain.

When Realtime Export is activated, the exported audio will be played back via the Control Room.

Depending on the CPU and disk speed of your computer, it may not be possible to export all channels simultaneously if Real-Time Export is activated. If an error occurs during the realtime export, the program will automatically stop the process, reduce the number of channels and start again. Afterwards the next batch of files is exported. This is repeated as often as needed to export all selected channels. Due to this splitting of the export process in "runs", the realtime export might take longer than the actual playback would.

RELATED LINKS

Dithering on page 447

About the Import into Project section

In this section you will find several options for importing the resulting mixdown files back into the existing or into a new project:

- If you activate the Pool checkbox, the resulting audio file will automatically be imported back into the Pool as a clip.

  Use the Pool Folder option to specify in which Pool folder the clip will reside.

- If you activate the Audio Track option as well, an audio event that plays the clip will be created and placed on a new audio track, starting at the left locator.

  If you activate the Audio Track option, the Pool option will automatically be activated as well, and deactivating the Pool option also deactivates the Audio Track option.

- If you activate the “Create New Project” option, a new project is created that contains one audio track for each of the exported channels, as well as the signature and tempo track of the original project. Note that if this is activated, the Pool and Audio Track options are disabled.

  The tracks will have the corresponding mixdown file as audio event. The track names will be identical with the export channel names. Note that the new project will be the active project.

NOTE

The Create New Project option is only available if you have selected an uncompressed file format and the Use Project Audio Folder option is deactivated.

RELATED LINKS

Importing Media on page 588

About the Import Options dialog

If you activate any of the options in the “Import into Project” section, the Import Options dialog will open for each exported channel when the export is complete.

RELATED LINKS

Importing Media on page 588

About the Post Process section

In the Post Process section, you can select a process that you want to execute after mixing down your audio file.

- You can select “Upload to SoundCloud” to launch SoundCloud, connect to your user account, and upload your mixdown.

The available file formats

- AIFF files
- AIFC files
- MXF files
- Wave files
- Wave 64 files
- Broadcast Wave files
- FLAC files
- MP3 files
- Ogg Vorbis files
- Windows Media Audio Pro files (Windows only)

IMPORTANT

Note that the Wave 64 file format is the only format that allows you to export files with a resulting size of more than 2 GB.

NOTE

Most of the settings described below for AIFF files are available for all file types. Where this is not the case, you will find additional information in the corresponding section.

RELATED LINKS

AIFF files on page 1029
AIFC files on page 1030
MXF files (OP-Atom) on page 1030
Wave files on page 1030
Wave 64 files on page 1031
Broadcast Wave files on page 1031
FLAC files on page 1031
MPEG 1 Layer 3 files on page 1031
Ogg Vorbis files on page 1032
Windows Media Audio Pro files (Windows only) on page 1032

AIFF files

AIFF stands for Audio Interchange File Format, a standard defined by Apple Inc. AIFF files have the extension .aif and are used on most computer platforms. For AIFF files the following options are available:

Insert Broadcast Wave Chunk

This allows you to include information about the date and time of creation, a timecode position (allowing you to insert exported audio at the correct position in other projects, etc.) along with author, description, and reference text strings in the exported file. Some applications may not be able to handle files with embedded info – if you get problems using the file in another application, deactivate the option and re-export.

Edit button

By clicking this button, the **Broadcast Wave Chunk** dialog opens, where you can enter additional information that will be embedded in the exported files. If you activate the **Use this Timecode** checkbox in this dialog, the timecode position that is specified in the **Timecode** field will be used instead of the timecode position that is automatically derived from the left locator.

NOTE

In the **Preferences** dialog (**Record–Audio–Broadcast Wave** page) you can enter default text strings for author, description, and reference that will automatically be displayed in the **Broadcast Wave Chunk** dialog.

Insert iXML Chunk

This allows you to include additional project-related metadata, for example, project name, author, and project frame rate in the exported file. Some applications may not be able to handle files with embedded info. If you get problems using the file in another application, deactivate the option and re-export.

NOTE

In the **Project Setup** dialog you can find the **Author** and **Company** fields that you can use to include the corresponding data in the iXML chunk. These fields are also available in the **Preferences** dialog (**General–Personalization** page).

Insert Tempo Definition

This option is only available if **Insert iXML Chunk** is activated. When **Insert Tempo Definition** is activated, tempo information from the tempo track or the **Definition** tab of the **Sample Editor** is included in the iXML chunk of exported files. This is useful if you want to use the files in other projects where they need to adapt to the project tempo.

AIFC files

AIFC stands for Audio Interchange File Format Compressed, a standard defined by Apple Inc. These files support compression ratios as high as 6:1 and contain tags in the header. AIFC files have the extension ".aifc" and are used on most computer platforms.

AIFC files support the same options as AIFF files.

MXF files (OP-Atom)

MXF stands for Material Exchange Format. This is a container format for digital video and audio. MXF files have the extension ".mxf" and are used on most computer platforms. MFX audio files are often part of AAF projects.

RELATED LINKS

Exporting and importing AAF files on page 1196

Wave files

Wave files have the extension ".wav" and are the most common file format on the PC platform.

Wave files support the same options as AIFF files and have one additional option:

- Don't Use Wave Extensible Format

  The Wave Extensible format contains additional metadata, such as the speaker configuration. It is an extension to the normal Wave format that some applications may not be able to handle.

  If you get problems using the Wave file in another application, activate this option and re-export.

NOTE

In the Preferences dialog (Record–Audio) you can specify what happens to files larger than 4 GB. If "Split Files" is activated, the exported Wave file is split when reaching the 4 GB limit. If "Use RF64 Format" is activated, the exported Wave file is saved as RF64 file. Note that not all applications support RF64. If you use a FAT32 file system, activate the "Split Files" option.

Wave 64 files

Wave 64 is a proprietary format developed by Sonic Foundry Inc. In terms of audio quality, Wave 64 files are identical to standard Wave files, but in the file headers Wave 64 files use 64-bit values for addressing where Wave files use 32-bit values. The consequence of this is that Wave 64 files can be considerably larger than standard Wave files. Wave 64 is therefore a good file format choice for really long recordings (file sizes over 2 GB). Wave 64 files have the extension ".w64".

Wave 64 files support the same options as AIFF files.

Broadcast Wave files

Broadcast Wave files are Wave files with additional meta data. To create a Broadcast Wave file, select either Wave or Wave 64 as the file format and activate the Insert Broadcast Wave Chunk option. Click Edit if you wish to edit the chunk information, otherwise the defaults as specified in the Preferences dialog (Record–Audio–Broadcast Wave page) will be used.

The Broadcast Wave file also contains loudness metadata according to EBU R-128. This is shown in the Attribute Inspector of the MediaBay (Audio - Assets).

Broadcast Wave files have the extension ".wav".

Broadcast Wave files support the same options as Wave files.

FLAC files

Free Lossless Audio Codec files are audio files that are typically 50 to 60% smaller than regular Wave files, for example. FLAC is an open source format.

Use the Compression Level fader to select the compression level for the FLAC file. Since FLAC is a lossless format, the level has more influence on the encoding speed than on the file size.

MPEG 1 Layer 3 files

MPEG 1 Layer 3 files have the extension ".mp3". By use of advanced audio compression algorithms, MP3 files can be made very small, yet maintaining good audio quality. In the File Format section, the following options are available for MPEG 1 Layer 3 files:

Bit Rate fader

By moving this fader, you can select a bit rate for the MP3 file. As a rule, the higher the bit rate, the better the audio quality and the larger the file. For stereo audio, 128 kBit/s is often considered to result in "good" audio quality.

Sample Rate pop-up menu

On this pop-up menu you can select a Sample Rate for the MP3 file.

High Quality Mode option

When this is activated, the encoder will use a different resampling mode, which can give better results depending on your settings. In this mode, you cannot specify the Sample Rate, but only the Bit Rate for the MP3 file.

Insert ID3 Tag option

This allows you to include ID3 Tag information in the exported file.

Edit ID3 Tag button

When you click this, the ID3 Tag dialog opens, in which you can enter information about the file. This additional information will be embedded as text strings in the file, and can be displayed by most mp3 playback applications.

Ogg Vorbis files

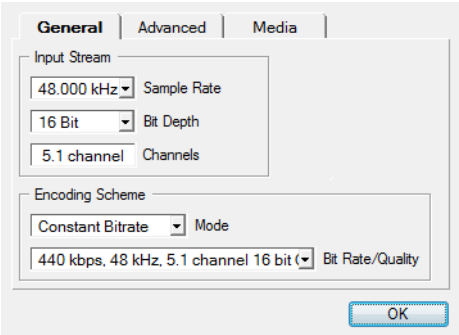
Ogg Vorbis is an open source, patent-free audio encoding and streaming technology, offering compressed audio files (extension ".ogg") of small size, but with comparatively high audio quality.

In the File Format section you will find only one setting: the Quality fader. The Ogg Vorbis encoder uses variable bit rate encoding, and the Quality setting determines between which limits the bit rate will vary. Generally speaking, the higher the Quality setting, the higher the sound quality but also the larger the files.

Windows Media Audio Pro files (Windows only)

This is a continuation of the Windows Media Audio format developed by Microsoft Inc. Due to the advanced audio codecs and lossless compression used, WMA Pro files can be decreased in size with no loss of audio quality. Furthermore, WMA Pro features the possibility of mixing down to 5.1 surround sound. The files have the extension ".wma".

When you select "Windows Media Audio File" as the file format, you can click the "Codec Settings…" button to open the "Windows Media Audio File Settings" window.



Note that the configuration options may vary, depending on the chosen output channels.

General Tab

In the Input Stream section, you set the sample rate (44.1, 48 or 96 kHz) and the bit resolution (16 bit or 24 bit) of the encoded file. Set these to match the sample rate and bit resolution of the source material. If no value matches that of your source material, use the closest available value that is higher than the actual value. For example, if you are using 20 bit source material, set the bit resolution to 24 bit rather than 16 bit.

- The setting in the Channels field depends on the chosen output and cannot be changed manually.

  The settings in the Encoding Scheme section are used for defining the desired output from the encoder, e.g. a stereo or a 5.1 surround file.

  Make settings appropriate for the intended use of the file. If the file will be downloaded or streamed on the internet, you might not want too high bit rates, for example. See below for descriptions of the options.

- Mode pop-up menu

  The WMA Pro encoder can use either a constant bit rate or a variable bit rate for encoding to 5.1 surround, or it can use lossless encoding for encoding to stereo.

  The options on this menu are as follows:

Constant Bitrate

This will encode to a 5.1 surround file with a constant bit rate (set in the Bit Rate/Channels menu, see below).

Constant bit rate is preferably used if you want to limit the size of the final file. The size of a file encoded with a constant bit rate is always the bit rate times the duration of the file.

Variable Bitrate

Encodes to a 5.1 surround file with a variable bit rate, according to a quality scale (the desired quality is set in the Bit Rate/Quality menu, see below).

When you encode with variable bit rates, the bit rate fluctuates depending on the character and intricacy of the material being encoded. The more complex passages in the source material, the higher the bit rate – and the larger the final file.

Lossless

Encodes to a stereo file with lossless compression.

- Bit Rate/Quality pop-up menu

This menu allows you to set the desired bit rate. The available bit rate settings vary depending on the selected mode and/or output channels (see above). If the Variable Bitrate mode is used, the menu allows you to select from various levels of quality, with 10 being the lowest and 100 the highest. Generally, the higher the bitrate or quality you select, the larger the final file will be.

The menu also shows the channel format (5.1 or stereo).

Advanced tab

- Dynamic Range Control

These controls allow you to define the dynamic range of the encoded file. The dynamic range is the difference in dB between the average loudness and the peak audio level (the loudest sounds) of the audio. These settings affect how the audio is reproduced if the file is played on a Windows computer with a player from the Windows Media series, and the “Quiet Mode” feature of the player is activated to control the dynamic range.

The dynamic range is automatically calculated during the encoding process, but you can specify it manually as well.

To manually specify the dynamic range, first put a checkmark in the box to the left by clicking in it, and then enter the desired dB values in the Peak and Average fields. You can enter any value between 0 and -90 dB. Note, however, that it is usually not recommended to change the Average value, since this affects the overall volume level of the audio and therefore can have a negative effect on the audio quality.

The Quiet Mode in a Windows Media player can be set to one of three settings. Below, these settings are listed together with an explanation of how the Dynamic Range settings affect them:

- Off: If Quiet Mode is off, the dynamic range settings that were automatically calculated during the encoding will be used.
- Little Difference: If this is selected and you have not manually changed the dynamic range settings, the peak level will be limited to 6 dB above the average level during playback. If you have manually specified the dynamic range, the peak level will be limited to the mean value between the peak and average values you specified.
- Medium Difference: If this is selected and you have not manually changed the dynamic range settings, the peak level will be limited to 12 dB above the average level. If you have changed the dynamic range, the peak level will be limited to the peak value you specified.
- Surround Reduction Coefficients

  Here you can specify which amount of volume reduction, if any, is applied to the different channels in a surround encoding. These settings affect how the audio is reproduced on a system incapable of playing back the file in surround, in which case the surround channels of the file will be combined into two channels and played back in stereo instead.

  The default values should produce satisfactory results, but you can change the values manually if you wish. You can enter any value between 0 and -144 dB for the surround channels, the center channel, the left and right channels and the LFE channel, respectively.

Media tab

In these fields you can enter a number of text strings with information about the file – title, author, copyright information and a description of its contents. This information will then be embedded in the file header and can be displayed by some Windows Media Audio playback applications.

RELATED LINKS

Surround Sound on page 637

Networking

Introduction

This chapter describes how you can use Nuendo's networking technology to collaborate with other users of Nuendo in a peer-to-peer network.

The "owner" of a project can share it with any number of users via LAN (Local Area Network) connections and/or WAN (Wide Area Network) connections via standard network protocols.

This allows several separate users to work on a project simultaneously and coordinate their efforts, as well as exchange ideas and suggestions.

Using Nuendo to collaborate in a network requires that:

- All users have the same version of Nuendo.
- All computers are either connected via LAN or via the internet through IP addresses.

What can I use the Networking functions for?

The networking technology in Nuendo allows collaboration with, and exchange of, MIDI, video, and audio data – i.e. it is possible to exchange and edit MIDI, video, and audio. Marker tracks and instrument tracks are also included in a shared project. As of this writing, it is not possible to exchange any MixConsole settings.

Even though the networking technology allows for collaboration via WAN connections over the internet, it is primarily designed for use in a LAN workgroup. It can also be used for collaboration over the internet (see below).

Sound Designer II and Networking

IMPORTANT

Please note that using Sound Designer II (SD2) files in projects shared over a network may lead to unpredictable results, and is not recommended.

Networking protocol and ports

In addition to TCP/IP, the Nuendo networking technology uses the standard network protocol UDP (User Datagram Protocol - primarily used to broadcast messages over a network).

Since the technology uses the standard protocols and calls of the operating system, no special hardware or drivers are required to use it, aside from a working NIC card.

Nuendo uses three ports in your system for establishing communication, broadcasting messages and transferring data between users: UDP port 6990, TCP port 6991 and TCP port 6992. These ports need to be open for network communication to be possible.

Considerations for internet use

As previously mentioned, the Nuendo networking functions are designed mainly for use in local area networks, but it is also possible to use them over the internet.

In this case, there are a few things to keep in mind and some system settings you may need to make:

- If a network is to be created with any users connected via the internet, all users need to know the respective IP addresses of the other computers in the network, and use these to establish the connection.
- There may also be issues that need to be resolved regarding firewalls and/or computers connected to the internet via private subnets.

RELATED LINKS

Setting up WAN connections on page 1041

If your computer is behind a firewall

In a LAN, Nuendo uses the UDP port 6990 to establish communication with the other computers. Over the internet however, Nuendo does not use this port. Instead, connection and communication is established and handled via TCP/IP messages sent to the TCP ports 6991 and 6992.

This means that the TCP ports 6991 and 6992 must be open on all computers. Firewalls may block messages to these ports, thus making connection impossible. Consult the documentation for your firewall (or operating system) for information about how to open ports – or contact your network administrator.

If your computer is in a subnet that uses NAT

If your computer resides in a subnet that uses NAT (Network Address Translation), all computers in the subnet share the same external IP address, while the individual computers in the subnet have internal IP addresses.

In this case, you must set up a port mapping from the external ports 6991 and 6992 to your internal ports 6991 and 6992 - i.e. the actual ports on your computer, as opposed to the ports of the subnet.

If computers are in different NAT subnets

If you want to collaborate with users whose computers reside in different subnets that use NAT (see above), it might be a good solution to set up a VPN (Virtual Private Network). A VPN allows secure communication between networks, using the internet for transferring data.

It is beyond the scope of this document to go into any details on how to set up a VPN, but make sure that your VPN will act as a single network and that the ports 6991, 6992, and, if possible, 6990 are open.

The network dialogs

The following sections give you a short overview of the network dialogs and their use:

Project Sharing and Permissions

Open this dialog, if you want to specify the user permissions for the active project before sharing it, either on a project basis, a track basis or both.

Shared Projects

Open this dialog, if you want a list of all identified users and shared projects in the network. This allows you to share your own projects as well as join projects shared by other users. Furthermore, the dialog offers the possibility of connecting to WAN (Wide Area Network) users.

User Manager

Open this dialog, if you want to set up lists of users, define their read and write permissions and save the settings as a permission preset. The presets can then be loaded in the “Project Sharing and Permissions” dialog, letting you share a project with the settings of the permission preset.

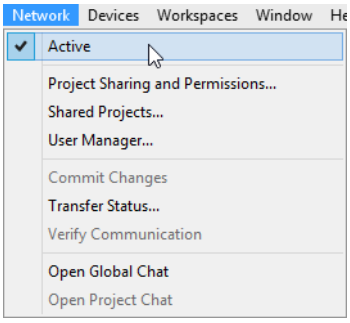
Selecting a user name

When your computer meets the criteria for communicating with other computers (see above), this is how you quickly go about establishing network communication and share a project with others:

PROCEDURE

1. Launch Nuendo.
2. Activate the network by opening the Network menu and activating the “Active” option.

   This establishes network communication and introduces your computer to any computers already present in the network. Your computer now needs to have a unique ID for identification (see below).



3. A dialog opens where you can enter a unique user name to identify your computer in the network.

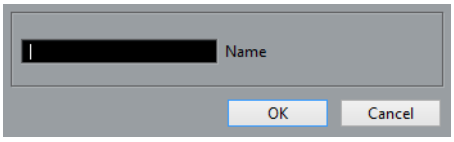
   This is the name that will be displayed in all the network dialogs to identify you to the other users in a network.

   IMPORTANT

   Each user in a network must specify a user name, or network name, in order to be identified in the network. You can also change the name later.

4. Click Yes to enter your user name.

   A dialog opens where you can enter your user name.



   If you do not enter a user name at this point, the network will not be activated.

5. Click in the text field, type in a name of your choice and click OK.

   If the network has already been created, the original creator – or administrator – may have already decided on user names for all participants. If so, ask the administrator for yours and enter it.

   NOTE

   If a name you enter is already in use on another computer in the network, you will be prompted to select another name.

   When you have entered a user name, you can load or create a project that you want to share with the other users.

6. Click the “Share Project” option in the toolbar, or open the “Project Sharing and Permissions” dialog from the Network menu and activate the “Share Project” option.

   The project is now shared and all other users have full access to it.

RELATED LINKS

Creating a permission preset on page 1045
Sharing projects on page 1044

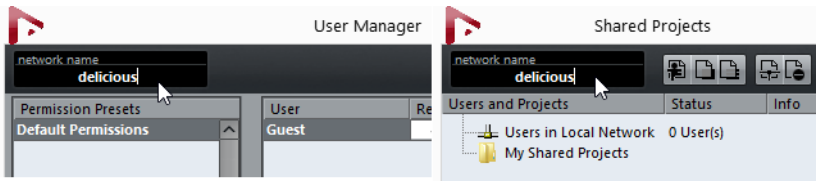
Selecting a user name – alternative method

If you did not specify a user name or if you need to change it, proceed as follows:

PROCEDURE

1. Open either the User Manager dialog or the Shared Projects dialog from the Network menu.

   In the top left corner of both dialogs you will find the Network Name text field.



   Entering a network name in the User Manager dialog and in the Shared Projects dialog.

2. Click in the text field, type in a name of your choice and press [Return].

   This is the name that will be displayed in all the network dialogs to identify you to the other users in a network.

   IMPORTANT

   The following user names “Guest”, “Administrator”, “Admin” and “Anonymous” are reserved and cannot be used.

   Once you have entered a user name and this has been established in the network, it should not be changed unless absolutely necessary! To use an analogy, this is similar to registering for an internet service or discussion forum – once you have registered under a specific name, you cannot log in under another name, unless you create a new account.

Setting up a network

The following is a description of how to set up a network with both LAN and WAN connections.

- For LAN connections, all computers must be part of the same network and communicate properly.
- For WAN connections, all computers must have a working internet connection and a public IP address.

If your intended network meets these criteria, proceed as follows.

Setting up LAN connections

If you want to connect to other users via a LAN, you only have to make sure that all computers actually use the same LAN, that they are communicating properly via the TCP/IP protocol, and that you have activated the network by checking the “Active” item on the Network menu. If the computers are unable to communicate, contact your network administrator, or consult the network documentation for your operating system.

Setting up WAN connections

If you want to connect to other users over the internet, you have to open a WAN connection to each. This requires that all users have a working internet connection and a public IP address.

WAN connections are set up in the Shared Projects dialog in the following way:

PROCEDURE

1. Make sure the “Active” item on the Network menu is checked.

   This initiates network communication with the other participants.

2. Open the Shared Projects dialog from the Network menu.
3. Click the “Add WAN Connection” button in the toolbar.

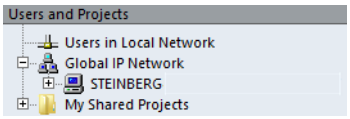
   A dialog opens, requesting the Domain Name or the IP address of the computer you want to connect to.

   The “Add WAN Connection” button

4. Type in the IP address/Domain Name of the computer you want to connect to and click OK.

   An item called “Global IP Network” now appears in the dialog. This lists either the IP address of the computer to which you have connected, or the domain name of its internet service provider.

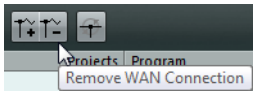


5. Repeat this procedure for every user you want to connect to over the internet.

NOTE

If a computer is dynamically allocated an IP address by its internet service provider – as opposed to having a permanent IP address – you will have to repeat the above procedure each time the computer receives a new IP address!

- You can remove a WAN connection by selecting it and clicking the “Remove WAN Connection” button.



The “Remove WAN Connection” button

- You can remove the entire “Global IP Network” item by selecting it and pressing [Delete] or [Backspace].

  This will also remove any existing WAN connections.

Should you be unable to establish a WAN connection, first verify that you entered the IP address correctly. Connection problems may also occur for the following reasons:

- Your computer and/or the computer you’re trying to connect to is protected by a firewall.
- Your computer and/or the computer you’re trying to connect to does not have the necessary ports open.

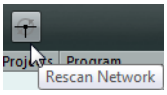
RELATED LINKS

Considerations for internet use on page 1037

Updating the network information

If all users in a network are online and have entered user names, you can do the following to update the network information in Nuendo:

- Open the Shared Projects dialog and click the “Rescan Network” button to update the network information.



At this point, the following will happen:

- The item “Users in Local Network” is updated to display a list of all the online users connected via LAN, along with their user names.
- The item “Global IP Network” is updated to display a list of all the online users connected via WAN, along with their user names.

If the user list is not updated as it should, this is probably because the computers in the network are not communicating properly.

NOTE

Information about users that are offline will not be updated.

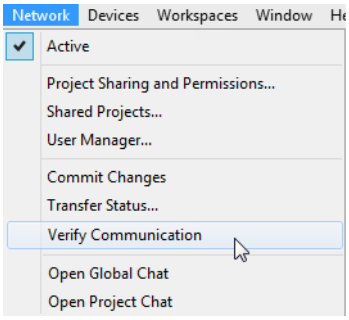
RELATED LINKS

Selecting a user name on page 1039

Verify Communication

Whenever project information needs to be updated over the network, Nuendo will first check if the connection with all project participants is still working. This check is performed in the background with a preset timeout period.

When participants do not respond within this timeout period, a “Commit Failed” message is displayed. At this stage, no further action is performed, as the problem might be temporary (e.g. Laptop unplugged). If the problem persists, however, you can call the “Verify Communication” function via the Network menu.

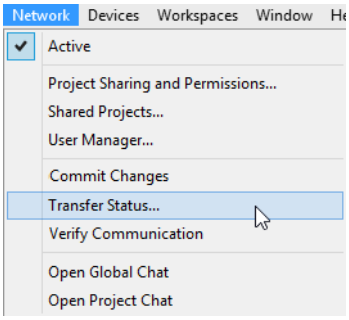


When this function is called, a dialog shows the progress of the checking process.

- When all project participants are found, a dialog lists all project participants and their response times (i.e. the time it took for their computers to respond to the check). If the response times were longer than the standard timeout, or if a participant was not found who you know is in fact online and waiting for network information, you may want to click on “Adjust timer”. This will change the timeout threshold in Nuendo to a longer setting, allowing for participants with slower response times to be found.
- If project participants are not found because they are offline, a dialog will be shown allowing you to remove these users from the workgroup.

Transfer Status

Transfer of network data always is performed in the background. If you want to check on the progress of your transfer processes, you can open the Transfer Status window by pulling down the Network menu and selecting “Transfer Status…”.



As you upload or download project data, the Transfer Status window displays progress bars for every track in the project. The Transfer Status window features Cancel buttons for each of the transfer operations. Use these to stop any transfer operation.

Sharing projects

When you want to share a project with others, you first decide which users you want to have access to the project, and then specify their read and write permissions.

To set up a list of users and their read and write permissions choose one of the following methods:

- Create a permission preset containing all the settings.

  Storing permission presets is practical since they let you apply the same list of users and their permissions to future projects.

- Set up users and their permissions manually for each project.

  This method also allows you to specify permissions for separate tracks in a project, as opposed to the entire project.

- Load the default permissions to let all the participants in a network have access to a project.

We will first describe all of these methods here, and then proceed to describe how you go about sharing a project.

RELATED LINKS

About the Default Permissions preset and the Guest user on page 1046

Creating a permission preset

In the User Manager dialog, read and write permission settings for users can be stored in permission presets. These can then be applied to other projects, i.e. the users will automatically get read and write permissions according to the settings stored in the permission preset.

- Read permission allows users to view and play back shared projects or tracks but not make any changes to them.
- Write permission allows users to make any changes to shared projects or tracks.

  It is not possible to have write permission without also having read permission.

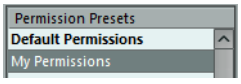
Proceed as follows to create a permission preset:

PROCEDURE

1. From the Network menu open the User Manager dialog.
2. Below the “Permission Presets” column click the plus sign.

   A dialog for the naming of the new permission preset opens.
3. Type in the desired name and click OK.

   The permission preset is created and added to the list.

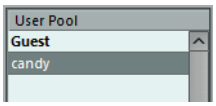
   

   The “User Pool” column to the right lists all the users who have entered a user name, and who have been online and established in the network at some point (note that users do not have to be online to be listed here).

   However, there may also be instances when you want to add a user who is offline and has not been established in the network. If this is the case, the user is not available in the User Pool list, but you can still add him to a permission preset in the following way:
4. Below the “User Pool” column click the plus sign.

   A user with a generic name – “User #” – is added to the list.
5. Type in the desired name.

   The user you’re adding may have decided on a user name and entered it, but has been offline and therefore not yet established in the network. In this case, you can enter that name if you know it. Otherwise, enter a name of your own choice and later let the user know which name to use.

   The next step is to add users to the permission preset.
6. Make sure the preset is selected in the “Permission Presets” column.
7. In the “User Pool” column, select the user(s) you want to add to the permission preset.

   To select several users, hold down [Shift] or [Ctrl]/[Command] and click on the user names.

8. When you have selected the user(s) you want to add, click the Arrow symbol to the left of the “User Pool” column.

   The users you selected will now be added to the “User” column in the middle of the dialog.

   The next thing to do is to define the read and write permissions for the added users. In the Read and Write columns, the read and write permissions for each user can be specified. By default each added user has both read and write permission.

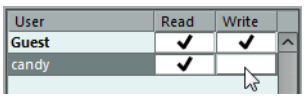
9. If you do not want a user to have read or write permission, click the corresponding column to deactivate the permissions.

   NOTE

   Having write permission automatically means to also have read permission.

RESULT

When you have added the desired users and specified their read and write permissions, the preset is complete. The permission preset will now be available for use.



Permission presets apply to entire projects – i.e. when a permission preset is loaded, the read and write permission settings in it are valid for the entire project. However, you can also specify separate permissions for each track.

NOTE

It is also possible to create a permission preset in the Project Sharing and Permissions dialog.

RELATED LINKS

User Manager on page 1038
Selecting a user name – alternative method on page 1040
Loading a permission preset on page 1049
Setting up permissions for separate tracks on page 1048
Saving the settings as a permission preset on page 1048

Removing permission presets and users

Below each column to the right is a Remove button (the trash icon). You can remove one or several permission preset(s) or user(s) (including the “Guest” user – see below) from the respective columns by selecting them and clicking this icon.

About the Default Permissions preset and the Guest user

The “Default Permissions” preset cannot be removed. You can use it either as is, or you can modify it as you wish by adding and removing users. By default, it contains one user – “Guest” – with both read and write permission.

- If “Guest” is added to a permission preset, anyone in the network can utilize the Guest permissions.

  Therefore, if you share a project that has Guest as a user, anyone in the network can join it with the corresponding permissions.

NOTE

If you want to share a project with everyone in a network and let everyone have both read and write permission for the entire project, the easiest and quickest way to do this is to use the Default Permissions preset as is.

Setting up users and permissions manually

Instead of creating a permission preset in the User Manager dialog, you can use the “Project Sharing and Permissions” dialog to manually set up which users should be allowed to share a project, and what read and write permissions they should have.

It is not possible to add users who have not yet been established in the network. If this is what you want, use the “User Manager” dialog.

PROCEDURE

1. Open the “Project Sharing and Permissions” dialog from the Network menu.
2. In the “All Users” column to the right, select the user(s) you want to share the project with.

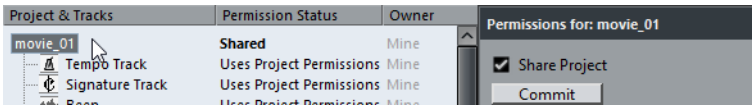
   All users in the network that have entered user names and are established in the network are listed, along with the default “Guest” user. To select several users, hold down [Shift] or [Ctrl]/[Command] and click on the user names.
3. Click the Add User to Permission List button above the column (the left button).

   The selected users are added to the “User Name” column above the “All Users” column.

   To remove a user, select the user name in the “User Name” column and click the Delete User button below the column (the right button).

   The user is removed from the “User Name” column. You can remove several users at once. You should remove the “Guest” user if you do not want everyone in the network to have full access to the project.
4. In the “Project & Tracks” column, make sure the top item (the project name) is selected.

   This way, the settings you make affect the entire project, rather than separate tracks.



5. Define the project read and write permissions for the added users, by checking and unchecking the Read and Write permission columns (“r”, “w”) as desired.

   Note that having write permission automatically means also having read permission.

   These settings are valid for the entire project. If you want to specify read and write permissions separately for each track.

RELATED LINKS

Creating a permission preset on page 1045
Setting up permissions for separate tracks on page 1048

Saving the settings as a permission preset

If you have manually added users and set up their read and write permissions for the project in the “Project Sharing and Permissions” dialog, you can create a permission preset based on the settings you have made:

PROCEDURE

1. Click the plus sign to the left of the “Permission Presets” menu in the bottom right corner.

   A dialog opens, allowing you to enter a name for the permission preset.

2. Type in the desired name and click OK.

   The permission preset is saved and added to the menu.

   You can now also access this preset in the “User Manager” dialog.

RELATED LINKS

Creating a permission preset on page 1045

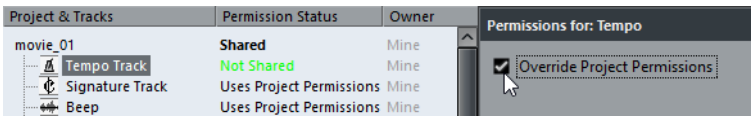
Setting up permissions for separate tracks

The “Project Sharing and Permissions” dialog also offers the possibility of specifying read and write permissions separately for each track in the project.

PROCEDURE

1. In the “Projects & Tracks” column, select the track(s) for which you want to make separate settings.

   As you can see, the right part of the dialog now only contains a checkbox and the text “Override Project Permissions”.



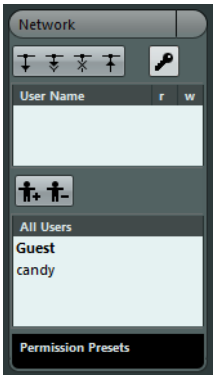
2. Activate the “Override Project Permissions” option.

3. Add users and specify their read and write permissions for the track(s).

4. When you are done, select the top item (the project name) in the “Project & Tracks” column again.

   Permission settings for separate tracks are not saved in a permission preset, but you can first load a preset with the project permissions and then make settings for separate tracks.

   To make separate track permissions in the project Inspector, select a track in the track list, open the Network section in the Inspector and click the “Override Project Permissions” button (the key symbol).

   This makes it possible to make read and write permission settings for the track directly in the Inspector.

RELATED LINKS

Setting up users and permissions manually on page 1047
Loading a permission preset on page 1049

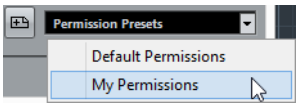
Loading a permission preset

To load a permission preset for the active project, proceed as follows:

PROCEDURE

1. Open the “Project Sharing and Permissions” dialog from the Network menu.
2. In the bottom right corner of the dialog, click in the Permission Presets text box to open a pop-up menu.

   The menu lists all available permission presets.

3. From the menu, select the permission preset you wish to use.

   The users defined in the permission preset are now listed in the User Name column, and their read and write permissions are displayed.

RESULT

You can now either use the settings of the loaded permission preset as they are for the shared project, or you can make manual adjustments on a project or track basis.

RELATED LINKS

Setting up users and permissions manually on page 1047

Sharing a project

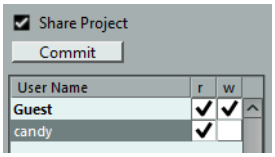
Once you have set up all the users and their permissions – i.e. loaded a permission preset and/or manually added users and specified their permissions for this particular project – you can share the project.

Using the “Project Sharing and Permissions” dialog

PROCEDURE

1. If it is not already active, activate the network by checking the “Active” option on the Network menu.
2. Open the “Project Sharing and Permissions” dialog from the Network menu.
3. Activate the “Share Project” option.

   The project is now shared and available to the users you have specified.

   To revoke sharing of the project, deactivate the “Share Project” option.

   You can at any time make changes in this dialog, i.e. add or remove users and change permissions, and then update the shared project accordingly for all users by making the desired changes and clicking the “Commit” button.

Quick Sharing

If you just want to share a project with full read and write access for every user in the network without loading any permission preset or manually setting up users, the easiest way to do this is to click the “Share Project” button on the Project window toolbar (or activating “Share Project” in the “Project Sharing and Permissions” dialog).

This is provided you have not made any changes to the “Default Permissions” preset. The reason is that the default permissions (with only the user “Guest”) grant all users full access.

RELATED LINKS

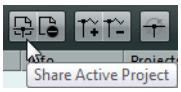
About the Default Permissions preset and the Guest user on page 1046

In the “Shared Projects” dialog

PROCEDURE

1. If it is not already active, activate the network by checking the option “Active” on the Network menu.
2. Open the “Shared Projects” dialog from the Network menu.

3. Click the “Share Active Project” button.



The “Share Active Project” button

This will open the “Project Sharing and Permissions” dialog, to let you verify that all permissions are OK before sharing. You can then share the project in the dialog. When the active project is shared, it appears in the “My Shared Projects” folder.

The “Unshare Selected Project” button

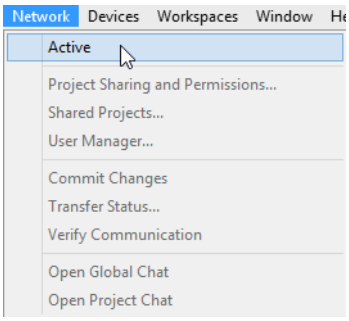
To revoke sharing of a project, select it in the “My Shared Projects” folder and click the “Unshare Selected Project” button.

Deactivating a shared project

If you are sharing a project and want to stop working on it, you do this by deactivating the network. When you deactivate the network during work with a shared project, the other users will be disconnected from it. However, sharing will not be revoked unless you specify it – meaning that the next time you connect to the network, the project will still be shared, allowing the other users to join it without you having to make permission settings and share it all over again.

PROCEDURE

1. To deactivate the network, pull down the Network menu and select “Active”, so that the checkmark is removed.



2. A dialog opens, asking you to confirm that you want to disconnect the network.

   All the users will be disconnected from the project. The project will still be shared when you connect to the network again.

   To reactivate the network, check the “Active” option on the Network menu again.

   A dialog opens, asking you to confirm that you want to reconnect the network. All the users with whom you previously shared the project will now be able to join it again.

About the project folder

When you're sharing a project, you have to decide whether the project folder for it should be located on your local hard disk, or – if you're sharing the project over a LAN and have access to a common file server – if it should be located on the server.

You should consider the following:

- If the project folder is located on your hard disk, the files it contains will be copied to the other users' hard disks, and their project folders.

  This way, work on the files will be done locally on the computer of each user, and the updated files are then copied to the hard disks of the other users.

- If you have access to a file server and place the project folder and its contents on it, the other users can specify this folder as the project folder when they join the project.

  In this case, the project files will not be copied to the other users' hard disks, but are instead accessed directly on the server. Working on the files directly on a server may be slower compared to working on them locally. On the other hand, the files will not have to be copied to each hard disk every time they are updated.

Where to put large media files

If you have a file server that is fast enough for connected workstations to call audio or video playback of files stored on this server, you should place large media files on this server to avoid excessive network traffic.

However, when you are using a Windows workstation, note that when you connect your file server using a drive letter (e.g. V:\), Nuendo will treat this server as a local drive, which means that any data from this server used in a shared project will always be copied over the Nuendo network.

Therefore, try placing your large files on a file server and import them into Nuendo without using the "Copy File to Working Directory" option. The server path should now be displayed in the Pool.

Joining projects

The "Shared Projects" dialog lets you join projects shared by other users in the network.

This dialog lists all the established users in the network, and any projects they are sharing. For you to be able to join a project, the user sharing it must be online and have given you read and/or write access.

To join a project, proceed as follows:

PROCEDURE

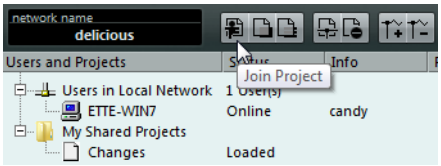
1. Connect to the network by checking the “Active” option on the Network menu.
2. Open the “Shared Projects” dialog from the Network menu.
3. If necessary, click the “Rescan Network” button (the rightmost button on the toolbar).

   Nuendo scans the network for any updated information about online users and/or shared projects, and refreshes the Shared Projects dialog accordingly.

   - The item “Users in Local Network” lists all the established users in a LAN.
   - The item “Global IP Network” lists all the users with whom you have established WAN connections.
4. If there are plus signs beside these items, this indicates that a list of users can be displayed.
5. If a user is sharing projects, this is indicated by a plus sign beside the user name. Click this to display a list of the projects shared by this user.

   If there are shared projects you can join, these are indicated by the text “You can join” in green.
6. To join a project, select it and click the “Join Project” button (or double-click the project name in the list).

   A dialog opens, allowing you to specify the project folder.



7. Select a project folder.

   There may be two cases which require special approaches:

   - If you are connected over a LAN, the owner of the project may have decided to keep the project files in a special, common project folder on a server. If this is the case, you will need to specify this folder as the Project folder.
   - If the owner of the project keeps the project files in a project folder on a local hard disk, select a local folder on your hard disk. In this case, the project files will be copied to the project folder on your hard disk.
8. When you have selected a project folder, the project and the files are copied to your hard disk (unless you’re working on a server).

   If you have access not to the entire project, but only separate tracks, only the tracks for which you have read or write permission will be loaded.

RELATED LINKS

Setting up WAN connections on page 1041
About the project folder on page 1052

Downloading selected tracks

When you click the “Download Selected Tracks” button, you can select which tracks from which shared projects you want to download to your computer.

You will be asked whether you wish to create a new project. When you select No, the downloaded tracks will be added to your active project. Note that you cannot download tracks into a shared project.

Merging your project to the network project

When you click the “Merge Active Project to Selected Network Project” button, the currently active project will be merged with the selected Network project.

You will be asked whether you wish to download the shared project before merging.

- Clicking “No” allows you to simply commit your tracks without having to download all shared tracks. (Please stay connected until all others have received your tracks.)
- When you click “Yes”, you can join using your active project without having to create a new project locally.

The Project Sharing and Permissions dialog for your local project will be displayed. When you are happy with all permission settings, click on “Start Merge”. This will join the Network project and download all available tracks. When the download is complete, you can commit your tracks.

Disconnecting from projects

If you have joined a project and want to stop working on it, you do this by deactivating the network. When you deactivate the network during work with a shared project, you will disconnect from it. However, you will still have access to the project in the future as long as the owner shares it with you. The next time you connect to the network, the project will still be shared with you (unless the owner has changed the permissions) and you can join it again.

PROCEDURE

1. Pull down the Network menu and select the Active item, so that it is not checked to deactivate the network.

   A dialog will appear, asking you to confirm that you want to disconnect from the network.

2. Click “Yes”.

   You will disconnect from the project.

   To reactivate the network, select “Active” on the Network menu again.

   A dialog opens, asking you to confirm that you want to reconnect to the network. If the project is accessible on the network, you will rejoin it and all the project files will be loaded (see below).

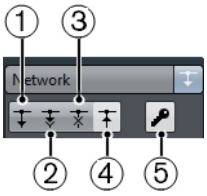
Working with shared projects

Any user who has write access to the project or separate tracks in it can make changes and commit these to the other users. The communication and transfer of updated files is handled mainly in the Network section for each track in the Inspector.

The permission status of a track is indicated in the Inspector as follows:

- If the symbol on the right of the Network tab in the Inspector is displayed in a lighter color, you have both read and write access to the track and can make changes to it.
- If the symbol on the right of the Network tab in the Inspector is orange, you have only read access to the track, and cannot make changes to it.

The Network section contains several controls for network-related track functions:



1) Load available update
2) Automatically apply updates
3) Get exclusive access (lock track)
4) Commit changes on this track
5) Override project permissions – only available for the owner of the project

In addition to the above, the Network section also displays the user name of the owner of a project you join.

NOTE

You can also customize Nuendo so that the four main network control buttons are available in the track list. This is done in the Track Controls Settings dialog.

RELATED LINKS

Setting up permissions for separate tracks on page 1048
Customizing Track Controls on page 139

Committing changes

To a track

When you have made changes to a track, proceed as follows to commit them and make them known to the users in the network:

PROCEDURE

1. Open the Network section for the track in the Inspector by clicking its tab.

   If you have set things up so that the commit button is available in the track list, you do not have to use the Inspector.

2. Click the button “Commit changes on this track”.

   The changes are committed to the network.

   NOTE

   If more than one track is selected, clicking this button for one selected track will commit the changes on all selected tracks. For the owner of a project, this is also the way to update permission settings made directly in the Inspector.

RELATED LINKS

Setting up permissions for separate tracks on page 1048

To a project

If you have made changes to several tracks, or made other project changes, you will probably want to commit all changes at once:

- Pull down the Network menu and select “Commit Changes” to commit the changes over the network.

  Alternatively, you can click the corresponding button on the Project window toolbar.

IMPORTANT

Each time you commit a change to a track or project, network activity is initiated, slowing the network down. Depending on the speed of the network, it may take some time before the changes are distributed to all users and work can continue, so commit changes sparingly and only when necessary.

RELATED LINKS

Using the Setup options on page 1226

Loading changes

When other users have made changes to a track and committed them over the network, the “Load available update” button in the network controls for the corresponding track lights up to indicate that you can load the changes and update the project.

The “Load available update” button is located in the Network section of the Inspector. However, when working with shared projects, you will probably want to customize Nuendo so that it is also available in the track list (see above), since this makes it somewhat easier to get a visual overview of when committed changes are available.

You can use two different methods to load available changes to tracks over the network:

- Click the “Load available update” button in the Inspector or the track list.

  This will load the available update for the track.

- Click the “Automatically apply updates” button in the Inspector or the track list for one or more tracks.

  This way, all changes committed to the track(s) by other users will be automatically loaded without requiring your intervention.

There is also a special method for loading changes made to the tempo and signature tracks, as well as loading new tracks:

- Click the “Sync project to network state” button in the Project window toolbar.

  This button lights up to indicate that there are changes available. Click it to have any new tracks and any changes made to the tempo and signature tracks loaded.

NOTE

By default, the Network controls are not visible in the toolbar. If you want them to be visible, you need to customize the toolbar.

NOTE

You can also undo an update! If you have loaded an available update, you can select “Undo Net Update” from the Edit menu. Similarly, you can “undo the undo” by selecting “Redo Net Update”.

Locking tracks

If you have write permission for a track and want to prevent other users from making changes to it, you can lock it for your own use only.

- To lock a track for your exclusive use, click the “Get exclusive access” button for the track in the Inspector or the track list.

- To unlock a track, click the “Get exclusive access” button again so it is no longer lit.

The owner of a project can unlock a track, regardless of who locked it:

- When you click the “Get exclusive access” button for a locked track that was not locked by you, a warning message appears.
- When you are the owner of the project or track, select “Release Lock” to unlock the track.

  Other users can only click “Cancel” to leave the track locked.

About network communication problems

In any network, occasionally, connections may be lost.

When network communication with a participant fails, you can initiate a communication verification process, and attempt to re-establish the lost connection.

After the verification process, a dialog lists the results of the verification process. Nuendo may either have been able to restore communication through the process, or still be unable to communicate with some participant(s). The dialog lists each participant with whom communication still failed (see below).

At this point, you will have to decide whether to remove the participant(s) from the network:

- If you suspect the communication problems are temporary, select “No” and wait to see if communications can be restored.

  You can then later manually perform the verification process if you wish (see below).

- If you believe the communication problems are more severe, for instance if the participant(s) have experienced a system or network crash, select “Yes”.

  The participant(s) will then be removed from the network until able to rejoin again.

If the verification process does not solve the problem, the communication problems are probably of a more serious nature and may require re-configuration of the network settings.

NOTE

You can also initiate the verification process manually by selecting “Verify Communication” from the Network menu.

RELATED LINKS

Verify Communication on page 1043
Setting up a network on page 1041

Reconnecting participants to the Master Network project

When several users have joined a Network project and this is unexpectedly disconnected from the network (i.e. it is not disconnected by e.g. deactivating the Network or by closing the project), these participants can be automatically reconnected.

PROCEDURE

1. Open the Master project again.

   The program automatically searches 10 seconds for the other users in the network. When users are found, a dialog is displayed.

2. Select “Reconnect” if you want the other user(s) to be automatically reconnected.

   When you click the “Unshare” button, the project is unshared.

   NOTE

   This only works if the Master project has been saved.

   If you are unsure about the state of connection, it might be a good idea to unshare the project and to submit it as a new network project, in order to avoid conflicts.

Further options

Chatting with other users on the network

When you are connected to the network, it is possible to chat with other users to discuss changes you are making to shared projects. All network users can see the same chat window.

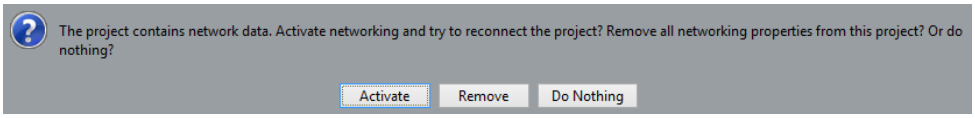
- To chat with all other users on the network, select “Open Global Chat”, type in your message in the window that opens and press [Return].
- To chat only with the users working on the currently shared project, select “Open Project Chat”, type in your message in the window that opens and press [Return].

NOTE

Only messages entered after you joined the chat will be visible to you.

Opening projects with network settings

When you are loading a project containing network settings and the network is deactivated in Nuendo, the following dialog opens:



- Click “Activate” to activate the network in Nuendo and try to reconnect the project.
- Click “Remove” to remove all network settings.

  You can choose this when you do not want to work in the network any longer, or if you have e.g. older projects with corrupt network settings.
- Click “Do Nothing” to open the project without changing any network settings.

Synchronization

Background

What is synchronization?

Synchronization is the process of getting two or more devices to play back together at the same exact speed and position. These devices can range from audio and video tape machines to digital audio workstations, MIDI sequencers, synchronization controllers, and digital video devices.

Synchronization basics

There are three basic components of audio/visual synchronization: position, speed, and phase. If these parameters are known for a particular device (the master), then a second device (the slave) can have its speed and position “resolved” to the first in order to have the two devices play in perfect sync with one another.

Position

The position of a device is represented by either samples (audio word clock), video frames (timecode), or musical bars and beats (MIDI clock).

Speed

The speed of a device is measured either by the frame rate of the timecode, the sample rate (audio word clock) or by the tempo of the MIDI clock (bars and beats).

Phase

Phase is the alignment of the position and speed components to each other. In other words, each pulse of the speed component should be aligned with each measurement of the position for the most accuracy. Each frame of timecode should be perfectly lined up with the correct sample of audio. Put simply, phase is the very precise position of a synchronized device relative to the master (sample accuracy).

Machine control

When two or more devices are synchronized, the question remains: how do we control the entire system? We need to be able to locate to any position, play, record, and even jog and scrub the entire system using one set of controls.

Machine control is an integral part of any synchronization setup. In many cases, the device simply called “the master” will control the whole system. However, the term “master” can also refer to the device that is generating the position and speed references. Care must be taken to differentiate between the two.

Master and slave

Calling one device the “master” and another the “slave” can lead to a great deal of confusion. The timecode relationship and the machine control relationship must be differentiated in this regard.

In this document, the following terms are used:

- The “timecode master” is the device generating position information or timecode.
- The “timecode slave” is any device receiving the timecode and synchronizing or “locking” to it.
- The “machine control master” is the device that issues transport commands to the system.
- The “machine control slave” is the device receiving those commands and responding to them.

For example, Nuendo could be the machine control master, sending transport commands to an external device which in turn sends timecode and audio clock information back to Nuendo. In that case, Nuendo would also be the timecode slave at the same time. So calling Nuendo simply the master is misleading.

NOTE

In most scenarios, the machine control slave is also the timecode master. Once it receives a play command, that device starts generating timecode for all the timecode slaves to synchronize to.

Timecode (positional references)

The position of any device is most often described using timecode. Timecode represents time using hours, minutes, seconds, and frames to provide a location for each device. Each frame represents a visual film or video frame.

Timecode can be communicated in several ways:

- LTC (Longitudinal Timecode) is an analog signal that can be recorded on tape. It should be used for positional information primarily. It can also be used for speed and phase information as a last resort if no other clock source is available.
- VITC (Vertical Interval Timecode) is contained within a composite video signal. It is recorded onto video tape and is physically tied to each video frame.

- MTC (MIDI Timecode) is identical to LTC except that it is a digital signal transmitted via MIDI.
- Sony P2 (9-Pin, RS-422) Machine Control also has a timecode protocol that is mainly used for locating and is not nearly accurate enough for speed and phase. It can be used in certain situations where there is no alternative.

NOTE

The Steinberg SyncStation is capable of using 9-Pin timecode in a very accurate manner.

Timecode standards

Timecode has several standards. The subject of the various timecode formats can be very confusing due to the use and misuse of the shorthand names for specific timecode standards and frame rates. The reasons for this confusion are described in detail below. The timecode format can be divided into two variables: frame count and frame rate.

Frame count (frames per second)

The frame count of timecode defines the standard with which it is labeled. There are four timecode standards:

24 fps Film (F)

This frame count is the traditional count for film. It is also used for HD video formats and commonly referred to as “24 p”. However, with HD video, the actual frame rate or speed of the video sync reference is slower, 23.976 frames per second, so timecode does not reflect the actual realtime on the clock for 24p HD video.

25 fps PAL (P)

This is the broadcast video standard frame count for European (and other PAL countries) television broadcast.

30 fps non-drop SMPTE (N)

This is the frame count of NTSC broadcast video. However, the actual frame rate or speed of the video format runs at 29.97 fps. This timecode clock does not run in realtime. It is slightly slower by 0.1 %.

30 fps drop-frame SMPTE (D)

The 30 fps drop-frame count is an adaptation that allows a timecode display running at 29.97 fps to actually show the clock-on-the-wall-time of the timeline by “dropping” or skipping specific frame numbers in order to “catch the clock up” to realtime.

Confused? Just remember to keep the timecode standard (or frame count) and frame rate (or speed) separate.

Frame rate (speed)

Regardless of the frame counting system, the actual speed at which frames of video go by in realtime is the true frame rate.

In Nuendo the following frame rates are available:

23.9 fps

This frame rate is used for film that is being transferred to NTSC video and must be slowed down for a 2-3 pull-down telecine transfer. It is also used for the type of HD video referred to as “24 p”.

24 fps

This is the true speed of standard film cameras.

24.9 fps

This frame rate is commonly used to facilitate transfers between PAL and NTSC video and film sources. It is mostly used to correct for some error.

25 fps

This is the frame rate of PAL video.

29.97 fps

This is the frame rate of NTSC video. The count can be either non-drop or drop-frame.

30 fps

This frame rate is not a video standard anymore but has been commonly used in music recording. Many years ago it was the black and white NTSC broadcast standard. It is equal to NTSC video being pulled up to film speed after a 2-3 telecine transfer.

59.98 fps

This rate is also referred to as “60 p”. Many professional HD cameras record at 59.98 fps. While 60 fps could theoretically exist as a frame rate, no current HD video camera records at a full 60 fps as a standard rate.

Frame count vs. frame rate

Part of the confusion in timecode stems from the use of “frames per second” in both the timecode standard and the actual frame rate. When used to describe a timecode standard, frames per second defines how many frames of timecode are counted before one second on the counter increments. When describing frame rates, frames per second define how many frames are played back during the span of one second of realtime. In other words: Regardless of how many frames of video there are per second of timecode (frame count), those frames can be moving at different rates depending on the speed (frame rate) of the video format. For example, NTSC timecode (SMPTE) has a frame count of 30 fps. However, NTSC video runs at a rate of 29.97 fps. So the NTSC timecode standard known as SMPTE is a 30 fps standard that runs at 29.97 realtime.

NOTE

When transferring material between various video formats and film, it becomes necessary to change the speed (frame rate) of one timecode standard so that video or film frames can line up in some mathematical relationship to the destination format. That is where all the various pull-ups and pull-downs come from. Certain frame rates were created as a result of applying a pull-down. For example, 23.976 fps is actually 24 fps pulled down by 0.1 %.

RELATED LINKS

About Film Transfers on page 1113
Compensating for Speed Changes on page 1117

Clock sources (speed references)

Once the position is established, the next essential factor for synchronization is the playback speed. Once two devices start playing from the same position, they must run at exactly the same speed in order to remain in sync. Therefore, a single speed reference must be used and all devices in the system must follow that reference. With digital audio, the speed is determined by the audio clock rate. With video, the speed is determined by the video sync signal.

Audio clock

Audio clock signals run at the speed of the sample rate used by a digital audio device and are transmitted in several ways:

Word clock

Word clock is a dedicated signal running at the current sample rate that is fed over BNC coaxial cables between devices. It is the most reliable form of audio clock and is relatively easy to connect and use.

AES/SPDIF Digital Audio

An audio clock source is embedded within AES and SPDIF digital audio signals. This clock source can be used as a speed reference. Preferably, the signal itself does not contain any actual audio (digital black), but any digital audio source can be used if necessary.

ADAT Lightpipe

ADAT Lightpipe, the 8-channel digital audio protocol developed by Alesis, also contains audio clock and can be used as a speed reference. It is transmitted via optical cables between devices.

NOTE

Do not confuse the audio clock embedded in the Lightpipe protocol with ADAT Sync, which has timecode and machine control running over a proprietary DIN plug connection.

Video sync

Video sync signals are transmitted over BNC coaxial connections between devices and run at the frame rate of the video device.

There are two types of video sync signals:

- bi-level (also known as black burst)
- tri-level (used for HD video)

Complications arise when a video device is used as a speed reference. The video sync signal must be converted into an audio clock signal in order for audio devices to synchronize at the correct speed. This can be accomplished as follows:

- Using a dedicated synchronizer such as the Steinberg SyncStation.

  A dedicated synchronizer can take a video sync signal (among others) and generate either word clock or AES/SPDIF signals that may be used as an audio clock source.

- Using a house sync generator.

  A master sync generator such as the Rosendahl Nanosync HD can simultaneously generate video sync and audio clock from the same source. This ensures that both video and audio devices fed by the sync generator will run at the same speed.

NOTE

Some audio cards and interfaces can accept a video sync signal as an audio clock source, performing a similar function to a dedicated synchronizer.

IMPORTANT

Care must be taken to ensure that the incoming video sync frame rate matches that of the Nuendo project.

MIDI clock

MIDI clock is a signal that uses position and timing data based on musical bars and beats to determine location and speed (tempo). It can perform the same function as a positional reference and a speed reference for other MIDI devices. Nuendo supports sending MIDI clock to external devices but cannot slave to incoming MIDI clock.

IMPORTANT

MIDI clock cannot be used to synchronize digital audio. It is only used for MIDI devices to play in musical sync with one another. Nuendo does not support being a MIDI clock slave.

Frame edge alignment (phase)

There are 1600 samples of audio in one frame of video running at 48kHz and 29.97fps. Phase alignment adjusts the playback of Nuendo so that the precise sample of audio is lined up with the leading edge of the timecode frame.

While it is possible to have very good sync without proper phase alignment, it will not be sample-accurate. With Nuendo there are four ways of achieving sample-accurate (phase aligned) sync:

- Using Steinberg's SyncStation synchronizer.

  The SyncStation can resolve video sync, word clock, and timecode all in one unit with extensive machine control capabilities.

- Using Steinberg's Time Base synchronizer.

  The Time Base has the ability to align the audio clock with the incoming timecode.

- Using VST System Link.

  VST System Link connects multiple workstations together using digital audio connections. System Link uses the sample clock for position and speed references, ensuring sample-accurate synchronization.

- ASIO Positioning Protocol (APP)

  Specific ASIO audio cards that have built in timecode readers support Steinberg's APP. APP is able to analyze the incoming timecode and compare that to the sample clock to provide sample-accurate synchronization.

IMPORTANT

APP is only supported when Nuendo is a timecode slave.

The Project Synchronization Setup dialog

Nuendo's Project Synchronization Setup dialog provides a central place to configure a complex synchronized system. In addition to settings for timecode sources and machine control settings, project setup parameters are available along with basic transport controls for testing the system.

To open the Project Synchronization Setup dialog, proceed as follows:

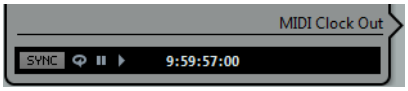
- On the Transport menu, select the "Project Synchronization Setup…" option.
- On the Transport panel, [Ctrl]/[Command]-click the Sync button.

The dialog is organized into sections separating related groups of settings. The arrows shown between the various sections of the dialog indicate how settings in one section influence settings in another section. In the following, the available sections are described in detail.

The Nuendo Section

At the center of the Project Synchronization Setup dialog is the Nuendo section. It is provided to help you visualize the role that Nuendo takes in your setup. It shows which external signals enter or leave the application.

The only controls available in the Nuendo section are the transport controls and the Sync button at the bottom. These controls are duplicates of the ones found in the Transport panel and are made available in order to test various synchronization settings.



Sync button and transport controls in the Nuendo section

The two Project Setup sections

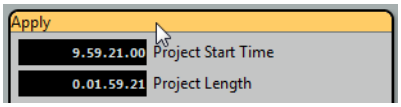
The Project Setup sections at the bottom left of the Project Synchronization Setup dialog are related to the active project in Nuendo. Therefore they are only visible if you have opened a project in Nuendo. Here you can change timecode parameters and project options that affect synchronization.

Unlike the other settings in the Project Synchronization Setup dialog, which are applied globally, the Project Setup options are saved with the active project.

Applying changes to the project setup

When you change any of the parameters in the Project Setup sections, the title bar of the top section changes to “Apply”. Click anywhere on that title bar to apply your changes. If you close the Project Synchronization Setup dialog without applying your Project Setup changes, these will be lost.

Changing the Project Setup settings in the Project Synchronization Setup dialog instead of the Project Setup dialog allows you to test your changes without having to exit the dialog.

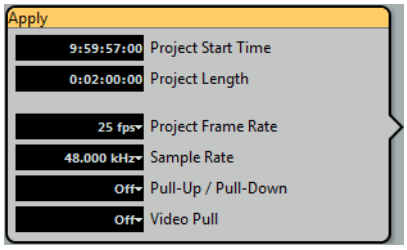


RELATED LINKS

Project Setup Dialog on page 73

Project Setup - Time

The “Project Setup - Time” section has six settings that relate to timecode and playback speed in Nuendo.



Project Start Time

This setting determines the timecode value at the start of the project. For example, many video timelines start at 01:00:00:00 to allow for pre-roll and test tones prior to the one hour mark. In that case, a start time of 00:55:00:00 might be appropriate.

Project Length

This setting determines how much timeline Nuendo allocates to the project. Note that the more time is allocated, the more resources are used. Therefore it is advised to set the length to a reasonable amount for the current project.

Project Frame Rate

This setting determines both the timecode standard and frame rate for the project. Make sure that this setting matches the frame rate of any incoming timecode.

Sample Rate

This setting determines the sample clock speed of Nuendo’s audio engine. Ensure that this setting matches the sample rate of incoming word clock signals or other audio clock sources.

Pull-Up/Pull-Down

This setting affects the speed of the audio transport in Nuendo. If Nuendo’s playback is slowed down or sped up via an external sample clock source, you need to adjust the time displays accordingly by selecting the correct pull factor.

Video Pull

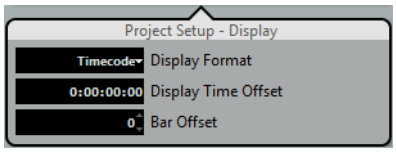
This setting affects the video playback speed in Nuendo. The video playback rate may also be pulled up or down, depending on the need.

RELATED LINKS

Adjusting Audio Playback Speed on page 1117
Pull-Up and Pull-Down on page 1113
Project Setup Dialog on page 73

Project Setup - Display

Regardless of the technical needs of a project's timeline, the user might want to see time information displayed in a different format. The settings in the "Project Setup - Display" section allow you to change how Nuendo's timeline is displayed, but not the underlying timeline itself.



Display Format

This setting determines how Nuendo displays time in the Project window and the primary display of the Transport panel.

Display Time Offset

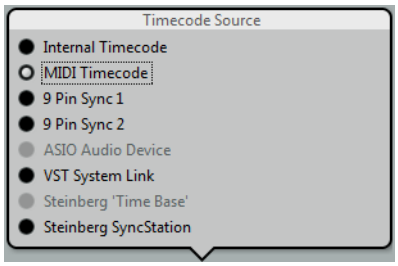
The value set in this field will be added or subtracted from the current timeline position. This setting is used for display only.

Bar Offset

This setting allows you to specify timeline display offsets in musical terms instead of timecode. The Bar Offset value is independent of the "Display Time Offset" value.

Timecode Source

The Timecode Source setting determines whether Nuendo is acting as timecode master or slave.



When set to "Internal Timecode", Nuendo is the timecode master, generating all position references for any other device in the system. The other options are for external timecode sources. Selecting any of these, makes Nuendo a timecode slave when the Sync button is activated.

Internal Timecode

Nuendo generates timecode based on the project timeline and project setup settings. The timecode will follow the format specified in the Project Setup section.

MIDI Timecode

Nuendo acts as a timecode slave to any incoming MIDI timecode (MTC) on the port(s) selected in the MIDI Timecode Settings section, now visible to the left of the Timecode Source section.

Selecting “All MIDI Inputs” allows Nuendo to sync to MTC from any MIDI connection. You can also select a single MIDI port for receiving MTC.

9 Pin Sync 1 & 2

Timecode polling over Sony’s 9-Pin RS422 protocol can be used as a timecode source.

IMPORTANT

Using 9-Pin timecode is not recommended without using Steinberg’s SyncStation hardware. In other scenarios it should only be used if no other timecode source is available.

When you select one of the 9-Pin options, further settings become available in the “9-Pin Device Settings” section to the left of the Timecode Source section:

Option	Description
Serial Port	Use this pop-up menu to select the serial port corresponding to the source of the 9-pin timecode.
Control Playback Speed	When this option is activated, Nuendo will attempt to control the playback speed of the 9-pin device.
Displays follow locating device	When this option is activated, the Project cursor will follow the incoming timecode’s position. This is very helpful with tape-based devices as they locate much slower than non-linear systems. The cursor gives you a visual indication of the position of the tape machine at all times.

ASIO Audio Device

This option is only available with audio cards that support ASIO Positioning Protocol. These audio cards have an integrated LTC reader or ADAT sync port and can perform a phase alignment of timecode and audio clock.

VST System Link

VST System Link can provide all aspects of sample-accurate synchronization between other System Link workstations.

Steinberg Time Base

The Time Base is a hardware synchronizer that can provide sample-accurate sync for Nuendo. Please refer to the documentation that comes with the unit for setup instructions.

Steinberg SyncStation

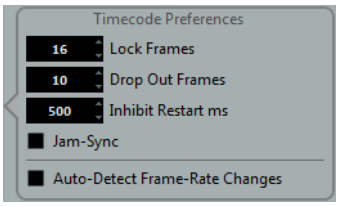
The SyncStation is a full-featured hardware synchronizer with extensive machine control capabilities that provides sample-accurate sync with a variety of external devices. Please refer to the documentation that comes with the unit for setup instructions.

RELATED LINKS

Working with VST System Link on page 1087
Machine Control Output Settings - 9-Pin Control 1 and 2 on page 1075

Timecode Preferences

When MIDI Timecode, Steinberg Time Base, or Steinberg SyncStation is selected, the Timecode Preferences section becomes available, providing several options for working with external timecode.



Lock Frames

This setting determines how many full frames of timecode it takes for Nuendo to try and establish sync or “lock”. If you have an external tape transport with a very short start-up time, try lowering this number to make lock-up even faster. This option can only be set to multiples of two.

Drop Out Frames

This setting determines the amount of missed timecode frames it takes for Nuendo to stop. Using LTC recorded on an analog tape machine can result in some amount of drop outs. Increasing this number allows Nuendo to “free-wheel” over missed frames without stopping. Lowering this number causes Nuendo to stop sooner once the tape machine has stopped.

Inhibit Restart ms

Some synchronizers still transmit MTC for a short period after an external tape machine has been stopped. These extra frames of timecode sometimes cause Nuendo to restart suddenly. The “Inhibit Restart ms” setting allows you to control the amount of time in milliseconds that Nuendo will wait to restart (ignoring incoming MTC) once it has stopped.

Jam-Sync

When the Jam-Sync option is activated, Nuendo will ignore any changes in timecode once it has started playback. This can be useful in special situations, such as synchronizing to broken timecode.

IMPORTANT

When Jam-Sync is enabled, the “Drop Out Frames” value is ignored so that Nuendo does not stop if timecode is interrupted.

Auto-Detect Frame-Rate Changes

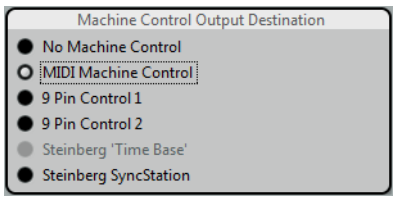
Nuendo can notify the user when the frame rate of timecode changes at any point. This is helpful in diagnosing problems with timecode and external devices. This notification will interrupt playback or recording. Deactivating this option will avoid any interruption in playback or recording.

IMPORTANT

If there is a discrepancy between the project frame rate in Nuendo and incoming timecode, Nuendo might still be able to lock to the incoming timecode. If the user is unaware of these differences, problems can arise later in postproduction.

Machine Control Output Destination

When the Sync button on the Transport panel is activated, all transport commands (including movements of the cursor in the Project window) are translated into machine control commands and routed according to the settings made in the “Machine Control Output Destination” section.



No Machine Control

When this option is selected, transport commands are not routed or sent to any device. This does not affect the operation of the individual 9-Pin and MMC Device panels. They can still function regardless of the machine control destination. The machine control output destination only defines the routing of transport commands from Nuendo while sync is enabled.

MIDI Machine Control

When this option is selected and sync is enabled, all transport commands from the Nuendo transport are routed to MMC devices connected to the MIDI ports that you defined in the “Machine Control Output Settings” section.

9-Pin Control 1 and 2

When one of the 9-Pin Control options is selected and sync is enabled, transport commands from Nuendo are routed to the 9-Pin Device 1 or 2, as configured in the “Machine Control Output Settings” section.

Steinberg ‘Time Base’ and Steinberg SyncStation

When this option is selected and sync is enabled, transport commands from Nuendo are routed to a connected Time Base or Steinberg SyncStation unit (respectively). Please refer to the documentation that comes with your unit for complete information on its operation.

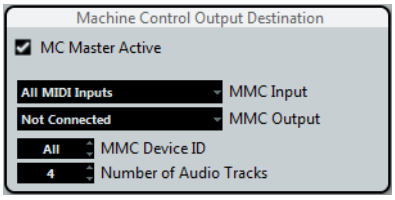
RELATED LINKS

Machine Control Output Settings on page 1074

Machine Control Output Settings

Each machine control destination has settings associated with it. These settings configure how the remote device will respond to transport commands from Nuendo.

Machine Control Output Settings - MIDI Machine Control



There are four settings associated with MIDI Machine Control Operation:

MMC Input and Output

The MMC Input and MMC Output settings determine which MIDI port in your system will send and receive MMC commands. Set both the input and output to MIDI ports that are connected to the desired MIDI device.

MMC Device ID

The MMC device ID should be set to the same number as the receiving device. You can also set the device ID to “All” if more than one machine is receiving MMC commands or if the device ID is not known.

NOTE

Some devices can only listen to their specific IDs. Therefore, using the All option will not work with such devices.

Number of Audio Tracks

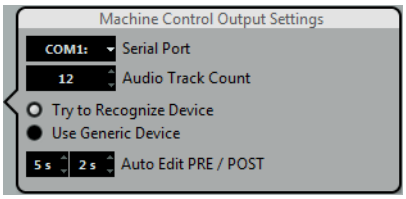
The number of audio tracks should be set to match the amount of available audio tracks in the destination device. This setting determines how many record-enable buttons are shown in the MMC Master panel (see below).

MMC Master panel

The MMC Master panel can be opened from the Devices menu. In order to use the MMC Master panel, proceed as follows:

- Open the Preferences dialog, select the MIDI Filter section and make sure SysEx is activated in the Thru section.
  This is necessary since MMC uses two-way communication (the tape recorder “replies” to the MMC messages it receives from Nuendo). By filtering out SysEx Thru, you ensure that these MMC System Exclusive replies are not echoed back to the tape recorder.
- On the MMC Master panel, activate the Online button to use the transport buttons on the panel to control the transport of the device.
  It is not necessary to have this activated in order to synchronize with the MMC device. It only affects operation of the MMC Master panel.
- You can use the buttons to the left on the MMC Master panel to arm tape tracks for recording.
- The “A1, A2, TC, VD” items refer to additional tracks usually found on video tape recorders.
  Refer to the manual of your VTR device to see if these tracks are supported.

Machine Control Output Settings - 9-Pin Control 1 and 2



Serial Port

The two 9-Pin devices connect to your computer from available serial ports. Use the Serial Port pop-up menu to select the appropriate serial port.

IMPORTANT

PCs and Apple computers use different types of serial ports. PCs typically provide a RS232 interface on a 9-Pin Dsub connection that must be converted to RS422 in order to interface with Sony 9-Pin devices. Apple computers require a USB to RS422 serial converter such as the Keyspan USA-19W.

Audio Track Count

Use this option to specify how many audio tracks are available. The 9-Pin Device panel will then contain the same amount of record-enable buttons.

'Try to Recognize Device' vs. 'Use Generic Device'

The RS422 9-Pin protocol can control a wide variety of devices. Each device may have differing features. Nuendo has a library of device profiles that can be used with 9-Pin devices.

You can choose whether Nuendo will try to recognize the device by polling it and comparing that to its library, or you can use a generic device profile.

Auto Edit PRE/POST

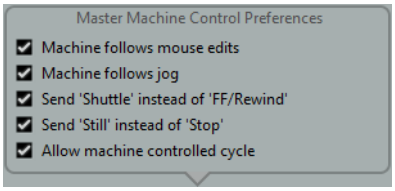
Auto Edit is a feature of 9-Pin devices that allows for automatic punch in and out on record-enabled tracks. The pre-roll and post-roll times determine where the 9-Pin device will start and stop playback during an Auto Edit procedure.

RELATED LINKS

9-Pin Auto Edit on page 1080

Master Machine Control Preferences

There are five preference settings for Nuendo's master machine control operation. They affect how the machine reacts to various commands from Nuendo.



Machine follows mouse edits

When this option is activated, moving the project cursor with the mouse results in transport commands so that the machine continuously locates to the new cursor position.

If this causes a great deal of unnecessary tape winding, you can deactivate the option. In that case transport commands are only sent to the machine when the mouse button is released.

Machine follows jog

When this option is activated, turning the jog wheel on the Transport panel or on a remote controller results in transport commands so that the machine continuously locates to the new project cursor position.

Again, this might cause a great deal of unnecessary tape winding. If disabled, transport commands are only sent to the machine when the user stops moving the wheel.

Send ‘Shuttle’ instead of ‘FF/Rewind’

Many video decks respond differently to Shuttle commands or FF/Rewind commands. FF/Rewind commands often result in the tape being released from the heads and the motors entering a high-speed wind mode. This takes a great deal of time, and the machine cannot read the timecode on the tape while winding. Therefore position information is lost. Activate this option if shuttle commands are preferred.

Send ‘Still’ instead of ‘Stop’

Similar to FF/Rewind commands, Stop commands result in the tape being released from the heads. Still commands on the other hand, also cause the transport to stop, but without releasing the tape from the heads. Activate this option if you want the picture from the video deck to be visible also in Stop mode or if you want the machine to enter playback mode faster.

Allow machine controlled cycle

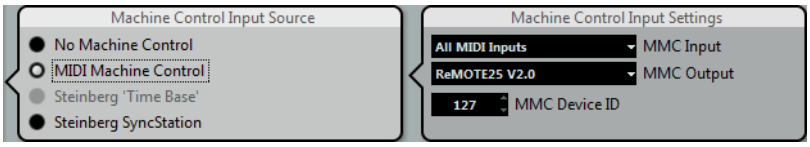
When this option is activated, Nuendo starts playback at the left locator minus the pre-roll time and stops playback at the right locator plus the post-roll time. When repeating a section, Nuendo locates back to the pre-roll position and waits for the machine to reach that position before issuing a start command.

If this option is deactivated, the machine will not follow when Nuendo cycles. Upon reaching the right locator, Nuendo locates back to the left locator, but the machine continues playback.

Machine Control Input Source

Nuendo can respond to machine control commands from external MIDI and 9-Pin devices.

Nuendo can follow incoming transport commands (locate, play, record) and respond to record-enabling commands for audio tracks. This allows Nuendo to easily integrate into larger studio systems with centralized machine control and synchronization such as theatrical mixing stages.



MIDI Machine Control

When MIDI Machine Control is selected as the input source, several settings become available in the Machine Control Input Settings section:

Option	Description
MMC Input	Set this to the MIDI input that is connected to the master machine control device.
MMC Output	Set this to the MIDI output that is connected to the master machine control device.
MMC Device ID	This determines the MIDI ID number that is used to identify the machine in Nuendo.

IMPORTANT

The MMC protocol involves polling devices (requesting information) for their status which requires two way communication. While some functions may work with only one way communication, it is best to connect both MIDI ports (input and output) of MMC devices.

Steinberg 'Time Base'

When the Time Base unit is connected to Nuendo, there are various settings for machine control input. Please refer to the documentation that comes with the Time Base for complete information on its use.

Steinberg SyncStation

When the SyncStation is selected as the machine control input source, there are several options for how these commands are routed within the SyncStation itself. Please refer to the documentation that comes with the SyncStation for complete information on its use.

RELATED LINKS

MMC Master panel on page 1075

MIDI Timecode Destinations

Nuendo can send MTC to any MIDI port. Use this section to specify the MIDI ports to which MTC is routed. Devices that can lock to MTC will chase Nuendo's timecode position.

NOTE

Some MIDI interfaces send MTC over all ports by default. If this is the case, only select one port of the interface for MTC.

MIDI Timecode Follows Project Time

Activate this option to ensure that the MTC output follows Nuendo's time position at all times including looping, locating, or jumping while playing. If not, MTC will continue on without changing locations at a loop or jump point until playback stops.

Timecode Offset

This option allows you to specify an offset to be applied to outgoing MTC. The amount of offset will be added or subtracted from the project's current position before being transmitted.

MIDI Clock Destinations

Some MIDI devices like drum machines can match their tempo and location to incoming MIDI clock. Select any MIDI ports that you wish to output MIDI clock.

MIDI Clock Follows Project Position

Activate this option to ensure that the MIDI clock device follows Nuendo when looping, locating, or jumping while playing.

NOTE

Some older MIDI devices might not respond well to these positioning messages and could take some time synchronizing to the new location.

Always Send Start Message

MIDI clock transport commands include Start, Stop, and Continue. However, some MIDI devices do not recognize the Continue command. By activating the "Always Send Start Message" option, you can avoid this problem with specific MIDI devices.

Send MIDI Clock in Stop Mode

Activate this option if you are working with a device that needs MIDI clock to run continuously in order to operate arpeggiators and loop generators.

Synchronized operation

Once you have connected all the devices that will be synchronized, it is important to understand how Nuendo operates in Sync mode. Sync mode is enabled by activating the Sync button on the Transport panel.

Sync mode

When you activate the Sync button, the following happens:

- Transport commands are routed to the machine control destination output as specified in the Project Synchronization Setup dialog.

  Locate, Play, Stop, and Record commands will now be sent to an external device.

- Nuendo awaits incoming timecode from the chosen timecode source defined in the Project Synchronization Setup dialog in order to play.

  Nuendo will detect incoming timecode, locate to its current position, and start playback in sync with the incoming timecode.

In a typical scenario, an external tape machine (e.g. a VTR) has its timecode output connected to Nuendo. Nuendo is sending machine control commands to the deck. When Sync is activated and you click Play on the Transport panel, a play command is sent to the VTR. The VTR in turn starts playback, sending timecode back to Nuendo. Nuendo then synchronizes to that incoming timecode.

If the “Machine follows mouse edits” option is activated and you change the project cursor position with the mouse or key command, machine control commands are sent to the remote deck so it will locate to the new position.

In this way, synchronized operation is somewhat invisible to the user. Just go about editing and mixing while the synchronized devices chase all movements of the cursor automatically.

IMPORTANT

With tape-based devices, synchronized operation will be slower due to the winding time necessary for the tape machine to locate to a new position.

Nuendo’s Edit Mode will take advantage of this feature by locating the VTR to the start of the first selected event. For more information about Edit Mode.

RELATED LINKS

About the Edit Mode on page 1111

9-Pin Auto Edit

Most 9-Pin devices such as VTRs have the capability of performing very accurate punch-ins and punch-outs on audio tracks. These punches are tied to video frames and are programmed using timecode. This type of recording is called an “Auto Edit”.

Nuendo can use its auto-punch feature to program Auto Edit functions of a VTR via 9-Pin control. The left and right locators in the Project window define the punch in and punch out of the Auto Edit. Provided that Nuendo is in Sync mode, pressing the Auto Edit button on the 9-Pin Device panel causes the punch-in to happen automatically.

NOTE

Auto Edits can only happen on a timecode frame. Punching in or out in between video frames is not possible.

IMPORTANT

In order to use the 9-Pin Device panel to control an external deck, the Online button must be activated and tracks must be armed.

Auto Edit Pre-Roll and Post-Roll

Since VTRs require some amount of pre-roll time in order to get tape up to speed for proper recording, each 9-Pin device has options for setting a pre-roll and post-roll amount in seconds.

The default values of 5 seconds pre-roll and 2 seconds post-roll should work in most cases. You can change these values in the “Machine Control Output Settings” section.

RELATED LINKS

Machine Control Output Settings - 9-Pin Control 1 and 2 on page 1075

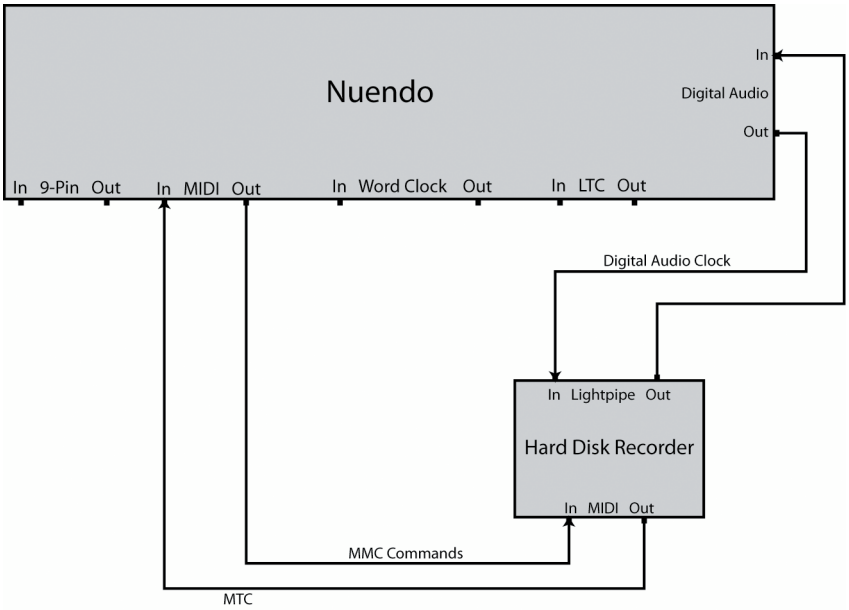
Example Scenarios

To better understand how synchronization options can be utilized, three example scenarios are provided.

Personal music studio

In a personal music studio, the user might have the need of synchronizing with an external recording device such as a portable hard disk recorder used for live remote recordings.

In this example, MIDI will be used for timecode and machine control while the audio clock will be handled by Lightpipe digital audio connections.



- When the Sync button is activated, Nuendo sends MMC commands to the hard disk recorder.

  Nuendo can remotely start playback of the recorder.

- The hard disk recorder is using audio clock from Nuendo's audio interface as the speed reference.

  It is also possible for Nuendo to use the audio clock from the recorder. The audio clock is carried over the Lightpipe digital audio connection that also carries audio signals.

- The hard disk recorder sends back MTC to Nuendo.

  When the recorder begins playing, MTC is sent back to Nuendo which will sync to that timecode.

Sync settings for personal music studio

To synchronize the devices in this example scenario, proceed as follows:

PROCEDURE

1. Make the connections as shown in the diagram above.

   In this simple example, any device that uses MTC can be substituted.

2. Open the Project Synchronization Setup dialog and select "MIDI Timecode" as the timecode source.

   When recording from the hard disk recorder into Nuendo, Nuendo will be the machine control master and the timecode slave, locking to incoming MTC.

3. In the "Machine Control Output Destination" section, select the "MIDI Machine Control" option.

   Nuendo will now send MMC commands to the hard disk recorder to locate and start playback.

4. In the “Machine Control Output Settings” section, assign the MIDI input and output ports that are connected to the hard disk recorder.

   Since MMC uses two-way communication, both MIDI ports should be connected. Be sure the MIDI filter does not echo SysEx data.

5. On the Transport panel, activate the Sync button.

   This routes transport commands to the hard disk recorder via MIDI and sets Nuendo as the timecode slave.

6. On the hard disk recorder, enable MMC and MTC.

   Follow the instructions on how to set up the unit to receive MMC commands and transmit MTC.

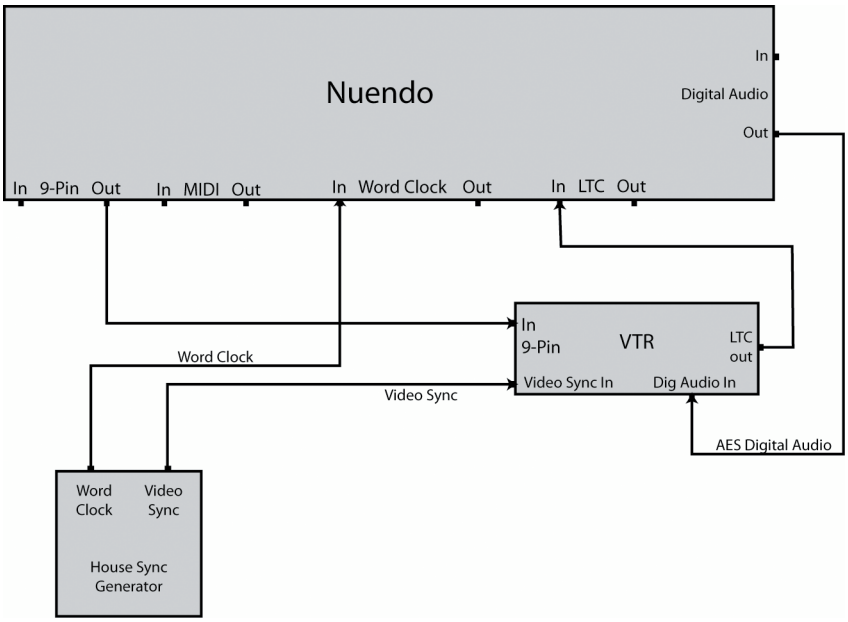
7. In Nuendo, click the Play button.

   The hard disk recorder should start playback and send MTC to Nuendo. Once Nuendo syncs to MTC, the status on the Transport panel should read “Lock” and show the current frame rate of incoming MTC.

Postproduction suite

In audio for video postproduction, synchronization needs are an everyday concern. Very often users need to synchronize with a 9-Pin VTR in order to work with video material. At the same time the audio clock has to be synchronized with the video clock source to ensure that both audio and video run at the same speed.

Finished audio can then be recorded back onto the digital audio tracks of a VTR in perfect sync with the video (known as a “layback”). In this example, 9-Pin machine control is used. The audio clock is a word clock signal generated by the house sync generator that also generates the video sync signal. Timecode is handled by a SMPTE to MTC reader (e. g. in the audio interface).



- The house sync generator creates both the video sync and audio word clock so that the VTR and Nuendo play at the same speed.

When laying back digital audio to the VTR, the AES signal will already be in sync with the VTR's digital audio inputs.

- 9-Pin machine control is used to manipulate the VTR's transport.

  The VTR can shuttle, locate, play, and record from commands issued by Nuendo. Also, Nuendo can arm audio tracks on the VTR for layback.

- When the VTR enters play, LTC is fed back to Nuendo which locks to that incoming timecode.

  If the LTC reader is part of an audio card that is APP compatible, sample-accurate synchronization is possible in this scenario.

Sync settings for audio layback in a postproduction suite

These steps outline the process of "laying back" finished audio to the VTR. To configure Nuendo for this example setup, proceed as follows:

PROCEDURE

1. Make the connections as shown in the diagram above.

   Ensure that video sync and word clock are tied to the same generating source!

2. Open the Project Synchronization Setup dialog and select either "ASIO Audio Device" or "MIDI Timecode" as the timecode source.

   Depending on your system's configuration, the sound card might have an LTC reader built into it or you may have to use a LTC to MTC converter interface to get timecode into Nuendo.

3. In the "Machine Control Output Destination" section, select 9-Pin Control 1 or 2.

   Nuendo's transport buttons will send commands to the VTR over the 9-Pin RS422 connection.

4. From the Devices menu, select the 9-Pin Device 1 or 2 option.

   Using the Auto Edit feature, you will be able to perform laybacks to the VTR via digital audio connections. VTRs with digital audio tracks use 48kHz as a standard sampling rate. Some decks only have 20 bit depth capacity so make sure to dither properly for the intended delivery format.

5. Click the Online button.

   Now you can use the device panel to control the VTR.

6. Test the transport with the 9-Pin Device panel.

   Ensure that all connections are working properly by testing the various transport buttons on the 9-Pin Device panel.

7. Record-enable the audio tracks that you wish to record to.

   Most professional VTRs have four audio tracks. Many high-definition VTRs have eight for recording 6-channel surround sound plus a stereo downmix all on the same tape.

8. Play back the project and look at the meters on the VTR to ensure that proper recording levels are set.

   That way you can also make sure that the digital audio connections are working properly.

9. Set the left and right locators to the punch in and punch out points.

   Auto Edit uses the left and right locators to program the record in and out points of the VTR.

10. Ensure that the pre-roll and post-roll times are appropriate for the VTR.

    In most cases, the default values will be sufficient for the VTR to get up to speed before punching in.

11. On Nuendo's Transport panel, activate the Sync button.

    This turns Nuendo into a timecode slave. Once the VTR starts to play, Nuendo will sync to incoming timecode.

12. On the 9-Pin Device panel, click the Auto Edit button.

    This starts the Auto Edit process. The tape transport locates to the set pre-roll position (by default, 5 seconds before the left locator) and starts playback. When the left locator is reached, the VTR enters record mode.

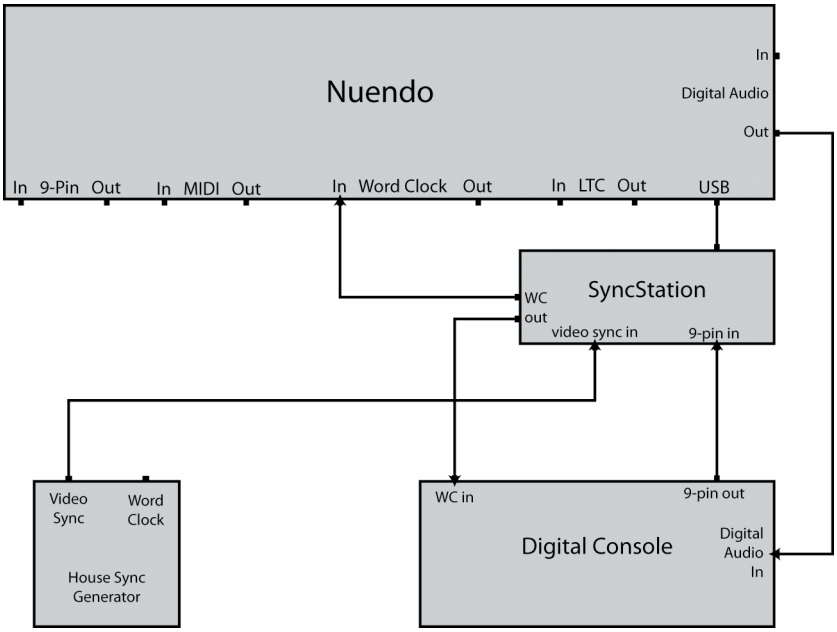
13. The Auto Edit is complete when the right locator is reached and the VTR goes out of record.

    After reaching the right locator, the VTR continues playing for the set post-roll time (by default 2 seconds) before it stops.

Theatrical mixing stage

A theatrical mixing stage (also known as a dub stage) is a large theater-sized room used to create the final mixdown for feature films that will be presented in theaters with surround sound. These types of studios are very complex, dealing with hundreds of audio tracks at once through large mixing consoles along with high-quality video and film playback systems.

In this example, Nuendo is only one part of a very large system of devices that need to be perfectly synchronized with one another. An external master 9-Pin controller will operate the transport of the entire system remotely from the console and timecode will be handled via 9-Pin interface through the SyncStation. The audio clock will be referenced to tri-level HD video sync fed to the SyncStation which will output dedicated word clock to both Nuendo and the digital console.



- Audio clock is generated out of the video reference signal.

  In this example, video sync is being fed to the SyncStation as both a speed reference and a phase reference. Word clock goes from the SyncStation to Nuendo and the digital console.

- The console is the machine control master, sending 9-Pin control commands and status messages to the SyncStation.

  The console controls the playback in Nuendo via the SyncStation. Nuendo is the timecode slave. The SyncStation is acting as a machine control slave.

- Timecode is fed to the SyncStation via 9-Pin and then via a USB connection to Nuendo (as MTC).

  The SyncStation's 9-Pin interface is capable of using 9-Pin timecode effectively for accurate synchronization. Direct serial port 9-Pin connections should not be used this way.

Sync settings for a theatrical mixing stage

To configure Nuendo for this example setup, proceed as follows:

PROCEDURE

1. Make the connections as shown in the diagram above.

   In this example, the SyncStation handles many of the synchronization tasks. Please refer to the documentation that comes with the SyncStation for complete information on its operation.

2. Open the Project Synchronization Setup dialog and select the SyncStation as the timecode source.

   The SyncStation sends MTC over the USB connection to Nuendo. The SyncStation will use its "Virtual Master" mode to generate timecode.

3. In the “Machine Control Input Source” section, select the SyncStation option.

   Provided that the SyncStation is set to route record and track arming commands to Nuendo, this will allow the digital console to record-enable audio tracks in Nuendo and enter record mode via 9-Pin commands sent to the SyncStation.

4. On the Transport panel, activate the Sync button.

   Nuendo will await incoming timecode from the SyncStation.

5. Test the record-enable buttons on the console.

   If configured properly, the corresponding audio tracks in Nuendo become record-enabled.

6. Press play on the console’s transport control.

   This will send the play commands to the SyncStation over 9-Pin and the SyncStation will start generating timecode to synchronize Nuendo.

Working with VST System Link

VST System Link is a network system for digital audio that allows you to have several computers working together in one large system. Unlike conventional networks it does not require Ethernet cards, hubs, or CAT-5 cables; instead it uses the kind of digital audio hardware and cables you probably already possess in your studio.

VST System Link has been designed to be simple to set up and operate, yet give enormous flexibility and performance gains in use. It is capable of linking computers in a “ring” network (the System Link signal is passed from one machine to the next, and eventually returns to the first machine). VST System Link can send its networking signal over any type of digital audio cable, including S/PDIF, ADAT, TDIF, or AES, as long as each computer in the system is equipped with a suitable ASIO compatible audio interface.

Linking up two or more computers gives you vast possibilities:

- Dedicate one computer to running VST instruments while recording audio tracks on another.
- If you need lots of audio tracks, you may simply add tracks on another computer.
- You could have one computer serve as a “virtual effect rack”, running CPU-intensive send effect plug-ins only.
- Since you can use VST System Link to connect different VST System Link applications on different platforms, you can take advantage of effect plug-ins and VST instruments that are specific to certain programs or platforms.

Requirements

The following equipment is required for VST System Link operation:

- Two or more computers.

  These can be of the same type or use different operating systems – it does not matter. For example, you can link an Intel-based PC to an Apple Macintosh without problems.

- Each computer must have audio hardware with specific ASIO drivers.
- The audio hardware must have digital inputs and outputs.

  To be able to connect the computers, the digital connections must be compatible (i.e. the same digital formats and connection types must be available).

- At least one digital audio cable must be available for each computer in the network.
- A VST System Link host application must be installed on each computer.

  Any VST System Link application can connect to another.

Additionally, use of a KVM switchbox is recommended.

Using a KVM switchbox

Whether you want to set up a multi-computer network or a small network in a limited space, it is a good idea to invest in a KVM (Keyboard, Video, Mouse) switchbox. With one of these you can use the same keyboard, monitor, and mouse to control each computer in the system, and you can switch between computers very rapidly. If you decide not to go this route, the network will function just the same, but you may end up doing a lot of jumping from one machine to the other while setting up!

Making connections

Below, we assume that you are connecting two computers. Should you have more than two computers, it is still best to start with two and add the others one by one once the system is working – this makes troubleshooting easier if you run into problems. For two computers, you will need two digital audio cables, one in each direction:

PROCEDURE

1. Use the first digital audio cable to connect the digital output of computer 1 to the digital input of computer 2.
2. Use the other cable to connect the digital output of computer 2 to the digital input of computer 1.

   If a card has more than one set of inputs and outputs, choose whichever one that suits you – for simplicity usually the first set is best.

Synchronization

Before you proceed, you need to make sure that the clock signals on your ASIO cards are synchronized correctly. This is essential when cabling any kind of digital audio system, not just VST System Link.

IMPORTANT

All digital audio cables by definition always carry a clock signal as well as audio signals, so you do not have to use a special word clock input and output for this (although you may find that you get a slightly more stable audio system if you do, especially when using multiple computers).

The clock mode or sync mode is set up in the ASIO control panel of the audio hardware. Proceed as follows:

PROCEDURE

1. From the Devices menu, open the Device Setup dialog.
2. On the VST Audio System page, select your audio interface from the ASIO Driver pop-up menu.

   In the Devices list, the name of the audio interface now appears as a subentry to the “VST Audio System” entry.
3. In the Devices list, select your audio interface.
4. Click the Control Panel button.

   The ASIO control panel appears.
5. Open the ASIO control panel on the other computer as well.

   If you are using another VST System Link host application on that computer, check its documentation for details on how to open the ASIO control panel.
6. Now you need to make sure that one audio card is set to be the clock master and all other cards are set to be clock slaves (i.e. they listen for the clock signal coming from the clock master).

   The naming and procedure for this differs depending on the audio hardware – consult its documentation if required. If you are using Steinberg Nuendo ASIO hardware, all cards default to the AutoSync setting. In this case you must set one of the cards (and only one) to “Master” in the Clock Mode section of the control panel.

RESULT

Typically, the ASIO control panel for an audio card contains some indication of whether or not the card receives a proper sync signal, including the sample rate of that signal.

This is a good indication that you have connected the cards and set up clock sync properly. Check your audio hardware’s documentation for details.

IMPORTANT

It is very important that only one card is the clock master, otherwise the network cannot function correctly. Once you have set this up, all the other cards in the network will take their clock signal from this card automatically.

The only exception to this procedure is if you are using an external clock – from a digital mixing desk or a special word clock synchronizer, for example. In that case you must leave all your ASIO cards in clock slave or AutoSync mode and make sure that each of them is listening for the signal coming from the synchronizer. This signal is usually passed through your ADAT cables or word clock connectors in a daisy chain fashion.

VST System Link and latency

The general definition of latency is the amount of time it takes any system to respond to whatever messages are sent to it. For example, if your system's latency is high and you play VST instruments in realtime, you will get a noticeable delay between when you press a key and when you hear the sound of the VST instrument. Nowadays, most ASIO-compatible audio cards are capable of operating with very low latencies. Also, all VST applications are designed to compensate for latency during playback, making the playback timing tight.

However, the latency time of a VST System Link network is the total latency of all the ASIO cards in the system added together. Therefore it is extra important to minimize the latency times for each computer in the network.

IMPORTANT

The latency does not affect the synchronization – it is always perfectly in time. But it can affect the time it takes to send and receive MIDI and audio signals, or make the system seem sluggish.

To adjust the latency of a system, you adjust the size of the buffers in the ASIO control panel – the lower the buffer size, the lower the latency. It is best to keep to fairly low latencies (buffer sizes) if your system can handle it – about 12 ms or less is usually a good idea.

Setting up your software

Now it is time to set up your programs. The procedures below describe how to set things up in Nuendo. If you are using another program on the other computer, please refer to its documentation.

Setting the sample rate

The projects in both programs must be set to use the same sample rate. Select "Project Setup…" from the Project menu and make sure that the sample rate is the same in both systems.

Streaming digital audio between applications

PROCEDURE

1. Create input and output busses in both applications and route these to the digital inputs and outputs.

   The number and configuration of the busses depend on your audio hardware and on your needs. If you have a system with eight digital i/o channels (such as an ADAT connection), you could create several stereo or mono busses, a surround bus together with a stereo bus, or any combination you need. The important thing is that you should have the same configuration in both applications – if you have four stereo output busses on computer 1, you want four stereo input busses on computer 2, etc.

2. Set things up so that computer 1 plays back some audio.

   For example, you could import an audio file and play it back in Cycle mode.

3. In the Inspector or MixConsole, make sure that the channel containing the audio material is routed to one of the digital output busses.

4. On computer 2, open the MixConsole and locate the corresponding digital input bus.

   The audio being played back should now “appear” in the program running on computer 2. You should see the input bus level meters moving.

5. Reverse this procedure so that computer 2 plays back and computer 1 “listens”.

RESULT

Now you have verified that the digital connection works as it should.

NOTE

From this point on in this chapter, we refer to the busses connected to the digital inputs and outputs as “VST System Link busses”.

Settings for the audio hardware

When you exchange VST System Link data between computers, it is important that the digital information is not changed in any way between the programs. Therefore, you should open the control panel (or additional application) for your audio hardware and make sure that the following conditions are met:

- If there are additional “format settings” for the digital ports that you use for VST System Link data, make sure that these are turned off.

  For example, if you are using an S/PDIF connection for VST System Link, make sure that “Professional format”, Emphasis, and Dithering are turned off.

- If your audio hardware has a mixer application allowing you to adjust the levels of digital inputs and outputs, make sure that this mixer is disabled or that the levels for the VST System Link channels are set to ±0dB.

- Similarly, make sure no other forms of DSP (pan, effects, etc.) are applied to the VST System Link signal.

Notes for Hammerfall DSP users

If you are using RME Audio Hammerfall DSP audio hardware, the Totalmix function allows for extremely complex signal routing and mixing in the audio hardware. This can in some situations lead to “signal loops” in which case the VST System Link will not work. If you want to make absolutely sure this will not cause any problems, select the default or “plain” preset for the Totalmix function.

Activating VST System Link

Before you proceed, you need to make sure that VST System Link is set as the timecode source in the Project Synchronization Setup dialog and that the desired Sync options are activated.

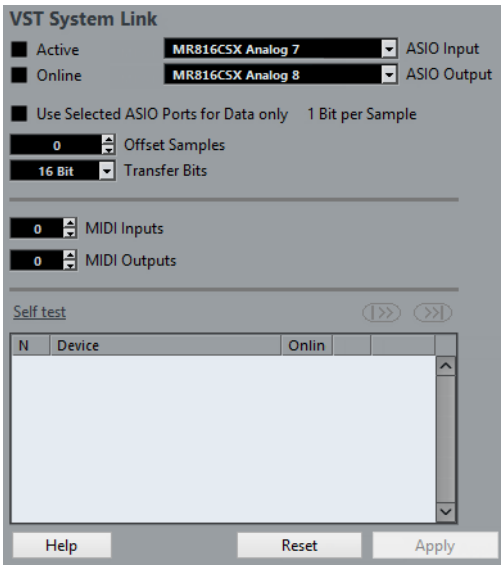
After setting up the inputs and outputs, you now need to define which input/output will carry the actual VST System Link information.

The VST System Link networking signal is carried on only one bit of one channel. This means that if you have an ADAT-based system which normally carries eight channels of 24-bit audio, once you activate VST System Link you will have seven channels of 24-bit audio and one channel of 23-bit audio (the least significant bit of this last channel will be used for networking). In practice this makes no discernible difference to the audio quality, since you will still have around 138 dB headroom on this channel.

To set things up, open the VST System Link panel:

PROCEDURE

1. From the Devices menu, open the Device Setup dialog.
2. In the Devices list to the left, select the “VST System Link” entry.
   The VST System Link settings are shown to the right of the Devices list.



3. Use the ASIO Input and ASIO Output pop-up menus to define which channel is the networking channel.

4. Activate the Active checkbox at the top left of the panel.
5. Repeat the steps above for every computer in the network.

RESULT

As the computers are made active, you should see the Sending and Receiving indicators flashing on each active computer, and the name of each computer should appear in the list at the bottom of the pane. Each computer is assigned a random number – do not worry about this, it is just so the network knows internally which one is which.

- You can double-click on the name in bold (which is the name of the computer you are currently working on) and set it to whatever other name you wish.

  This name will appear in the VST System Link window of every computer on the network.

NOTE

If you do not see the name of each computer appearing once you have made it active, you need to check your settings. Go through the procedure above again and make sure that all ASIO cards are listening to the digital clock signals correctly, and that each computer has the correct inputs and outputs assigned to the VST System Link network.

RELATED LINKS

Timecode Preferences on page 1072

Putting the network online

After each computer's name you will see whether it is online or not. When a computer is online, it will receive transport and timecode signals, and its sequencer application can be started and stopped by remote control. If it is off-line, it can only be started from its own keyboard – it is effectively an independent machine, although it is still on the network.

NOTE

Note that any computer can control any and all of the others – VST System Link is a peer-to-peer network and there is no absolute "master" computer.

To put all computers online, proceed as follows:

PROCEDURE

1. For all computers, activate the Online checkbox on the VST System Link page.
2. Start playback on one computer to check that the system is working – all computers should start almost instantly and play perfectly in time, with sample-accurate precision.

- The Offset Samples setting allows you to adjust whether one machine will play slightly ahead or behind the rest.

  This is normally not needed, but occasionally with some hardware you may find that the lock is a few samples out. For now, leave it set to 0 – it will most likely be what you want.
- The Transfer Bits setting allows you to specify whether you want to transfer 24 or 16 bits. This allows you to use older audio cards which do not support transfer of 24 bits.

RESULT

VST System Link sends and understands all transport commands (such as play, stop, fast forward, rewind, etc.). This allows you to control the entire network from one computer without a problem – try it! If you jump to a locator point on one machine, all other machines will also instantly jump to that locator point.

IMPORTANT

Make sure that all computers have their tempos set to the same value, otherwise your synchronization will be seriously skewed.

Scrubbing via VST System Link

You can scrub on one computer and have the video and audio on another computer scrub along. However, the playback on the linked systems may not be perfectly in sync while scrubbing and there are some further restrictions you should bear in mind when scrubbing via VST System Link:

- Use the jog/shuttle control on the Transport panel or a remote controller for scrubbing.

  Scrubbing with the Scrub tool does not work over a VST System Link connection.
- Always use the system where you started scrubbing to control the scrubbing, e.g. change the scrub speed or stop scrubbing.

  Changing the scrub speed on a remote system will only change the speed on the local system.
- You can start playback on all systems.

  This stops scrubbing and enters playback on all systems in sync.

Using MIDI

As well as supplying transport and sync control, VST System Link also supplies up to 16 MIDI ports, with 16 channels each.

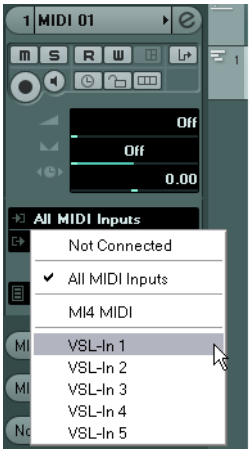
PROCEDURE

1. Use the MIDI Inputs and MIDI Outputs value fields to specify the number of MIDI ports you need.

   The default value is 0 MIDI In and 0 MIDI Out ports.

2. In the Project window, create a MIDI track and open the Inspector (top section).

3. If you now open the Input or Output Routing pop-up menu, you will find the specified System Link ports added to the list of MIDI inputs or outputs.



This allows you to route MIDI tracks to VST instruments running on another computer, as described in the application examples.

RELATED LINKS

Using one computer for VST instruments on page 1098

The “Use Selected ASIO Ports for Data only” setting

If you are sending huge amounts of MIDI data at once, there is a small possibility that you might run out of bandwidth on your VST System Link network. This will manifest itself by notes “choking” or timing becoming erratic.

If this happens, you can devote more bandwidth to MIDI by activating the “Use Selected ASIO Ports for Data only” option on the VST System Link page of the Device Setup dialog. When this is activated, the VST System Link information will be sent on the entire channel instead of just one bit, more than enough for all the MIDI you could ever hope to use. The downside is that you can no longer use this ASIO channel for audio transfer (do not connect it to a speaker!), thus leaving you with only 7 audio channels in our ADAT cable example. Depending on how you work, this might be a reasonable compromise.

Hearing the network audio

If you are using an external mixing desk, hearing your audio really is not an issue – just plug the outputs of each computer into the desired channels on the external mixing desk, start playback on one of the computers, and you are good to go.

However, many people prefer to mix internally inside the computer and just use a desk for monitoring (or maybe not use any external mixer at all). In this case you will need to select one computer to be your "main mix computer" and send the audio from your other computers into this.

In the following example, we assume you are using two computers, with computer 1 as your main mix computer and computer 2 running two additional stereo audio tracks, an FX channel track with a reverb plug-in and a VST instrument plug-in with stereo outputs.

PROCEDURE

1. Set things up so that you can listen to the audio playback from computer 1.

   In other words, you need an unused set of outputs, e.g. an analog stereo output, connected to your monitoring equipment.
2. On computer 2, route each of the two audio tracks to a separate output bus.

   These should be busses connected to the digital outputs – let's call them Bus 1 and 2.
3. Route the FX channel track to another VST System Link bus (Bus 3).
4. Route the VST instrument channel to yet another bus (Bus 4).
5. Go back to computer 1 and check the corresponding four VST System Link input busses.

   If you start playback on computer 2, the audio should "appear" on the input busses on computer 1. However, to mix these audio sources you need actual mixer channels.
6. Add four new stereo audio tracks on computer 1 and route these to the output bus you use for listening, e.g. to the analog stereo outputs.
7. For each of the audio tracks, select one of the four input busses.

   Now, each computer 2 bus is routed to a separate audio channel on computer 1.
8. Activate monitoring for the four tracks.

RESULT

If you now start playback, the audio from computer 2 will be sent "live" to the new tracks on computer 1, allowing you to hear them together with any tracks you play back on computer 1.

Adding more tracks

What if you have more audio tracks than you have VST System Link busses (physical outputs)? Then you just use the computer 2 mixer as a submixer: Route several audio channels to the same output bus and adjust the output bus level if needed.

NOTE

If your audio cards have multiple sets of input and output connections, you can link up multiple ADAT cables and send audio via any of the busses on any of the cables.

Internal mixing and latency

One problem with mixing inside the computer is the latency issue we mentioned earlier. The VST engine always compensates for record latencies, but if you are monitoring through computer 1 you will hear a processing delay while you listen to signals coming from your other computers (not on your recording!). If your audio card in computer 1 supports ASIO Direct Monitoring you should definitely turn this on. You can find the setting on the VST Audio System device panel for your hardware. Most modern ASIO cards support this function. If yours does not, you may want to change the Offset Samples value on the VST System Link page to compensate for any latency issues.

RELATED LINKS

ASIO Direct Monitoring on page 244

Setting up a larger network

Setting up a larger network is not much more difficult than a two-computer network. The main thing to remember is that VST System Link is a daisy chain system. In other words, the output of computer 1 goes to the input of computer 2, the output of computer 2 goes to the input of computer 3, and so on around the chain. The output of the last computer in the chain must always go back into the input of computer 1, to complete the ring.

Once you have done this, the transmission of all the transport, sync, and MIDI information to the whole network is handled pretty much automatically. However, where you may run into confusion in a large network is in the transmission of audio signals back to a central mix computer.

If you have lots of hardware inputs and outputs on your ASIO cards, you do not have to send audio via the chain at all, but can transmit it directly to the master mix computer via one or more of its other hardware inputs. For example, if you have a Nuendo Digiset interface or 9652 card on computer 1, you could use ADAT cable 1 for networking, ADAT cable 2 as a direct audio input from computer 2, and ADAT cable 3 as a direct audio input from computer 3.

You can also transmit audio via the ring system if you do not have enough hardware I/Os for direct audio transmission. For example, in a four-computer scenario you could send audio from computer 2 into a channel in the mixer in computer 3, from there to a channel in the mixer in computer 4, and from there back to the master mixer in computer 1. This can certainly be tricky to set up, so for complex networks it is generally recommended to use ASIO cards with at least three separate digital I/Os.

Application examples

Using one computer for VST instruments

In this example, one computer will be used as main record and playback machine, and another computer as a virtual synth rack.

PROCEDURE

1. Record a MIDI track into computer 1.
2. Once you have finished recording, route the MIDI output of that track to VST System Link MIDI port 1.
3. On computer 2, open up the VST Instruments window and assign an instrument to the first slot in the rack.
4. Route the VST instrument channel to the desired output bus.

   If you are using computer 1 as your main mixing computer, this would be one of the VST System Link output busses, connected to computer 1.
5. Create a new MIDI track in the Project window of computer 2 and assign the MIDI output of the track to the VST instrument you created.
6. Assign the MIDI input of the track to be VST System Link port 1.

   Now, the MIDI track on computer 1 is routed to the MIDI track on computer 2, which in turn is routed to the VST instrument.
7. Now activate monitoring for the MIDI track on computer 2, so that it will listen and respond to any MIDI commands coming in.

   In Nuendo, click the Monitor button in the track list or Inspector.
8. Start playback on computer 1.

   It will now send the MIDI information on the track to the VST instrument loaded on computer 2.

RESULT

Even with a slow computer you should be able to stack a whole bunch of extra VST instruments this way, expanding your sound palette considerably. Do not forget that VST System Link MIDI is also sample-accurate, and thus has much tighter timing than any hardware MIDI interface ever invented!

Creating a virtual effect rack

The effect sends for an audio channel in Nuendo can either be routed to an FX channel track or to any activated group or output bus. This allows you to use a separate computer as a “virtual effect rack”.

PROCEDURE

1. On computer 2 (the machine you will use as effect rack), add a new stereo audio track.

   You cannot use an FX channel track in this case, since the track must have an audio input.

2. Add the desired effect as an insert effect for the track.

   Let's say you add a high-quality reverb plug-in.

3. In the Inspector, select one of the VST System Link busses as input for the audio track.

   You want to use a separate VST System Link bus, which will only be used for this purpose.

4. Route the channel to the desired output bus.

   If you are using computer 1 as your main mixing computer, this would be one of the VST System Link output busses, connected to computer 1.

5. Activate monitoring for the track.
6. Go back to computer 1 and select a track to which you want to add some reverb.
7. Bring up the effect sends for the track in the Inspector or the MixConsole.
8. Open the Send Routing pop-up menu for one of the sends and select the VST System Link bus assigned to the reverb in step 3.
9. Use the Send slider to adjust the amount of effect as usual.

RESULT

The signal will be sent to the track on computer 2 and processed through its insert effect, without using any processor power on computer 1.

You can repeat the steps above to add more effects to the "virtual effect rack". The number of effects available this way is only limited by the number of ports used in the VST System Link connection (and of course by the performance of computer 2, but given that it will not have to handle any recording or playback, you should be able to use quite a lot of effects).

Getting extra audio tracks

All computers on a VST System Link network are locked with sample-accuracy. Therefore, if you find that the hard drive on one computer is not fast enough to run as many audio tracks as you need, you can record new tracks on one of the other computers instead. This would create a "virtual RAID system", with several disks all operating together. All tracks will remain locked together just as tightly as if they were all running on the same machine. This means that you effectively have an unlimited track count! Need another 100 tracks? Just add another computer.

Dedicated Video Playback

Playback of high-resolution video can be taxing on a system's CPU. By dedicating one computer for video playback via System Link, you can free up resources on your main CPU for audio and MIDI processing. Since all transport commands will respond on the VST System Link computers, scrubbing video is possible even when it is coming from another computer. Spotting sound effects to picture in Edit Mode will work the same way as it does on one computer. This is a viable and economic alternative to dedicated hard disk video systems like the Doremi V1.

Video

Nuendo is a full-featured postproduction media tool that is capable of dealing with video content in several ways.

You can work with video and create complete soundtracks from within Nuendo. The soundtrack can then be inserted into a video file, recorded onto video tape or exported as an audio file that can be married to the video or film later. This chapter covers the video operations related to the video itself, like importing video files, playing back video, and applying speed changes to compensate for film transfers.

RELATED LINKS

Audio editing to picture on page 1144

Before You Start

When working on a project involving a video file, you first need to set up your system according to your equipment and your demands.

The following sections provide some general information about video file formats, frame rates, and video output devices.

Video File Compatibility

Because there are many types of video files, it can be difficult to determine if one will work on your system.

There are two ways to figure out if Nuendo can play back a certain video file:

- Open the video file with QuickTime 7.1 or higher, because Nuendo uses QuickTime for playing back video files.
- Check the file information of a video file in the Pool. If the information reads “Invalid or not supported file!”, the video file is either corrupt or the format is not supported by the available codecs.

NOTE

If you are not able to load a certain video file, you must use an external application to convert the file into a compatible format or install the required codec.

RELATED LINKS
Codecs on page 1101

Video Container Formats

Video and other multi-media files come in a container format.

This container holds various streams of information including video and audio, but also metadata such as synchronization information required to play back audio and video together. Data regarding creation dates, authors, chapter markings, and more can also be held within the container format.

The following container formats are supported by Nuendo:

Format	Description
MOV	This is a QuickTime movie.
QT	This is also a QuickTime movie, but it is only used on Windows systems.
MPEG-1	This is the first standard of the Moving Picture Experts Group for video and audio compression, used for making video CDs. Files of this container format can have the extensions “.mpg” or “.mpeg”.
MPEG-2	This container format is used for DVD authoring. It can also contain AC3 multi-channel audio and has the file extension “.m2v”.
VOB	This format is used for DVD video and is based on MPEG-2, but has additional limitations and specifications.
MPEG-4	This format is based on the QuickTime movie standard, can contain various metadata for streaming, editing, local playback, and interchange of content. Its file extension is “.mp4”.
AVI	This format is a multimedia container format introduced by Microsoft.
DV	This is a video format used by camcorders.

Nuendo supports all these container formats, but problems may arise when the computer does not have the correct software to decode compressed video and audio streams within the container file. You must also know the type of codec that was used to create the video file.

Codecs

Codecs are methods of data compression used to make video (and audio) files smaller and more manageable for computers.

In order to play back a video file, your computer must have the correct codec installed in the operating system to decode the video stream.

IMPORTANT

The names of codecs and container formats can be confusing. Because many container formats have the same names as the codecs they use within the file, make sure to differentiate the container format or file type, for example .mov or .dv, from the codec used within it.

If you are not able to load a certain video file, the required codec is probably not installed on your computer. In this case, you can search the internet (e.g. the Microsoft or Apple web sites) for video codecs.

Frame Rates

Nuendo is capable of working with different types of video and film frame rates.

RELATED LINKS

Frame rate (speed) on page 1064

Video Output Devices

Nuendo supports several ways to play back video files.

Viewing video files onscreen in the Video Player window may work just fine for many applications, but often it is necessary to display video in a large format for viewing small details and so others involved in the session can also see the video. Nuendo provides the ability to use several types of video output devices to accomplish this.

Multi-Head Video Cards

One of the most common methods is the use of a multi-head video card installed in the computer.

Multi-head video cards allow you to connect more than one computer monitor to the card, in some cases up to four. If you direct the video output of Nuendo to one of these outputs, the video file is displayed in full screen mode on a computer monitor or HD television screen.

NOTE

You can also use more than one video card to achieve the same result. The use of two dual display cards in one system (a total of four monitors) is a very common setup for film postproduction systems. One output is dedicated to video and the other three can be used for Nuendo and other applications.

Different video cards support different types of outputs including standard VGA, DVI, S-Video, HDMI, and component video. These options allow you to choose the type of monitor you use for video. HD televisions and digital projectors provide the largest viewing screens, but a normal computer monitor can function as a very high-quality video monitor as well.

Dedicated Video Cards

The use of a dedicated video card is also supported in Nuendo.

These cards are normally used in video editing systems to capture video to disk and display it while editing. They usually have a high resolution and take some strain off the host CPU by providing video compression and decompression processing on the card.

NOTE

The Decklink cards by Blackmagic Design are automatically recognized by Nuendo. Video will be sent directly to its output.

FireWire DV Output

You have the option to use FireWire ports on the computer to output DV video streams to external converters such as various camcorders and standalone FireWire to DV conversion units.

These units can be connected to a television or projector for large format viewing. The FireWire protocol is capable of transporting data at high speed and is the most common standard for communicating with video-related peripheral equipment.

IMPORTANT

On Windows systems, it is important that you connect your device to the FireWire port before launching Nuendo. Otherwise it may not be detected properly by Nuendo.

Preparing a Video Project

The following sections describe the basic operations necessary for preparing a Nuendo project involving video.

It is advisable to save your video files on a separate hard drive from your audio files. This can help prevent data streaming problems when using high-resolution video with many audio tracks.

Importing Video Files

Importing a video file into your project is very straight forward once you know that you have a compatible video file.

Video files are imported in the same manner as audio files:

- By using the File menu (Import–Video File).

In the Import Video dialog, you can activate the “Extract Audio From Video” option. This imports any embedded audio streams to a newly created audio track positioned below the video track. The new track and the clip will get the name of the video file. The new audio event will start at the same time as the video event, so that they are in sync with each other.

NOTE

If you try to import a non-supported video file with the Import Video option, the Import Video dialog displays the text “Invalid or not supported file!”.

- By importing to the Pool first and then dragging to the Project window.
- By using drag and drop from the MediaBay, the Pool, the Windows Explorer, or the Mac OS Finder.

When importing video files via the Pool or by using drag and drop, Nuendo can automatically extract the audio from a video file. Whether this happens, depends on the “Extract Audio on Import Video File” setting in the Preferences dialog (Video page).

When importing video, Nuendo automatically creates a thumbnail cache file. The generated file is stored in the same folder as the video file and gets the name of the file with the suffix “.vcache”.

IMPORTANT

In Nuendo, you may work with multiple video files of differing frame rates and formats on the same video track. There can be two video tracks per project. Assuming you have the proper codecs installed, all video files can be played back in one project, but note that proper synchronization of audio and video events is ensured only if the frame rate of the video file matches the project frame rate.

RELATED LINKS

Pool on page 572
Extracting Audio From a Video File on page 1111

Adopting the Frame Rate

When using video files within Nuendo, it is important to adjust the project’s frame rate to that of the imported video. This ensures that the time displays of Nuendo correspond to the actual frames in the video. If the frame rate of an imported video file differs from the frame rate set for the project, the video event shows a warning.

In order to match the two frame rates, you have to adjust the frame rate in the Project Setup dialog.

PROCEDURE

1. Open the Project menu and select “Project Setup...”.
2. In the Project Setup dialog, click the “Get From Video” button.

   Provided that the video file has a frame rate supported by Nuendo, it is automatically detected and applied to the project. If the project contains several video files with different frame rates, the project frame rate is adjusted to the frame rate of the first video event on the upper video track.

RESULT

The project frame rate setting will change to that of the video file and the project start time will be altered to reflect the change in frame rate if needed.

For example, when the project frame rate is switched from 30 fps to 29.97 fps, the start time is changed so that all the events currently in the project remain at the same positions in relation to realtime. If you want the project start time to remain the same, you must manually change it back after clicking the “Get From Video” button. In this case, it is important that the video event is snapped to the timeline to ensure proper positioning and synchronization within the project.

NOTE

- Nuendo can only detect the supported frame rates (these are the frame rates listed in the Frame Rate pop-up menu in the Project Setup dialog). Video files with non-supported frame rates can be played back, but the time displays are not correct in this case and proper positioning is not guaranteed. Furthermore, audio and video may not be in sync. Therefore, we recommend that you use an external application to convert the video file to a frame rate supported by Nuendo.
- If you have more than one video file in a project, it is advisable that all video files have the same frame rate consistent with the project frame rate. Nevertheless, you can work with multiple video files of differing frame rates, but in this case you should always change the project frame rate to the frame rate of the video file that you are editing at the moment. This is done in the Project Setup dialog by selecting the correct frame rate from the Frame Rate pop-up menu.

About Thumbnails

The individual thumbnail images are positioned exactly at the beginning of the corresponding frame.

When you zoom in and there is enough space between the frames, the thumbnail is repeated as many times as there is free space available. Thus, you can always see a thumbnail regardless of how much you zoom in.

Thumbnail Memory Cache Size

In the Preferences dialog on the Video page, you can enter a value for the “Thumbnail Memory Cache Size”. This determines how much memory is available for displaying “real” thumbnails. The currently shown image is buffered in the thumbnail memory cache. Whenever you move to another image and there is no memory capacity left, the “oldest” picture in the cache is replaced by the current one. If you have long video clips and/or work with a large zoom factor, you may have to raise the “Thumbnail Memory Cache Size” value.

About thumbnail cache files

When importing video, Nuendo automatically creates a thumbnail cache file. The cache file is used in situations where the processor load is very high and the correct redrawing or realtime calculation of thumbnails might use system resources necessary for editing or processing. When you zoom in on the thumbnails, you see that they are in a lower resolution, i.e. the pictures are not as clear as when they are calculated. When the processes that rely heavily on the computer CPU are finished, the frames are automatically recalculated, i. e. the program automatically switches between realtime calculation of the pictures and using the cache file.

NOTE

There are situations where no thumbnail cache file can be generated, e.g. if you import a video file from a folder that is write-protected. If you have access to the host folder at a later stage, you can generate a thumbnail cache file manually.

Manually Generating Thumbnail Cache Files

If no thumbnail cache file could be generated during import or if you have to “refresh” a thumbnail cache file of a certain video file, because the file has been edited with an external video editing application, you have the possibility to generate the thumbnail cache file manually.

To create a thumbnail cache file manually, you have the following possibilities:

- In the Pool, right-click on the video file that you want to create a thumbnail cache file for and select the “Generate Thumbnail Cache” option from the context menu.

  A thumbnail cache file is created, or, in case there already existed a thumbnail cache file for the video file, it is “refreshed”.

- In the Project window, open the context menu for the video event, and select “Generate Thumbnail Cache” from the Media submenu.
- Open the Media Menu and select “Generate Thumbnail Cache”.

NOTE

- “Refreshing” an already existing thumbnail cache file can be done only from within the Pool.

- The thumbnail cache file is generated in the background so that you can continue working with Nuendo.

Playing Back Video

Video is played back together with all other audio and MIDI material, using the Transport controls.

IMPORTANT

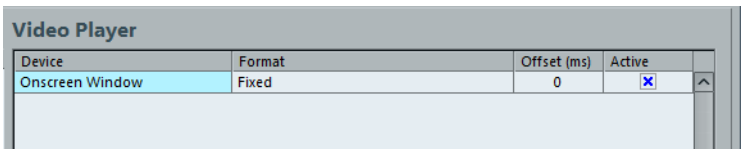
- For playing back video files, you must have QuickTime 7.1 or higher installed on your computer. There is a freeware version and a “pro” version, which offers additional video conversion options. The player engine is the same in both versions, so for mere playback in Nuendo there is no need to purchase the “pro” version.
- You need a video card that supports OpenGL (version 2.0 recommended) for proper video playback. A card with OpenGL 1.2 can also be used, but might put restrictions on the video functionality.

To check if your video equipment is capable of playing back a video from within Nuendo, open the Video Player page in the Device Setup dialog. If your system does not meet the minimum video requirements, a corresponding message will be displayed.

If you work with two video tracks in your project, the file on the lower track is played back. To watch a video file that is positioned on the upper video track, change the order of the tracks or mute the lower video track.

Device Setup

In the Device Setup dialog you determine which device is used for playing back video files.



The Video Player page in the Device Setup dialog

You can switch between different output devices during playback.

Setting Up a Video Output Device

PROCEDURE

1. Open the Devices Menu and select “Device Setup...” to open the Device Setup dialog, and select the Video Player page.
2. In the Active column, activate the checkbox for the device that you want to use for playing back video.

   All devices in your system that are capable of playing back video are listed. The Onscreen Window device serves for playing back the video file on your computer monitor.
3. From the pop-up menu in the Format column, select an output format.

   For the Onscreen Window output, only a “fixed” format is available. For the other output devices, you can select different output formats for playback depending on the device.
4. Adjust the Offset setting to compensate for processing delays.

   Due to delays while processing video, the video image may not match with the audio in Nuendo. By using the Offset parameter, you can compensate for this effect. The Offset value indicates how many milliseconds the video will be delivered earlier in order to compensate for the processing time of the video material. Each hardware setup can have different processing delays, so you must try out different values to determine which value is appropriate.

   NOTE

   - The Offset value can be set individually for each output device. It is saved globally for each output device and is independent of the project.
   - The offset is only used during playback. It is defeated in stop and scrub mode so that you always see the correct video frame.

AFTER COMPLETING THIS TASK

If the quality of the video image is not a critical factor or if you are experiencing performance problems, try lowering the value on the Video Quality pop-up menu. Although higher quality settings make the video display sharper and smoother, they also lead to an increased processor load.

RELATED LINKS

Video Output Devices on page 1102

Improving Video Performance

Sometimes, video problems, such as stutters during playback, are caused by codecs that do not support multi-threading. This can be the case for video files that use single-threaded decoding, such as Motion-JPEG, Photo-JPEG, and QuickTime DV codecs. These types of video files are typically created when capturing video with Decklink/AJA cards.

To compensate for this, you can activate the “Boost Video (Reduces Audio Performance)” option on the Video Player page in the Device Setup dialog. This excludes one of the available CPU cores from audio processing and reserves it for video tasks like decoding and playback. However, this may reduce the audio performance.

NOTE

For this option to have an effect, you must also activate the Multi Processing option in the Device Setup dialog (VST Audio System page).

Video Player

The Video Player window is used for playing back video on your computer screen.

- To open the Video Player window, open the Devices menu and select the “Video Player” option.

Setting the Window Size and Video Quality

To resize the Video Player window and/or change the playback quality of the video, select the appropriate option on the context menu of the Video Player window.

Fullscreen Mode

The window is enlarged to occupy the whole (computer) screen. If you are working with more than one monitor, you can move the Video Player window to an extra monitor. Thus, you can work with Nuendo on one monitor and let the video play back on another monitor. You can exit full screen mode via the window’s context menu or by pressing [Esc] on your computer keyboard.

Quarter Size

The window size is reduced to a quarter of the actual size.

Half Size

The window size is reduced to half the actual size.

Actual Size

The window size corresponds to the size of the video.

Double Size

The window is enlarged to twice the actual size.

Video Quality

This submenu allows you to change the quality of the video image.

NOTE

- To resize the Video Player window, you can also drag the borders.

- The higher the resolution, the more processing power is needed for playback. If you need to reduce the processor load, you can reduce the size of the Video Player window, or lower the value on the Video Quality submenu.

Setting the Aspect Ratio

Resizing the Video Player window by dragging its borders may lead to a distorted image. To prevent this, you can set an aspect ratio for video playback.

From the Aspect Ratio submenu of the Video Player context menu, select one of the following options:

None

The aspect ratio of the video is not kept when resizing the window. The image is enlarged/reduced to occupy the whole Video Player window.

Internal

The Video Player window can be resized at will, but the aspect ratio of the video is kept and black borders are displayed around the video image to fill the window.

External

The resizing of the Video Player window is limited according to the aspect ratio of the video image, i. e. the video image always fills the full window and its aspect ratio is kept.

NOTE

When the video is played back in full screen mode, the aspect ratio of the video is always kept.

Scrubbing Video

You can scrub video events, i.e. play them back forwards or backwards at any speed. This is done by clicking in the Video Player window and moving the mouse to the left or to the right. You can also use the Scrub controls on the Transport panel or a jog wheel on a remote controller for scrubbing video events.

RELATED LINKS

Project Scrubbing - The Jog Wheel on page 223
Playing Back with the Shuttle Speed Wheel on page 223

Editing Video

Video clips are played back by events just as audio clips are.

You can use all the basic editing operations on video events, just as with audio events. You can take a single event and copy it many times for the creation of mix variations. A video event may also be trimmed using the event handles to remove a countdown for instance. Furthermore, you can lock video events just like other events in the Project window, and you can edit video clips in the Pool.

It is not possible to fade or crossfade video events. Furthermore, you cannot use the Draw, Glue, and Mute tools with a video event.

NOTE

Windows only: If you find that you are unable to edit a video file copied from a CD, this might be due to the fact that files copied from CD are write-protected by default. To remove the write-protection, in the Windows Explorer, open the Properties dialog and deactivate the “Read-Only” option.

RELATED LINKS

Pool on page 572

About the Edit Mode

When you are editing audio material to a video, it is important to know how each audio edit relates to the exact frame of video where it occurs.

Video playback follows the Nuendo transport, i.e. the video frame at the current project cursor position is shown in the Video Player window. However, if you perform event or range-based editing tasks you will get no visual feedback. The special Edit Mode solves this problem, allowing you to edit audio while getting continuous visual feedback on the video display.

RELATED LINKS

Edit Mode on page 1159

Extracting Audio From a Video File

If a video file contains audio, the audio stream can be extracted.

As always when importing audio material, a dialog is displayed allowing you to select different import options. The extracted audio stream is added to the project on a new audio track and can be edited like all other audio material.

There are several ways to extract audio from a video file:

- By activating the “Extract Audio From Video” option in the Import Video dialog.

- By using the “Audio from Video File” option on the Import submenu of the File menu.

  This will insert an audio event starting at the project cursor position on the selected audio track. If no audio track is selected, a new one will be created.

- By activating the “Extract Audio on Import Video File” option in the Preferences dialog (Video page).

  This will automatically extract the audio stream from any video file during import.

- By using the “Extract Audio from Video File” option on the Media menu.

  This creates an audio clip in the Pool, but does not add any events to the Project window.

IMPORTANT

These functions are not available for MPEG-1 and MPEG-2 video files.

RELATED LINKS

Audio file import options on page 1187
Importing Video Files on page 1103
Audio editing to picture on page 1144

Replacing the Audio in a Video File

Once you have edited all audio and MIDI data to the video and created a final mix, you will need to put the new audio back with the video. You can do this by embedding the audio in another stream within the video container file.

PROCEDURE

1. Place the left locator at the start of the video file in Nuendo. This will ensure that your audio and video streams are synchronized.
2. Open the File menu and select the Audio Mixdown option from the Export submenu to export the audio file you wish to insert into the video container file.
3. From the File menu, select “Replace Audio in Video File…”.

   A file dialog opens prompting you to locate the video file.
4. Select the video file and click Open.

   Next, you are prompted to locate the corresponding audio file.
5. Select the audio file and click Open.

   The audio is added to the video file, replacing its current audio stream.

AFTER COMPLETING THIS TASK

Once the process is completed, open the video file in a native media player and check for proper synchronization.

RELATED LINKS
Audio editing to picture on page 1144
Export Audio Mixdown on page 1018

About Film Transfers

When working on film projects, video postproduction editors typically transfer the film footage to video for use with computer video editing systems.

Once the film has been edited, it can be transferred back to film for presentation in theaters or may remain in video format for television broadcast and release on videotape or DVD.

Pull-Up and Pull-Down

When film footage is transferred to video, the frame rate must be converted from 24 fps to either 25 fps (PAL/SECAM) or 29.97 fps (NTSC). This process introduces a slight speed change as a result of the mathematical relationships between the different frame rates.

When a specific speed change is applied to either audio or video, this is called a “pull-down” or “pull-up” depending on the direction of the change. The specific amount and direction depend on the type of transfer the film underwent. For example, transfers to PAL/SECAM and NTSC each require a different speed change in order to keep the audio in sync.

The film to NTSC conversion is done as a 2-3 pull-down and the film is running at 23.98 fps to maintain the exact 2:3 relationship. As a result the film is running ~0.1 % slower in NTSC TV.

These speed changes must also be applied to the audio recorded along with the film, in order for the audio to remain in sync with the picture. Sometimes the speed change is applied at the same time as the film transfer and is recorded directly on the videotape. This allows the video editor to hear the audio along with the transferred video while editing.

However, speed changes also result in pitch changes. Furthermore, this may lead to artifacts in the audio, due to the fact that a direct digital transfer from the field recorder to videotape is not possible without performing either a sample rate conversion or an analog transfer.

Therefore, most audio engineers prefer to use the original source material when working with film audio. Once the original audio has been digitally transferred into Nuendo, the speed change must be compensated for in order to keep the audio in sync with the video. Nuendo has the flexibility to apply these speed changes independently to either the audio or video.

RELATED LINKS
Compensating for Speed Changes on page 1117

The Telecine Process

A telecine machine is the device used to transfer film to videotape. It transfers images from each frame of film to frames of video in a very specific way.

Having a clear understanding of this process will help alleviate the confusion surrounding pull-up and pull-down sample rates and keeping film audio in sync.

Film Frames vs. Video Fields

One of the first things that need to be understood is how video signals are formatted in general. Each frame or single image of a video signal is composed of two video “fields”, each containing half of the image. The first field contains all the odd horizontal lines of resolution and the second field contains the even horizontal lines of the image. This is called “interlacing” and is needed to minimize the flicker effect that would result if the image was presented all at once.

Because the film frame is a single, complete image (like a 35 mm photograph), there are no fields involved. The telecine machine must transfer part of the film image to one field and then the rest to another field of video. This may sound simple at first but as you will see, it can become quite complex.

Transferring Film to PAL/SECAM Video

Film transfers to PAL/SECAM video are relatively straightforward. Film runs at 24 fps and PAL video runs at 25 fps. If you speed up film by roughly 4% (or 4.16%, to be precise), it will be running at 25 fps. So, film transfers to PAL video result in a 4% “pull-up” in speed. The audio must also be pulled up by 4% in order to remain in sync with the video.

When properly done, the first frame of film will be transferred to both fields of the first frame of video and so on. All that is needed is the 4% increase in speed for this to be a one-to-one transfer.

IMPORTANT

The only downside to PAL transfers is that a 4% increase in the speed will result in a 4% increase in the pitch as well! This could affect the perception of a character’s delivery of a line or the timbre of sound effects or musical tonalities. If the final project is to remain in the video format, pitch-correcting this anomaly might be necessary.

If the project is going to be returned to film for the final presentation, the audio can be slowed back down to normal speed when transferring back to film in order to preserve the fidelity and performance values of the original material.

Transferring Film to NTSC Video

Transferring film at 24 fps to NTSC video at 29.97 fps presents a few more difficulties than the PAL transfer. Simply speeding up film to 29.97 fps would cause both the visual and audio elements to become too fast and high-pitched to be usable. There is no neat mathematical relationship between 24 fps and 29.97 fps. Another method was devised called the 2-3 pull-down.

What is 2-3 Pull-Down?

The 2-3 pull-down is a combination of speed change and frame-to-field-counting that results in a smooth transfer to NTSC video without any unwanted or noticeable pitch changes in the audio. Here are the steps involved during the process:

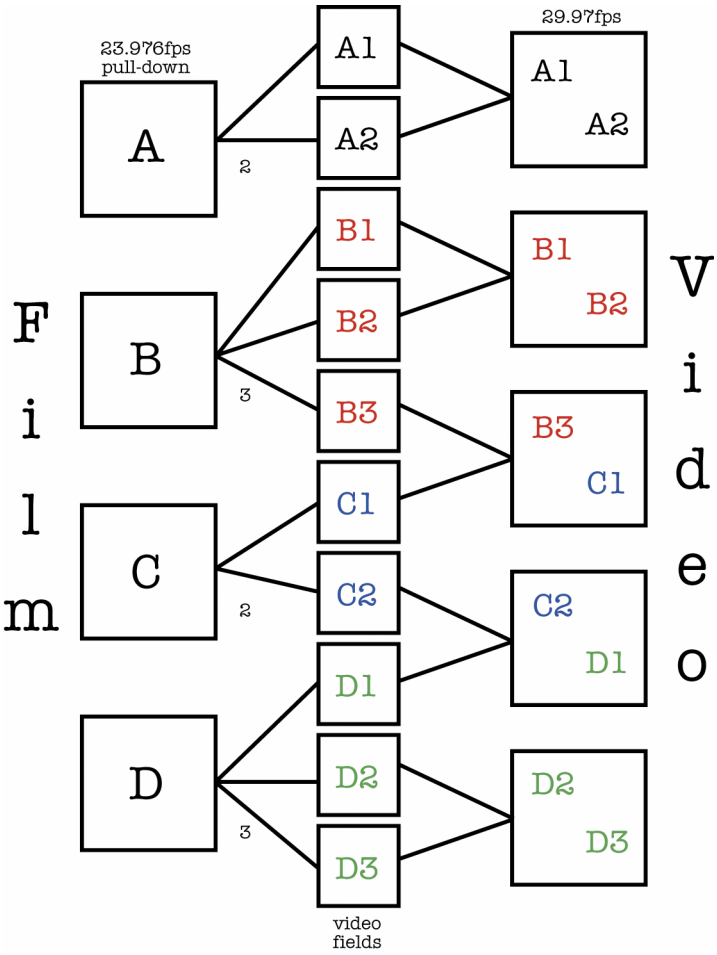
1) The film speed is slowed or “pulled” down to 23.976 fps (-0.1 %).

   At this speed there is a mathematical relationship between 23.976 and 29.97.

2) The first frame of film is transferred to the first two fields of video.
3) The second frame of film is transferred to three fields of video, the two fields of the second video frame and just the first field of the third video frame.

   This is where the “2-3” part of the name comes from. Each alternating frame of film is transferred to two fields of video, then three fields of video, and so on.

4) The third film frame is transferred to the second field of video frame three and the first field of video frame four.



This is a block diagram of the 2-3 pull-down process. Notice that 4 frames of film are transferred to 5 frames of video using the 2-3 field technique.

5) The remaining film frames are transferred in this manner, alternating between 2 and 3 fields of video, until the end of the transfer.

   After four frames of film have been transferred this way, an even five video frames will be created. Over the course of one second, 24 frames of film and 30 frames of video will have gone by. Because they are running at -0.1 %, the actual frame rate is 29.97 video frames per second, the NTSC standard.

It is important to have a clear understanding of 2-3 pull-down in order to make accurate decisions regarding audio pull-down and video pull-up when working with NTSC film transfers in Nuendo.

Film speed is faster than NTSC video speed. When the audio is pulled down, it allows production audio (DAT tapes or files from a field recorder) from a film shoot to play back in sync with NTSC video. Even though 29.97 fps is a faster frame rate than 24 fps (film speed), the video is running -0.1 % slower than the original film due to the 2-3 transfer process and hence the need to slow the audio down a bit.

IMPORTANT

Many video editors working with NTSC video refer to 30 fps as “film speed” as opposed to 24 fps. The reason for this is, if you speed NTSC video (29.97 fps) up by 0.1 %, you are running at the same speed as the original film at 24 fps. Conversations regarding this can often get very confusing. Make sure that you have a clear understanding of the material you are working with when dealing with film transfers and frame rates. It will avoid many mistakes and save time in the long run.

Compensating for Speed Changes

In Nuendo, there are two basic ways to compensate for speed changes due to film transfers.

The first is by adjusting the playback speed of the audio to match the speed of the video. The second is to adjust the speed of the video file to match the original speed of the film and production audio in Nuendo.

Adjusting Audio Playback Speed

When adjusting audio playback speed to match the video, there are two scenarios based on the two video formats that film is transferred to, NTSC and PAL/SECAM.

Because the telecine process for each video format results in different speed changes, there are two types of playback adjustments possible. For NTSC, the speed change is down -0.1 %. For PAL/SECAM, the change is up +4.1667 %.

Audio Pull-Down -0.1 % (NTSC)

When working on a film project that has been transferred to NTSC video, most audio engineers prefer to use the original source tapes from the film shoot in order to retain the highest quality and fidelity. Audio that has been transferred to the videotape during the film transfer has suffered a generation loss and speed change.

Because the video is running -0.1 % slower than the original film, the audio must also be slowed down by the same amount as the film in order to remain in sync.

In most cases, to slow down audio playback in Nuendo, an external sample clock source will be needed to “pull” the clock speed down by 0.1 %.

For this to work, your audio card must be set to external sync and connected to the clock device via word clock, VST System Link, or some other clocking method. Furthermore, you have to “tell” Nuendo that it is being synchronized with an external clock source. This is done in the Device Setup dialog.

Because video and audio playback speeds are independent in Nuendo, the video will remain at the same speed while the audio is slowed down (pulled down). This ensures that the production audio and film transfer remain in sync.

Either you receive an OMF, AES 31, or OpenTL file that contains audio from the original source tapes conformed to the edited video or you have to record the source tapes into Nuendo yourself. In both cases, you have audio in Nuendo that is edited to the picture but will not stay in sync with the video unless you pull down the sample rate.

IMPORTANT

- When Nuendo is running at a non-standard sample rate (47.952 kHz = 48 kHz pull-down), digital transfers into Nuendo from external equipment must be made with the external equipment locked to the same sample clock as your audio card. Most devices are capable of a 0.1 % change in sample rate and will function normally.
- Any audio mixdowns that are exported from Nuendo when the sample clock is pulled down, will play back in other applications and devices faster because that sample clock will be running at the standard 48 kHz.

The idea is that when you have completed the audio mix for your film project, the video will be sped back up to film speed for the final transfer back to film and your audio mix can then be played at the standard 48 kHz sample rate (no pull-down) and will remain in sync with the picture.

Using this method preserves the quality of the original audio recording made during filming and allows for a digital mixdown transfer at film speed without any generation loss or sample rate conversion.

RELATED LINKS

Selecting a Driver on page 14

Audio Pull-Up +4.1667 % (PAL/SECAM)

Audio pull-up (+4.1667 %) is the same concept applied to PAL/SECAM video transfers.

Because the film is sped up by 4.1667 % during transfer, audio in Nuendo must be running at +4.1667 % speed in order to remain in sync with the video during editing and mixing.

In this case, the external clock must be set to +4 % varispeed.

IMPORTANT

Steinberg's SyncStation is capable of varispeed and has presets for the 4.1667 % necessary with PAL film transfers and the -0.1 % for NTSC.

Once the project is complete, Nuendo sample rate can be returned to normal (48 kHz) for the final mixdown at film speed. Once again, this allows for a digital transfer of the final master at the correct speed for theatrical presentation.

Non-Standard Audio Pulls

It is also possible to use pulled sample rates that do not fit one of the above scenarios.

These sample rates would only need to be used in exceptional circumstances when an error has occurred elsewhere in the process of making a film. These settings can be used to correct for sync errors made at another studio or problems with video editing systems. Just about anything is possible.

- -4% pull-down

  If a film project was transferred to PAL/SECAM video and the audio editing and mixing was performed at video speed (48kHz) without using audio pull-up, the final mix would be running at video speed not film speed. In this case a -4% pull-down can be used to correct this and get the audio running at film speed again. The downside to this is that the final transfer to film would either have to be analog or through a sample rate converter in order to be recorded with the film.

- +0.1% pull-up

  This pull-up is not normally used except in situations similar to the one described above but for NTSC video. It can be used to correct the speed of a project finished at video speed (without pull-down) prior to transferring it to film. Because film is moving 0.1% faster than NTSC video, the audio mix can be sped up to film speed using +0.1% pull-up for the transfer.

- Other pull-up/pull-down options

  There may be other scenarios where non-standard pull-ups and pull-downs can be used to correct mistakes. Nuendo provides further pull-up/pull-down options for such situations in the Project Setup dialog and the respective section in the Project Synchronization Setup dialog.

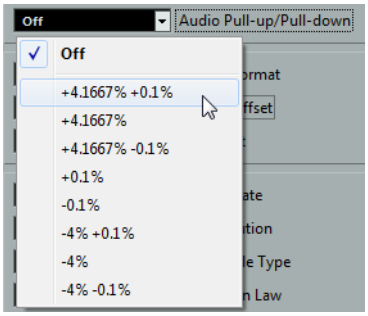
IMPORTANT

All the examples used here are with 48kHz as the standard sample rate for the film and video industry. However, it is possible to accomplish the same tasks using 44.1kHz, 88.2kHz, 96kHz (this is double the standard sample rate and commonly used for higher fidelity), 176.4kHz and 192kHz, provided you have an external clock device capable of pulling these higher sample rates.

Adjustments When Applying Audio Speed Changes

When the audio clock of your audio card is being slowed down or sped up from an external clock source, Nuendo cannot know that it is running slower or faster than normal. The time displays (minutes:seconds, timecode) will become inaccurate because they are based on a sample count, not the independent clock source.

Nuendo provides an adjustment of the timeline to compensate for these changes. This setting is found in the Project Setup dialog as well as in the Project Synchronization Setup dialog in the “Project Setup - Time” section.



NOTE

It makes no difference whether you make your Audio Pull-up/Pull-down settings in the Project Setup dialog or the Project Synchronization Setup dialog. If you use the Project Synchronization Setup dialog, your adjustment is reflected in the Project Setup dialog, and vice versa.

Whenever you apply an audio pull to Nuendo from an external clock, also set “Audio Pull-up/Pull-down” to the corresponding setting. This allows Nuendo to recalculate the sample count to reflect the adjusted sample rate.

For example, if the setting is switched from no pull-down to -0.1 % pull-down, events on the timeline will appear longer because the sample rate has been slowed down. The event display will show the accurate length of events relative to timecode, minutes, and seconds.

NOTE

In the Project window, the status line below the toolbar also indicates whether Audio pull-up or pull-down is applied to this project.

When you change the setting for Audio Pull-up/Pull-down and there are audio events in the timeline already, Nuendo prompts you to choose whether or not to keep the original sample start times.

- Select No to let the events follow the timecode and minutes:seconds clock change and remain at their SMPTE start times.
- Select Yes to force Nuendo to leave events at the same sample start time regardless of the clock speed change.

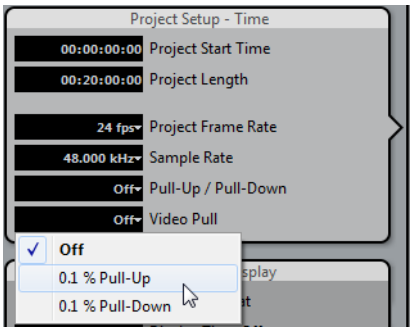
Video Pull-Up and Pull-Down

Nuendo also provides a method to adjust for film transfers by speeding up or slowing down playback of the video files in your project.

Depending on the situation, it can be helpful to make the video file play back at film speed and not adjust the audio playback at all.

Adjusting the video playback speed back to film reverses the process used when adjusting audio playback speed. For NTSC video, the video playback speed must be adjusted up +0.1 % back to film speed.

Altering the video playback speed is done in the Project Synchronization Setup dialog ("Project Setup - Time" section). You have two options: 0.1 % pull-up and 0.1 % pull-down.



Video +0.1 % Pull-Up for NTSC

Because NTSC video is running -0.1 % slower than the original film, pulling the video speed back up by +0.1 %, returns it to original film speed. With the video now running at the correct film speed, audio originally recorded at 48 kHz on the film shoot will remain in sync with the video. Additionally, the final mix can be digitally transferred back to film at 48 kHz without the need for an analog copy or sample rate conversion.

Video -0.1 % Pull-Down (Non-Standard)

Pulling the video speed down for an NTSC video is a non-standard procedure and would not happen under normal circumstances. It is possible to pull down a video file that is running at 24 fps -0.1 % so it matches with material running at NTSC video speed. The resulting frame rate is 23.976 fps.

NOTE

Speeding up or slowing down the video speed is only possible if the video is running through a "computer video card". If a professional genlocked video card is used, the video playback speed is derived from the genlock input.

What is 23.976 fps Used for?

The world of digital video formats is ever changing and the results are new developments for every media professional involved in movies, television, corporate video, and more. With the advent of HD cameras that are capable of recording at several different frame rates internally, the options available to cinematographers have become staggering.

Because the look of film running at 24 fps is unique, many HD productions are filmed at 24 fps to mimic the look of film on video. Because the speed change from 24 fps to 29.97 fps NTSC is such an odd one (requiring the 0.1 % pull-down), designers of these cameras have developed a method of recording that allows the camera to record like film but also output a NTSC video signal at the same time without any speed change. They record at 23.976 fps which translates to 24 fps pulled down -0.1 %.

Working with Video Tape Recorders

Whenever you are interfacing Nuendo with external hardware, some additional computer hardware may be necessary.

In the case of using video tape recorders (VTRs) with Nuendo, a device capable of dealing with SMPTE timecode, word clock, video reference clock, MIDI machine control, and Sony 9-Pin machine control protocols will be needed.

The most important aspect of working with VTRs is the ability to maintain the best possible synchronization between Nuendo and the tape machine. Using a device such as Steinberg's SyncStation will provide the best results.

Regardless of your hardware setup, Nuendo will have to be configured to synchronize with the VTR.

RELATED LINKS

Synchronization on page 1061

Tips

There are so many variables within the boundaries of a multi-media project that only years of experience can cope with all of them. However, here are a few tips and good ideas you can use to help eliminate some common issues.

Preproduction Planning

The most important tip for making postproduction go smoothly for a TV commercial, feature film or even internet media creation is good use of preproduction planning. Try and meet with all the people involved in a project prior to starting in order to decide how the work will flow once you get into postproduction. Determining frame rates for film and video, film transfer issues, what format the location audio will be recorded in, delivery formats and other details including a working copy of the script will be invaluable to any postproduction audio professional.

TC Burn-In

The timecode burn-in window (BITC) is a section of the video image that contains timecode numbers for each frame of video from the original video editor. Using this, it is possible to align a video perfectly in Nuendo so that all the timecode numbers line up exactly.

Timecode burn-in window in a video image

ReConform

The ReConform function allows you to automatically adapt edited audio projects to new cut versions of video material.

Post production often includes working on audio mixes with early cut versions of video material. When changed versions of the video material are delivered, you must manually identify the changed parts and adapt the audio mix accordingly. This can be very time-consuming.

The ReConform function re-adapts the audio mix to the changed video material. While most of this is done automatically, you can still make manual changes.

Help functions, such as markers and previews support your preliminary and subsequent work processes.

Prerequisites

The ReConform function requires the following:

- A Nuendo project.
- Edit Decision Lists (EDLs) for the current cut version and the target cut version of the video material. In the **ReConform** dialog, these are called **Old** and **New** EDL.

  Instead of old and new EDLs you can also use a single EDL that contains the changes from old to new EDL. This EDL is called **Change EDL**. This file can also be generated in the **ReConform** dialog.
- Optional for video preview: video files that represent the current and target cuts of the video material.

RELATED LINKS

EDLs on page 1148

ReConform Workflow

The ReConform function automates most of the typical workflow that includes comparing old and new EDLs as well as applying the EDL changes correctly to the Nuendo project.

The ReConform workflow includes the following steps:

1) You import and compare different versions of EDLs. This creates a new EDL that contains the differences between your current project and how it is supposed to be to match the new video. This EDL is called **Change EDL**.

NOTE

If available, you can directly import a **Change EDL**.

2) You manually check and validate the entries in the **Change EDL** and make corrections where necessary.

   You can use the preview functions to see the result of the ReConform process for single entries in the **ReConform** dialog and in the **Project** window. The preview does not affect the original audio or video material.

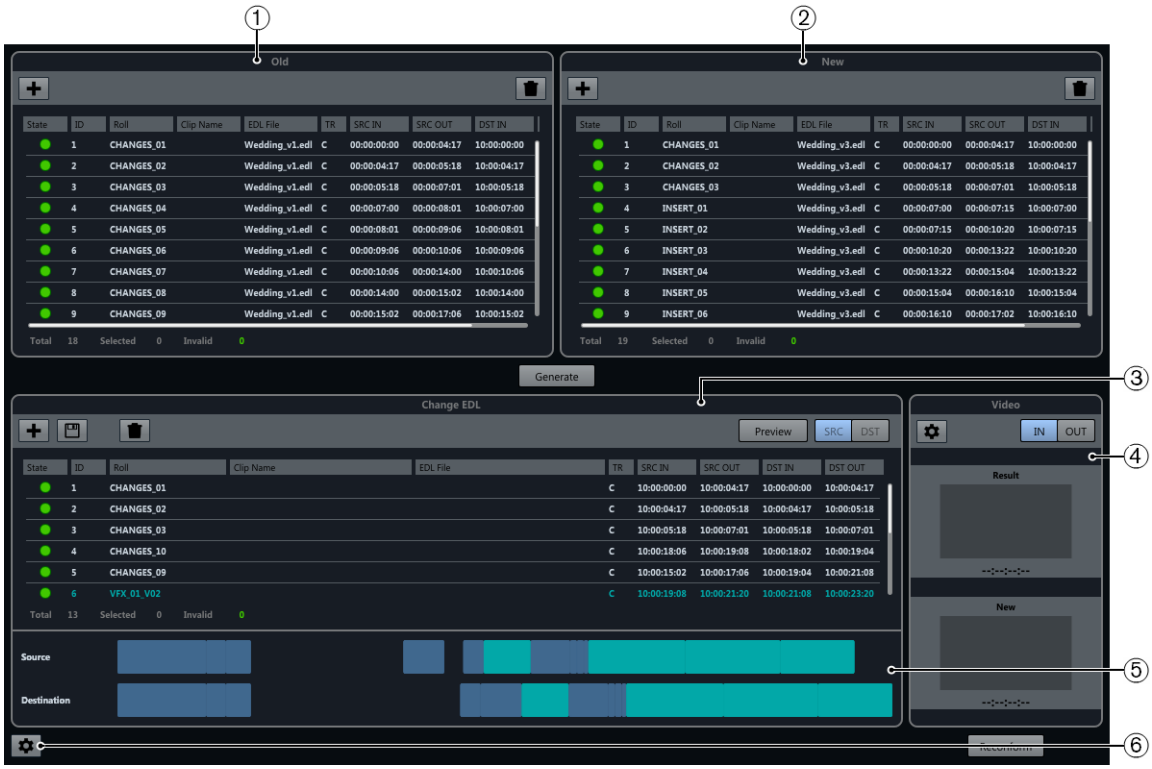
3) When you have made all changes to the **Change EDL**, you start the ReConform process which applies the changes to the project.

ReConform Dialog

The **ReConform** dialog contains the main user interface for the ReConform function.

NAVIGATION PATH

Project > ReConform



1) **Old** EDL that represents the current cut version of the video material.
2) **New** EDL that contains an updated version of the video material.
3) **Change EDL** that displays the changes between old and new EDLs and that includes a preview function.
4) Video preview that displays video frames of selected entries in the **Change EDL**.
5) Timeline that displays the entries of the old and the new EDL that are used to create the **Change EDL**.
6) **Open ReConform Settings** button that allows you to configure the ReConform function.

RELATED LINKS

ReConform Settings on page 1134

EDLs

Edit Decision Lists (EDLs) form the basis of the ReConform function.

The main idea of the ReConform function is to adapt changes in EDLs to a current audio mix. As a prerequisite, you must have at least an existing EDL and a new EDL. Alternatively, you can use an EDL that already contains changes, the **Change EDL**.

The **ReConform** dialog allows you to import old and new EDLs that you can use to generate a **Change EDL**. You can also import an existing **Change EDL**.

In the dialog, you can find these EDLs in the **Old**, **New**, and **Change EDL** lists. In these lists, you have the following options:

Add EDL

Allows you to add an existing EDL into the **ReConform** dialog.

Save EDL (Change EDL only)

Saves a generated **Change EDL**.

Delete EDL

Deletes all entries in the corresponding list.

Each EDL consists of the following data:

State

State of the entry. Green indicates that the entry is valid. Red indicates that the entry is invalid. If you move the mouse pointer over the symbol in the column, a tooltip provides an error description.

ID

ID of the entry.

Roll

Roll name of the entry.

Clip Name

Clip name of the entry.

EDL File

The name of the EDL file from which this entry was read.

TR

Transition type of the entry.

- C - Cut
- D - Dissolve
- W - Wipe

SRC IN

Start timecode of the entry in the original video file or clip.

SRC OUT

End timecode of the entry in the original video file or clip.

DST IN

Start timecode of the entry in the project.

DST OUT

End timecode of the entry in the project.

In addition to the columns, all EDLs inform you about the number of entries and how many of them are selected or invalid.

RELATED LINKS

Adding EDLs on page 1129

Change EDLs

The **Change EDL** displays the changes between old and new EDLs.

It can either be generated through comparison of old and new EDLs or imported directly into the **ReConform** dialog.

Each entry in the **Change EDL** specifies which parts of the current project version, indicated by the timecodes in the **SRC IN** and **SRC OUT** columns, are to be put at a different position in the new project version, indicated by the timecodes in the **DST IN** and **DST OUT** columns.

If you select an entry in the **Change EDL**, the corresponding entries in the old and new EDLs are displayed in a different color.

Timelines

Below the **Change EDL**, the entries of the old and new EDLs that were used for creating the **Change EDL** are displayed on timelines. The **Source** timeline displays the old EDL, the **Destination** timeline the new EDL.

Entries that are selected in the **Change EDL** are highlighted in the same color on the timelines. VFX shots that were found while the **Change EDL** was being created have a specific color in the list and on the timelines.

Preview

The **Preview** function of the **Change EDL** section allows you to check how one or several selected entries will affect the result of the ReConform process. Any manual healing or extending of entries as well as the editing of timecodes in the **Change EDL** can be previewed before the start of the actual process. You can listen to the result and inspect the audio and video material of the source version and the destination version in detail. You can also add notes to the destination preview. It is not possible to make changes to the destination version.

In the **Project** window, locators mark the time range that is used during the ReConform process. Technically, the preview result is added to the project with a one day time offset, which will be deleted after the preview is deactivated. The resulting tracks are locked for as long as the preview is active. This prevents you from making changes to the resulting material, as the changes will be lost as soon as the preview is deactivated.

Preview

If this button is activated, the preview shows the source or the destination version of the selected entry in the **Project** window. The button blinks if the preview is active.

SRC

If this button is activated, the preview shows the source version of the selected entries in the project.

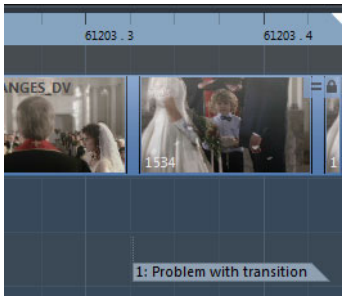
DST

If this button is activated, the preview shows the destination version of the selected entries in the project.

Adding Notes to the Preview

In the preview, you can create markers to add notes within the destination time range.

For example, if you discover problems within the generated data of the preview, you can add notes to the **Memos** marker track that is automatically created when you activate the preview. The notes are transferred to the corresponding entry in the source version.



PROCEDURE

1. Activate the **DST** button to display the destination version of the selected entry.
2. On the **Memos** marker track, add a marker and move it to the required position.
3. Enter a description for the marker.

RELATED LINKS

Marker Track on page 322

Adding EDLs

You can add standard EDLs to the **Old** and **New** lists in the **ReConform** dialog. You can import an existing **Change EDL** to the **Change EDL** section.

PREREQUISITE

You have received EDL files in one of the following formats:

- CMX3600
- FILE16
- FILE32

PROCEDURE

1. In any of the lists, click **Add EDL** ✚.
   The **Add EDL to <name of list> List** dialog opens.
2. Click **Browse EDL Files** 🗀.
3. Select one or more EDL files and click **Open**.

4. Optional: In the **Add EDL to <name of list> List** dialog, specify a timecode offset for the destination times in the **DST Offset** field. In the **Add EDL to Change EDL List** dialog, you can also specify a timecode offset for the source times in the **SRC Offset** field.
5. Click **OK**.

RESULT

The EDL is displayed in the **ReConform** dialog. The timecode offsets are added.

Deleting EDLs

You can delete added EDLs from the **ReConform** dialog.

PROCEDURE

- In the EDL, click **Delete** .

RESULT

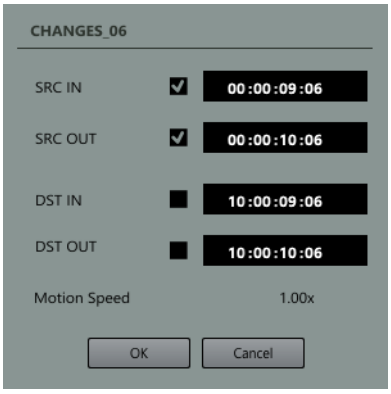
The EDL is deleted from the dialog.

Modifying Timecodes

You can modify the source and destination start and end times for a selected entry in an EDL.

PROCEDURE

1. Select an entry in **Old** EDL, **New** EDL, or **Changed EDL**.
2. Right-click the entry.
   The context menu opens.
3. Select **Edit**.



4. In the dialog, change the timecodes of the source and destination time ranges. You have the following options:
   - Activate either **SRC IN** and **SRC OUT** or **DST IN** and **DST OUT** and change only one of the timecodes. The other timecode is automatically adjusted. The range length remains the same.
   - Activate either **SRC IN** and **DST IN** or **SRC OUT** and **DST OUT** and change only one of the timecodes. The other timecode is automatically adjusted. The range length in the SRC and DST areas are equally modified.
   - If you want to change the beginning or end of the time range, you can change one of the timecodes.

   NOTE

   The **Motion Speed** indicator that is available if you modify timecodes in the old and new EDLs informs you about differing source and destination range lengths. If it displays “2.00x”, the source range is twice the length of the destination range. This indicates that the source material is referenced with double playback speed.

EXAMPLE

You have received an EDL, but the EDL does not match with the video. This can occur if a video sequence is changed after the EDL was created.

If the video sequence was moved, you can, for example, activate the **SRC IN** and **SRC OUT** timecodes and change these accordingly.

Deleting EDL Entries

You can delete EDL entries from the added or generated EDLs.

PROCEDURE

1. Select one or multiple entries in the EDL.
2. Right-click the entries.
3. Select **Delete**.

RESULT

The entries are deleted from the EDL.

Generating Change EDLs

You can generate a **Change EDL** from an old and a new EDL.

PREREQUISITE

You have added an old and a new EDL file to the **ReConform** dialog.

PROCEDURE

- Click **Generate**.

RESULT

The **Change EDL** is added to the **ReConform** dialog. It displays the changes between the old and new EDL files.

Saving Change EDLs

You can save a **Change EDL** that you generated with the ReConform function.

PROCEDURE

1. Click **Save Change EDL** .
2. Enter the name of the file.
3. Click **Save**.

Healing Entries in the Change EDL

Healing entries helps reducing the complexity of a **Change EDL** by combining two or more consecutive entries to become one entry.

Healing is useful if the comparison of old and new EDL results in a **Change EDL** in which multiple consecutive entries are unchanged and still in the same order.

PROCEDURE

1. Select two or more consecutive entries in the **Change EDL**.
2. Right-click within the selected entries.
3. Select **Healing** and choose from the following options:
   - **None**
     Entries are not combined.
   - **Normal**
     Consecutive entries without gaps are combined to a single entry.

- **Gaps without Inserts**

  Consecutive entries with gaps are combined to a single entry if the gap length is identical in source and destination file and there is no **New** EDL entry that inserts a new video clip into this gap.

- **Gaps with Inserts**

  Even if a **New** EDL entry inserts a new video clip into a gap, consecutive entries with gaps are combined to a single entry if the gap length is identical in source and destination file.

NOTE

You can automate the healing process by selecting one of the **Heal Processing** options in the options dialog. You can always return to uncombined entries by selecting **None**.

RESULT

The selected consecutive entries become one entry.

RELATED LINKS

ReConform Settings on page 1134

Extending Entries in the Change EDL

Extending entries helps closing gaps that are caused by new inserts.

Some inserts from new EDLs can replace existing events in the previous EDLs. This deletes already existing audio for the previous events and creates gaps. You can extend events before or after a gap to use their audio within the gap.

PROCEDURE

1. Right-click an entry in the **Change EDL**.
2. Select **Extend Event** and choose one of the following options:
   - **Until Previous Event**

     Extends the entry to the previous event.
   - **Until Next Event**

     Extends the entry to the following event.
   - **Until Previous and Next Event**

     Extends the entry to the previous and the following event.

RESULT

The source and destination ranges of the entry are extended.

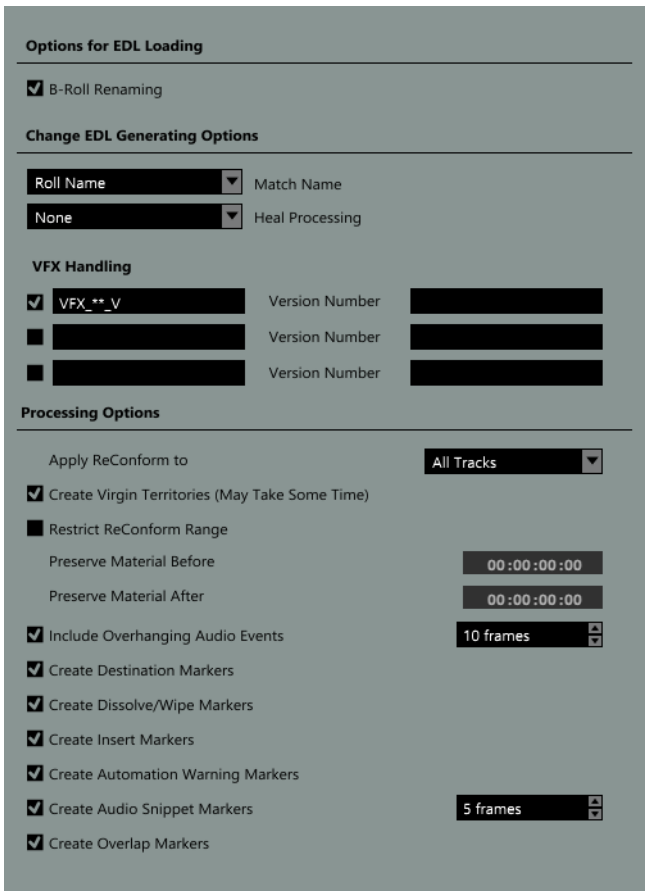
EXAMPLE

If you have a series of film scenes and in one shot, the director chose to use the picture of camera 2 instead of camera 1, this picture change is detected by the ReConform function. In the **Change EDL**, the original audio for the new picture shot is discarded and replaced by an empty area. If you want to keep the audio that was used right before the shot, you can extend the length of an existing **Change EDL** entry to a neighboring gap.

ReConform Settings

ReConform provides settings that allow you to configure the ReConform function and to automate several functions.

To open the **ReConform Settings** pane, at the bottom of the **ReConform** dialog, click **Open ReConform Settings** .



Options for EDL Loading

B-Roll Renaming

If this option is activated, the roll names of all entries in a loaded EDL are searched for a trailing “B”. If a trailing “B” is found in any of the entry names and if the EDL contains an entry with the same name that has no trailing “B”, the B is deleted from the roll name.

Change EDL Generating Options

Match Name

Allows you to decide if the roll name or the clip name of an event is used for creating the **Change EDL**. Use the clip name if the roll name is not unique due to the data format, for example.

Heal Processing

Allows you to combine specific entries in the **Change EDL** to reduce complexity.

- **None**
  Entries are not combined.
- **Normal**
  Consecutive entries without gaps are combined to a single entry.
- **Gaps without Inserts**
  Consecutive entries with gaps are combined to a single entry if the gap length is identical in source and destination file and there is no **New** EDL entry that inserts a new video clip into this gap.
- **Gaps with Inserts**
  Even if a **New** EDL entry inserts a new video clip into a gap, consecutive entries with gaps are combined to a single entry if the gap length is identical in source and destination file.

VFX Handling

Allows you to specify and activate up to 3 naming patterns for recognizing VFX (visual effects) shots in the loaded EDL. VFX shots are film sequences with a multitude of different versions that are denoted in the clip or roll name of a corresponding EDL entry according to a custom naming scheme. As VFX shot changes usually have no impact on the audio, naming patterns ensure that simple version changes are not treated as inserts.

Each pattern definition must contain a version number that may be extended by a prefix and a suffix, for example, “VFX_01_V03.mpg”, where “VFX_01_V” is the prefix, “03” the version number, and “.mpg” the suffix.

If naming patterns are activated, **Old**, **New**, and **Change EDL** show the recognized VFX shots in a different color.

Processing Options

You can use the following options to specify what the ReConform function must take into account. For every marker setting, a marker track is created in the **Project** window.

Apply ReConform to

Allows you to process all tracks or selected tracks.

Create Virgin Territories

If this option is activated, the ReConform function automatically creates automation gaps where required, for example, where new scenes have been inserted.

Restrict ReConform Range

If this option is activated, the project data before and after the specified timecodes is not changed during the ReConform process.

- **Preserve Material Before**
  Enter the timecode before which the project data may not be changed.
- **Preserve Material After**
  Enter the timecode after which the project data may not be changed.

Include Overhanging Audio Events

If this option is activated, overhanging sections of audio events are taken into account when video clips are moved. You can specify the maximum frame length for these overhangs.

Create Destination Markers

If this option is activated, cycle markers are created that display the position of each **Change EDL** entry after the ReConform function is applied.

Create Dissolve/Wipe Markers

If this option is activated, dissolve or wipe markers are created at positions where dissolve or wipe transitions in the source EDLs are converted into cuts in the **Change EDL** file.

Create Insert Markers

If this option is activated, cycle markers are created at positions where the new EDL inserts new video clips.

Create Automation Warning Markers

If this option is activated, markers are created at positions where automation is affected, for example, when a jump occurs. The name of the marker contains the name of the affected audio track.

Create Audio Snippet Markers

If this option is activated, audio snippet markers are created for small sections of audio events that are cut off from the events. For the ReConform function to detect a snippet, you can specify the maximum threshold in frames.

Create Overlap Markers

If this option is activated, overlap markers are created for audio events that overlap each other after the ReConform process.

RELATED LINKS

Restricting the ReConform Range on page 1137
Including/Excluding Overhanging Audio Events on page 1137
Examples for Markers on page 1139
Markers on page 312
Virgin Territory vs. Initial Value on page 666

Restricting the ReConform Range

You can exempt project material from the ReConform process.

Usually, the ReConform function is applied to an entire Nuendo project. In this case, the used EDLs lead to a restructuring of all material that is available. However, if the project contains more than one episode, you may want the new EDL to restructure only the episode that contains changes instead of the entire project. To avoid that the rest of the project data is changed or overwritten, use the **Restrict ReConform Range** option in the **ReConform Settings** pane.

PROCEDURE

1. In the **ReConform Settings** pane, activate **Restrict ReConform Range**.
2. Enter the range that you want to preserve.
   - In the **Preserve Material Before** field, enter the timecode before which the project data may not be changed.
   - In the **Preserve Material After** field, enter the timecode after which the project data may not be changed.

RELATED LINKS

ReConform Settings on page 1134

Including/Excluding Overhanging Audio Events

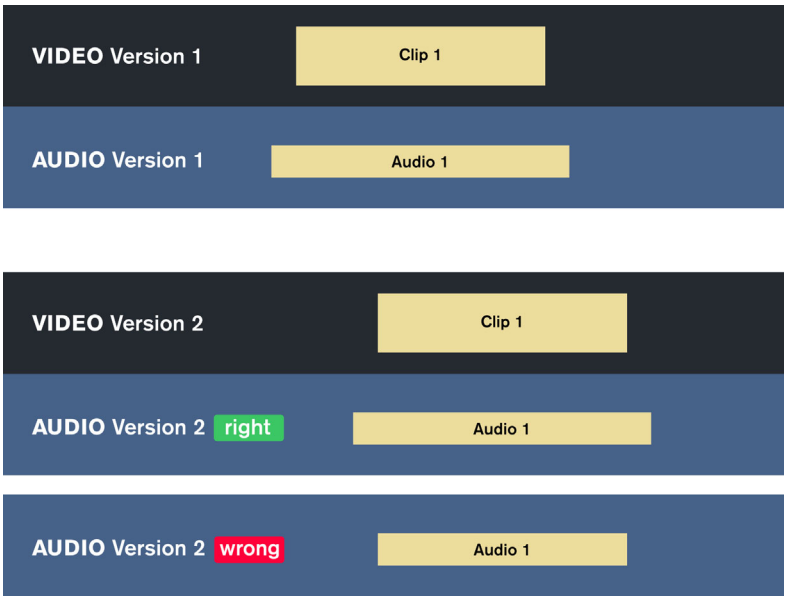
You can prevent overhanging audio events from being cut if a video clip does not have the same length as the audio event.

If a video clip is shorter than the corresponding audio event, the ReConform process may cut off the sections of the audio event that hang over. To avoid these cuts, you can activate the **Include Overhanging Audio Events** option in the **Processing Options**. If you move video clips to another position, the overhanging sections of the audio events are moved together with the video clip.

You can specify the maximum number of overhanging frames.

EXAMPLE

In the illustration, video clip 1 is shorter than audio event 1. If you activate the **Include Overhanging Audio Events** option and move the video clip to another position, the audio event moves with the video clip. Its length remains unchanged. If the option is deactivated, the overhanging sections in audio event 1 are cut off.



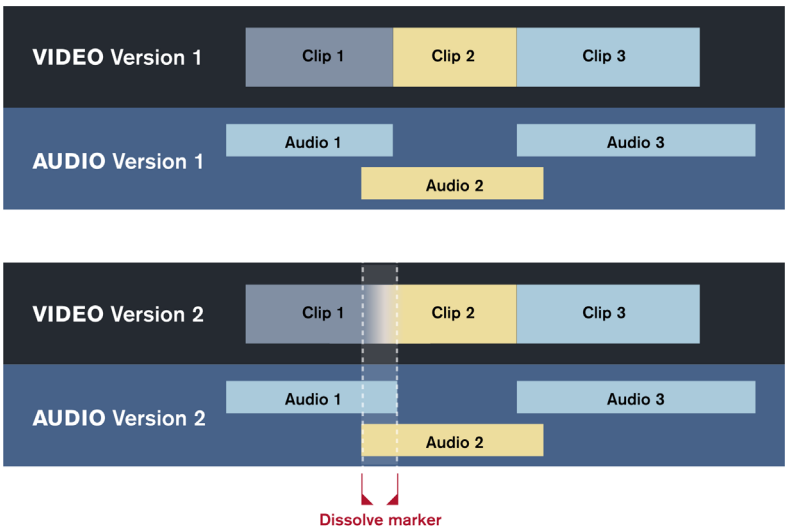
RELATED LINKS

ReConform Settings on page 1134

Examples for Markers

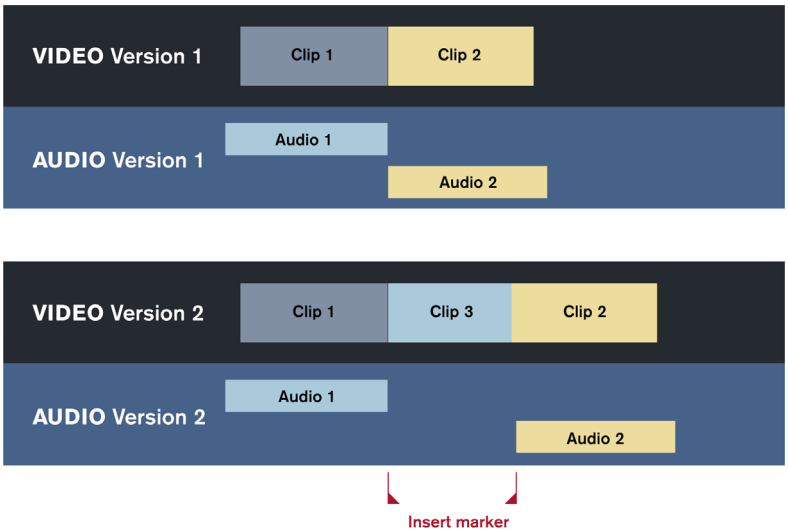
The following examples provide an overview of the markers that can be created by the ReConform process.

Dissolve/Wipe Markers



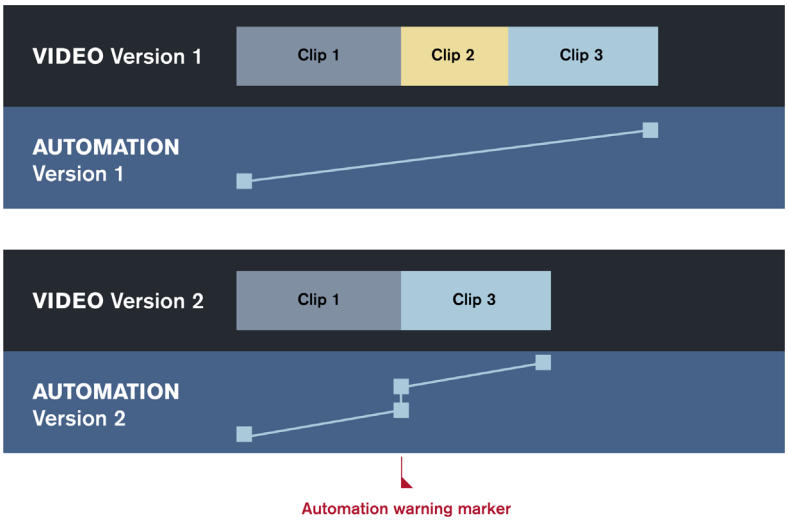
A dissolve or wipe marker is created if either the old or the new EDL contains a dissolve or wipe transition between 2 video clips. In the illustration, such a transition is detected in video version 2 where a marker is added. In the **Change EDL**, this transition is converted into a cut. The **Dissolve/Wipe** marker track displays the position of the cut.

Insert Markers



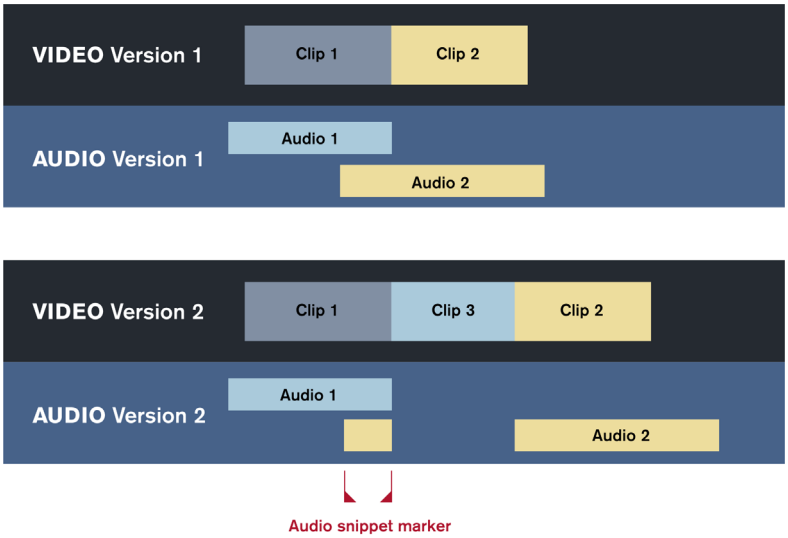
An insert marker is created if the new EDL inserts a new video clip. The ReConform process inserts a cycle marker at the position of the new video clip. In the illustration, clip 3 is the new video clip. The **Insert** marker track displays the position of the new video clip.

Automation Warning Markers



Automation warning markers are created if changes in the video cut lead to strong differences in automation curves, such as jumps. In the illustration, the automation curve in version 1 increases gradually from clip 1 to clip 3. In version 2, clip 2 has been deleted, which breaks the automation curve and lets it continue at a different level. The ReConform process detects this and creates an automation warning marker at this position. The **Automation Warning** marker track displays the position of the automation issue.

Audio Snippet Markers



Audio snippet markers are created if the ReConform process divides existing audio events due to insertions in the recut video. If one of the cut pieces is a small snippet, it is marked with an audio snippet marker. To define the length of the snippets, you can set the number of frames using the **Create Audio Snippet Markers** option. In the illustration, clip 3 is inserted between clip 1 and 2 in video version 2. The audio

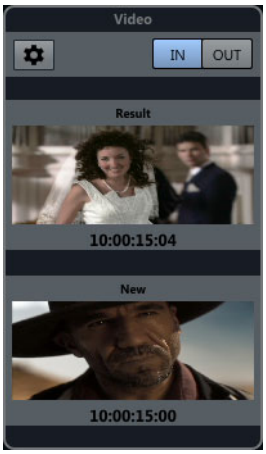
event audio 2 is divided in 2 sections. One of these events remains as an audio snippet connected to clip 1. An audio snippet marker is inserted at the position of the audio snippet. The **Audio Snippet** marker track displays the position of the audio snippet.

Video Preview

You can preview new and recut video material in the **Video** section of the **ReConform** dialog.

The video preview allows you to check if the ReConform process performs a correct recut of the available video material. The video preview displays the video track in a recut version that can be compared with the new video material. In general, these must match. If the new video material is longer or if it contains previously unavailable material, the resulting recut video preview shows no content. In other cases, where the previews differ, there may be an issue with the delivered video material or with the edits in the **Change EDL**.

Correct video preview



Erroneous video preview

The video preview displays video frames as soon as you select an entry in the **Change EDL**. You can switch to the last frame. The timecode shows the start or end times of the entry.

Technically, the new video material is copied onto a specific video track when the video preview is activated.

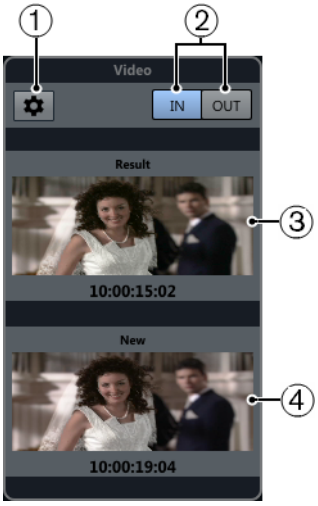
If you get new video material, you can select it in the video preview settings.

RELATED LINKS

Change EDLs on page 1127

Video Section

The **Video** section in the **ReConform** dialog displays video frames of the selected entry in the **Change EDL**.



1) **Open Video Preview Settings**
   Opens the video preview settings.

2) **IN/OUT**
   Allows you to switch between first (**IN**) and last (**OUT**) video frame. A highlighted button indicates which frame is active.

3) **Result**
   Displays the first or last video frame of the recut video track including the corresponding timecode.

4) **New**
   Displays the first or last video frame of the delivered new video track.

Video Preview Settings

The video preview settings allow you to specify the video tracks that the ReConform function uses for a recut.

To open the video preview settings, in the **Video** section, click **Open Video Preview Settings** ⚙.

Video Track Assignment

Allows you to specify which video track contains the old and which the new video material. If you are working on a project that contains a video track, this track is automatically selected as the one containing the old material.

New Video Track Configuration

Allows you to select one or multiple video files from the **Pool** to be used as the recut video material.

NOTE

- If you see no files, you must add them to the **Pool**.
- If you select several files, their timecodes may not overlap.

RELATED LINKS

Pool on page 572

Selecting Material for New Video Tracks

You can select video material from the **Pool** to be used for the recut version.

PREREQUISITE

You have added the video files to the **Pool**.

PROCEDURE

1. In the **New Video Track Configuration** section, activate one or multiple video files by clicking in the **Use as New Video** column next to the video file names.
2. Adjust the **Start** and **End** timecodes according to your needs.

Determining Old and New Video Tracks

You can determine which of the used video tracks contains the old and which the new material.

PROCEDURE

- In the **Video Track Assignment** section, click in the **Old** or **New** column next to the video track name.

  The other video track is automatically selected as the other version.

Audio editing to picture

Introduction

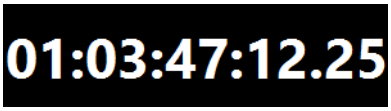
Nuendo has been designed from the ground up as a production tool with features that are catered to working with video and film. The depth and versatility of Nuendo's design allow you to work very precisely and yet retain the freedom and ease that allows greater creativity in creating music and sound design for film and video.

In this chapter, real world situations that you would encounter while working with video will be explained. These include the preparation of a video project, the addition of sound design elements, the conforming of audio material to picture changes, and the creation of tempo maps that are synchronized with video for use in scoring music to picture. Finally, the editing tools in Nuendo will be discussed as they relate to video postproduction techniques.

Video timeline and the grid

When working with video, every audio event and part is synchronized to the picture. Unlike music editing with an even grid of bars and beats to work with, video uses a much smaller increment of time as a basic grid: video frames. Since there are a finite number of video frames in each video, the frame becomes the basic measuring block for editing.

Video frames are numbered using SMPTE timecode. Depending on the frame rate of the video, there will be a certain amount of frames per second and then 60 seconds per minute, and 60 minutes per hour. SMPTE is displayed using colons to separate each division of time.



SMPTE timecode in the Time Display: showing 1 hour, 3 minutes, 47 seconds, 12 frames,and 25 subframes.

IMPORTANT

In the Project Setup dialog, make sure that the frame rate of the project matches that of the video. It is possible for Nuendo to detect the video frame rate for you.

Film frames can be displayed as SMPTE numbers or in feet and frames (a traditional method used by film editors). Nuendo also offers a user-definable frame rate for specialized frame rates including Varicam HD video.

RELATED LINKS

Video on page 1100
Frame rate (speed) on page 1064

Subframes and days

Nuendo can also display the time between frames by using the subframe division which divides each frame into 80 subframes. Subframes appear separated from frames by a period. In order to see subframes displayed you must activate “Show Timecode Subframes” in the Preferences dialog (Transport page). If this is activated, subframes will be displayed wherever timecode is shown including the Transport panel, Project window, dialogs, Project Browser, Pool, and the SMPTE Generator plug-in.

In case a project crosses the 24 hour mark, Nuendo will automatically display a day number to the left of the SMPTE display separated by a space, no colon. It can be necessary to use days in timecode even when the project is shorter than 24 hours. For example, during live events that take place in the evening, if the central timecode generator for the event is running “time-of-day” SMPTE that correlates to the actual time on the clock, the time display may cross the 24 h mark at midnight. In that case, all timecode values after midnight will have a “1” displayed in the days position.

Time-of-day SMPTE that has crossed midnight or the 24 hour mark shows the day number “1” to the left of the SMPTE value. Note that subframes are not displayed in this image.

Drop-frame SMPTE

Drop-frame timecode is used for the 29.97 fps frame rate used by the NTSC video standard and the 30 fps frame rate. Since this frame rate does not correlate exactly to the actual time passing on the clock, a system has been devised that omits certain frame numbers in order to match the displayed time with the time of day. Nuendo distinguishes this frame count by separating the frame number with a semicolon instead of a colon. When you see timecode displayed anywhere in Nuendo with a semicolon, you are using drop-frame timecode. This is the only indication besides looking at the Project Setup dialog, that you are using drop-frame timecode.

Drop-frame SMPTE timecode display with frames separated by a semicolon.

When the Project window's time display is set to timecode, the grid options change. The choices are:

- Subframe (1/80th of a frame)
- 1/4 frame (20 subframes)
- 1/2 frame (40 subframes)
- 1 frame
- 2 frames
- 1 second

These grid options allow editing, nudging and moving of events, fades and automation data in increments that relate to the video frames you can see.

Conforming production audio

Conforming audio to picture describes the process of editing and placing audio files in sync with the video. Once you have imported your video file or synchronized Nuendo with a VTR or other external video playback system, the next step is to get production audio imported and running in sync with the video. Production audio refers to any sound that was originally recorded during the filming or video taping process. This includes sounds and music added by the video editor in order to get an idea of the finished product.

Audio coming from a video editing session can come in a variety of formats. How to match the audio timecode values of these different formats to those used by the video editing suite will be described in the following sections.

Reference audio

Reference audio can be any audio that has been assembled and mixed in the video editing suite, usually as a guide for audio editors. It may be embedded in a video file, be a separate audio file or be recorded on tracks of a video tape recorder (VTR).

If the audio file is available in the Pool or the MediaBay, proceed as follows to conform it to the video file:

- Open the Media menu and select the "At Timecode Position…" option from the "Insert into Project" submenu.

  A window opens, where you need to enter the timecode value corresponding to the beginning of the video file. The reference audio file then lines up with the video file.

- Provided that the video file was inserted at the original timecode position and that the audio file contains origin timecode information, you can also use the "At Origin" command from the "Insert Into Project" submenu.

If you have already imported your audio file onto a track, proceed as follows to conform it to the video file:

- Activate the Snap On/Off button, open the Snap Type pop-up menu, and select “Events”. When you now drag the audio event to the start of the video event, the two events are aligned automatically.

Once the reference audio file has been inserted into position, check the sync of audio to video throughout the length of the project. If there are any issues, it is best to fix them before you go on editing. Problems with timecode frame rates, sample rates and synchronization to external tape machines can wreak havoc on a production if they are discovered late in the process.

Multi-channel media

Multi-channel media can contain multiple tracks of audio edited by the video editing suite. Multi-channel media interchange formats help you get the audio from one workstation to another. This is useful, when the audio edited by the video editor is complex and has elements that you want to use in the final project. Nuendo is capable of handling OMF, AAF, OpenTL, and AES31 files for this type of exchange.

The most commonly used format, the OMF file, comes in two basic formats: files with embedded audio and files that refer to external audio media. Both formats store information about where to place each piece of audio in the timeline. Each format has its strengths and weaknesses and the choice of which one to use will depend on the circumstances.

After importing the OMF, align your video file to play in sync with the OMF audio. Here is where any reference audio embedded in the video file will come in handy. By listening to both the OMF audio and reference audio tracks, you will easily be able to tell if everything is in sync.

Since the OMF audio was created during the video edit, its timecode values should be correct. Adjusting the position of the video and reference audio to match the OMF audio would be the common method of aligning the two together. To ensure that the video event and reference audio events remain in sync with one another during editing, group them or move them into a folder track and move the folder track events.

NOTE

When aligning reference audio from a video file to imported OMF audio, try panning the reference audio to one side and the OMF audio to the other. This makes it easier to discern whether one source is ahead of the other as they get closer to perfect sync. A comb filtering effect can be heard when two identical sources become very close in sync with one another.

Once the OMF audio is imported and all video and audio events are synchronized together, you are ready to begin adding new elements and creating the complete soundtrack.

RELATED LINKS

File handling on page 1187

EDLs

EDLs (Edit Decision Lists) are lists of edits created by the video editing suite. These text files contain timecode and source tape information that can be used to align audio events to a reference video file in Nuendo. Each step describes a complete editing task including:

- The type of edit (audio, video or both).
- The source material (tape number, audio file name or video file name).
- The start and ending source timecode values.
- The start and ending destination timecode values.

The source material must have correct timestamps in order for the EDL timecode values to be valid. This can be achieved using timecode DAT machines, video tape machines, or field recorders, provided that the device is able to create audio files with embedded timestamps. The files can then be directly imported in Nuendo and placed in the project “at origin”. When using a video tape machine, Nuendo has to be synchronized to the machine in order to record audio into the project at the correct timecode positions, thereby giving the audio files the correct timestamps.

The information contained in the EDL can be used in Nuendo to place audio events in the Project window at the specific timecode positions that correspond to the edits made in the video editing suite. Depending on the length of the program material and the number of edits, this process can be time-consuming but also allows for the most precise control over the source material and synchronization.

Since original source tapes and recordings are used, the maximum quality of those recordings can be maintained.

To conform an EDL edit, proceed as follows:

PROCEDURE

1. Create a folder track for the source material.

   Having all your source material in one consolidated area will lessen confusion later in the process.

2. Create an audio track for each source tape.

   For DAT and video tape machines, having a separate track for each tape will prevent overlap of audio with the same timecode values and also keep things organized.

3. Name each track the same name as the source tape it comes from.

   Each audio file you record on that track gets the name of the source tape it came from.

4. Make sure that Nuendo is synchronized to the tape machine.

   This ensures that the audio file is placed at the correct timecode position in the Project window.

5. Record all the significant portions of each source tape into Nuendo.

   If only a portion of a source tape is used in the EDL, record that section into Nuendo.

6. Import any audio files from a field recorder, open the Media menu and from the “Insert into Project” submenu select “At Origin”.

   Create as many tracks as necessary to prevent overlaps. Once the file has been placed “at Origin”, it can be used as a source for EDL conforming.

```
FCM: DROP FRAME

001  R1103    AA    C        00:21:29:19 00:21:35:21 01:00:00:00 01:00:06:02
* FROM CLIP NAME:  PRE SET A1

002  R0101    NONE  C        00:00:44:06 00:00:49:08 01:00:06:02 01:00:11:04
* FROM CLIP NAME:  URBAN 1
AUD   3     4

003  R0207    AA    C        00:11:10:02 00:11:19:05 01:00:11:10 01:00:20:13
* FROM CLIP NAME:  OFFSTAGE B
```

An excerpt from a CMX EDL

7. Use the Range Selection tool to create a selection on the proper source track based on the two source timecode values.

   This can be done via manual entry in the info line. In this example, enter 00:21:29:19 for the range start and 00:21:35:21 for the range end.

8. Open the Edit menu and select Copy.

   The source material is copied into the clipboard.

9. Use the Range Selection pop-up menu to switch range selections.

   Using the two different range selections (A and B) will keep the source and destination times separate. This is similar to a four-point editing model used by many video and audio editors.

10. With the Range Selection tool, create a selection on a destination track using the two destination timecode values.

    This can be done via manual entry in the info line. It is only necessary to define the destination in timecode since the paste function will automatically place an audio event of the correct size as determined by the source range.

    NOTE

    The amount of destination tracks should be determined by the number used in the EDL. Some EDL formats only allow the use of 4 destination tracks. Your needs may vary according to the project itself. The main concern is getting the audio events in sync with the video. Once that is completed, placing audio events on various tracks is up to the user.

11. Open the Edit menu and select Paste.

    This places the source material at the destination location. Check for sync with the video and reference audio.

12. Repeat as needed until the entire EDL is conformed.

    Depending on the size of the EDL and number of edits, this process may take some time to be completed.

RESULT

Once you have successfully imported video and reference audio and conformed any production audio to the video, you are ready to begin adding new sound elements and creating the final soundtrack.

RELATED LINKS

Four-point editing with the Range Selection tool on page 1150
Creating Different Selection Ranges on page 215

Adding sound design elements

Sound design elements can come from a variety of sources including sound effect libraries on CD or hard drives, field recordings and even the production audio source tapes. In order to add these sounds to your project, they must be imported into the Pool or recorded into Nuendo from a tape machine.

NOTE

Create various folders within the Pool to help organize all the sound files used in your Project. With feature length films, the amount of audio can be staggering. Finding specific audio files can become daunting quickly unless you properly organize your project. Nuendo's MediaBay is designed to help you organize all your sound files so that they are instantly accessible to you and can be quickly searched.

Placing events to picture

Select one of the following methods to place your audio events to picture:

- Select the audio file in the Pool, open the context menu and select the "At Timecode Position" command from the "Insert into Project" sub-menu.

  The audio event is inserted at the specified timecode position on the topmost selected track in the Project window. The right timecode number could come from an EDL or a cue list created earlier or from a locator position or marker.

- View the video using the shuttle and scrub tools, set the left locator at the position where you want to place the audio event and set the cursor to the left locator. Select the audio file in the Pool, open the Media menu and from the "Insert into Project" submenu select the "At Cursor" option.

- Activate the Edit Mode on the Transport menu, drag the audio events out of the Pool and place them on a track.

  Edit Mode will cause the video to follow the event as you move it in the Project window. Drag the event to the right video frame. You can use the Snap function to keep the audio event lined up with each timecode frame as you drag it into position.

- Use four-point editing with the Range Selection tool.

  This is described below.

Four-point editing with the Range Selection tool

It is often necessary to go through a large sound file to find a specific sound effect. This is especially true for field recordings with multiple takes of each sound and dead air time in between. In this situation, it might be best to set up an area in the project consisting of several "work" tracks that can be used to sort out various sound files and prepare them for use in the final soundtrack.

Using the Range Selection tool, a four-point editing model can be used to cut out ranges of the work tracks and paste them onto the proper tracks lined up with specific video frames.

PROCEDURE

1. Create a folder track and name it “Work Tracks”.

   This folder track will host several audio tracks that can be used as a scratch pad for editing sound effects and preparing them for use in the project.

2. Create several tracks to work on.

   You might need mono, stereo, and 5.1 audio tracks depending on the source material you are working with.

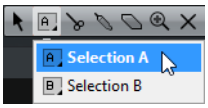
   A folder track with four stereo work tracks can be used to edit various sound files before they are placed to picture.

3. Drag the various audio files onto these work tracks.

   Many sound effects libraries contain several versions of a particular sound effect. These can be auditioned and chosen directly on the work tracks. We recommend to place them at a time in the project that is after the end of the program material. This prevents your work tracks from getting inadvertently included in the final mix.

4. With the Range Selection tool, select the audio you want to use with the picture and press [Ctrl]/[Command]-[C] to copy it to the clipboard.

   You can place several sound effects lined up together and select them all with the Range Selection tool for editing.



5. Use the Range Selection pop-up menu to switch range selections.

6. Define the destination range for selection B.

   Using the key commands [E] (Left Selection Side to Cursor) and [D] (Right Selection Side to Cursor), you can define the range selection on the fly while watching the video.

7. Press [Ctrl]/[Command]-[V] to paste the clipboard data to the new location.

   Note that you can set up a macro that combines the copy and paste processes. This can considerably speed up your work.

   One very handy feature in using selections A and B is the ability to retain the view of each selection. If your work area is far away from the edit insertion point in the video (A is far away from B), zooming in closely to either location will leave the other outside the Project window viewing area. Changing selections between A and B will also cause the viewing area of the Project window to switch between the two locations

instantly. This is really the key to this technique, allowing you to move quickly between source and destination audio while retaining two selections for editing.

Adjusting events to picture

Once audio events have been placed to picture, their fades, durations and positions can be fine-tuned.

Nuendo's nudge features are designed just for this type of use. As the nudge buttons are not displayed on the toolbar by default, you have to right-click on the toolbar and select "Nudge Palette" from the context menu to access them.

Using the nudge buttons you can incrementally adjust the position (move) and size (trim) of your events. Depending on Object Selection tool mode, the nudge buttons will trim the events by moving the boundaries (Normal Sizing) or moving the contents inside the event (Sizing moves contents).

The size of the nudge increment is determined by the grid settings in the Project window. A typical nudge setting for picture editing would be 1 frame. However, even though the video's resolution might be no more than one frame, half-frame or even quarter-frame amounts could be necessary to accurately time events to picture.

Edit Mode is extremely helpful for fine-tuning event placement to picture. Since the video follows each edit you make with the mouse, you can instantly see where in the video your edit is taking place, whether that be the start position of an event, snap point or fade duration. This makes editing to picture fluid and more creative.

The Range Selection tool offers additional methods of editing including Cut Head, Cut Tail, Crop and Adjust Fades to Range. In Edit Mode, creating and adjusting the range will chase video so defining a range can be done visually to picture.

Conforming to picture changes

During the postproduction process, it is often necessary to make changes to the overall timeline of a project. When any change is made to the video, i. e. when video is cut or inserted, those changes must be reflected in the audio as well.

This can be achieved with the Range Selection tool. The key is to retain the relative positions of every event in the project after the edit is performed. For example, if a portion of video is removed, removal of events on all tracks including markers, MIDI, automation, and tempo tracks is necessary for everything to remain in sync after the edit point.

Picture cut

To make a picture change involving the removal of existing video, proceed as follows:

PROCEDURE

1. Determine the starting point and duration of the section to be removed.

   This information should come from the video editor in the form of timecode values specifying the start point and duration of each cut. When several changes are made to a video, information about those changes comes in the form of a “change list”. Reference video and audio can also be used to figure this out and also double check the edit once it is complete.

2. Select the Range Selection tool and on the Edit menu–Select submenu, choose “Select All”.

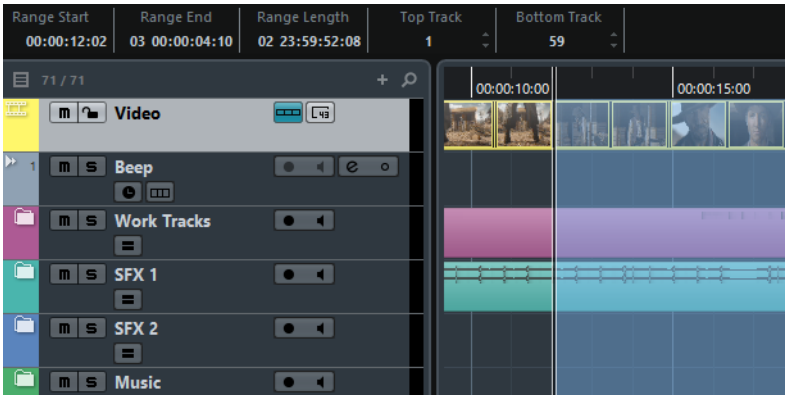
   This automatically selects all different types of tracks in your project including MIDI, Marker, Tempo, and Video.

3. Deselect the video track with the new edited version and lock this and any other reference track.

   This prevents accidental editing.

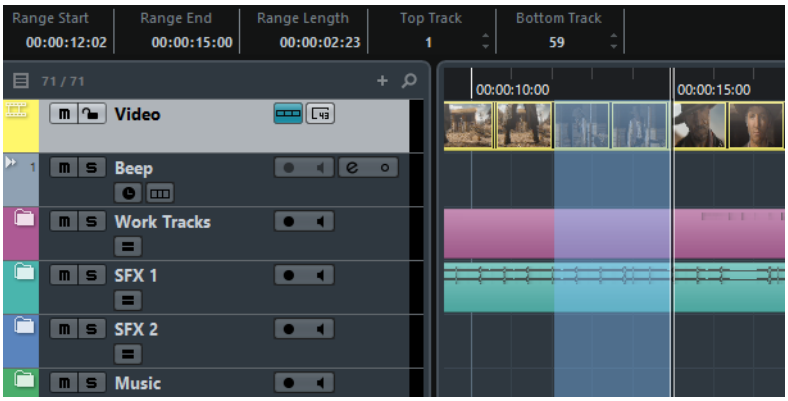
4. In the Range Start field in the info line, enter the starting frame of the video change edit.

   This is the first video frame to be removed. You can also locate the cursor to the starting frame and press [E] (“Left Selection Side to Cursor”). Make sure that Snap is active, Snap Type is set to “Grid” and Grid Type is set to “1 frame”.



5. In the Range Length field in the info line, enter the duration of the cut.

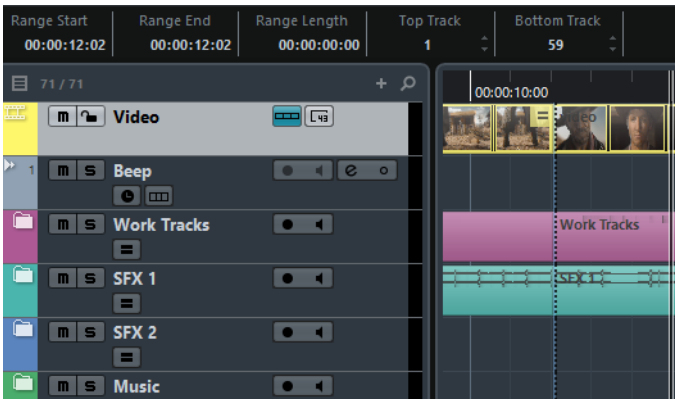
   Now the range selection encompasses all the events in the project that are to be removed together with the old video.



The range has been defined for the cut on all tracks.

6. On the Edit menu–Range submenu, select “Cut Time”.

   This will remove the selected area and move all the following events to the left by the same amount, filling the gap. The audio should now play in sync with the new video from the edit point on to the end.



The edit is complete. All events to the right have been moved to fill the gap.

Once the edit is complete, import the new video file and check the sync of audio to video through the edit point. Reference audio from the new video can be useful for checking your edits.

IMPORTANT

Once the new video and reference audio have been placed in the Project window, you may lock those tracks to prevent inadvertent editing later.

Picture insert

To make a picture change involving the addition of video material, proceed as follows:

PROCEDURE

1. Locate the insertion point where the video has been added.

   This information comes from the video editor’s change notes.

2. Select the Range Selection tool and on the Edit menu–Select submenu, choose “Select All”.

   This automatically selects all tracks in your project.

3. In the Range Start field in the info line, enter the starting frame of the insertion.

   You can also locate the cursor to the starting frame and press [E] ("Left Selection Side to Cursor").

4. In the Range Length field in the info line, enter the duration of the inserted video.

   This creates a selection of the same size as the inserted video.

5. On the Edit menu–Range submenu select "Insert Silence".

   Blank space is inserted and all events will be moved to the right to make room.

Synchronize tempo maps to picture

You can use the Time Warp feature in Nuendo to create tempo maps that are synchronized with video for use in scoring music to picture. When scoring to picture, tempo changes in the music often need to follow specific visual elements on screen. Using the Time Warp feature with Edit Mode allows you to make these changes easily while viewing video.

RELATED LINKS

Matching a musical score to video on page 992

Using standard Nuendo tools for postproduction purposes

In this section the Nuendo editing tools related to video postproduction techniques are described.

Inserting audio into the project

The options listed below can be used with video to place audio events precisely at the video frame you choose.

Select your audio events in the Pool and use the "Insert into Project" options from the Media menu to place them in the Project window.

RELATED LINKS

Inserting Clips into a Project on page 579

Using the Marker window as a spotting list

In the following section we will describe how to add markers and use the Marker window to position your audio events.

A spotting list is created by viewing a film or video and determining where certain sound effects and other audio elements will go during postproduction. The list consists of timecode values and descriptions of the sounds that will go there. For example:

Timecode	Description
01:07:36:15	Footsteps on concrete
01:07:53:02	Telephone rings
01:08:06:07	Explosion outside

In this list, there are three timecode locations and various sounds that are needed at those points in the video. During editing, sound effects could simply be placed using these timecode values and be relatively close to final position without much effort. To make it even faster, use the Marker window as a spotting list.

As you view a video in Nuendo, have the Marker window open, and as you spot places where sound effects need to be inserted, add a marker. With the Marker window open, you will see the newly created marker in the list. Once you complete the description and enter it, you can create another marker instantly, making it possible to create an entire spotting list on-the-fly in Nuendo.

After importing sound effects from a library or field recordings, they can be placed in the project using the Insert at Cursor option, moving the cursor to each marker by double-clicking in the very left column of the Marker window next to the desired number.

While the positioning of the audio events in this case might not be exact, it will quickly get audio in close proximity to the needed position. Fine tuning can be done later with other editing tools and features.

RELATED LINKS

Markers on page 312

Event handles

The event handles (fade in, fade out, and volume) are extremely useful for working with picture since their functions are tied to the event itself. When the event moves, so do the fades and volume level.

Since the event fades and volume are handled in real time, you can hear the results of your edits instantly. As long as you let go of the event handle before the cursor reaches the event during playback, you hear the result of your edit. Being able to edit while playback continues gives you more time and freedom to work while others are still listening to the playback.

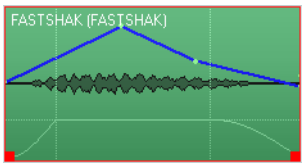
RELATED LINKS

Fades, crossfades, and envelopes on page 274

Event envelopes

For even more control, the event envelope provides another type of volume control over the audio event. Instead of controlling only fade ins and outs or the overall volume of the event, envelopes can alter the volume of audio anywhere within the event.

To access the event envelope, select the Draw tool and simply click within any audio event. A volume envelope line appears with a new curve point. Unity gain (no change) is where the envelope line is at the very top of the event. Any curve points below indicate gain reduction at that point. The waveform display reflects the change in volume for visual feedback as you edit. You can add as many curve points as you like by clicking again with the Draw tool, giving you the ability to contour the volume of the event very precisely. To remove a curve point, drag it with the Draw tool outside the event.



An event envelope with several curve points. Notice that the volume curve with fades and theoverall volume is still displayed. The combination of the envelope and volume curve will determine the final audio level for each event.

IMPORTANT

One advantage to both the event handles (volume curve) and the event envelope is that their effects occur prior to the audio signal entering the mix engine of Nuendo. For example, if you have a compressor plug-in on a track in Nuendo and you increase the volume of an event on that track by using the volume handle, the compressor plug-in will see a greater input signal, altering its gain reduction accordingly. This can be very advantageous, e.g. when evening out levels in dialog tracks.

RELATED LINKS

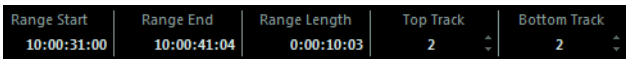
Fades, crossfades, and envelopes on page 274

Range selection

Using the Range selection tool to edit audio to picture opens up many other possibilities and functionality. When you make selections with the Range selection tool, the info line displays the start, end and length of the selection. The length indication is a handy timecode calculator when the project timeline is viewed in timecode. The start and end track numbers are also shown, outlining the top and bottom of the selection. All the values in the info line are editable.

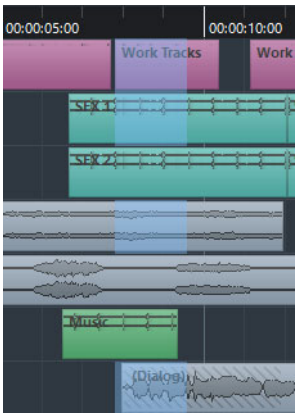
- Altering the start moves the selection without changing its length.
- Altering the end changes the length of the selection.
- Altering the length changes the end time to match the desired length.

- Altering the first track number will change the number of the topmost track in the selection.
- Altering the last track will change the number of the bottom track in the selection. All tracks in between these two will be included in the selection.



The info line while using the Range selection tool. Notice the top and bottom track numbers at the right of the display.

It is also possible to select non-contiguous tracks in a range selection by [Alt]/[Option]-clicking within the borders of the selection on the track you wish to add to the range. Only that track area will be added. This can be repeated to add other tracks to the range.



Non-contiguous range selection. The track placement of this data is retained in the clipboard.

There are also functions that let you alter the range selection using the cursor, event boundaries, left and right locators, and the start and end of the project. These functions are found in the Edit menu–Select submenu.

When these operations are assigned to key commands, the increase in speed and efficiency for creating range selections can be considerable.

By using these commands in various combinations, it is possible to create range selections quickly based on event boundaries, cursor and locator positions, and on-the-fly “capturing” during playback. These workflow improvements can become indispensable for many postproduction tasks.

RELATED LINKS

Range Editing on page 213
Editing Selection Ranges on page 216

Range editing

Once you have a range selection defined, there are many editing operations that can be performed to the selection. Some of these range edits have been designed expressly for postproduction in order to streamline workflow and increase efficiency and creativity. Others include the standard editing functions cut, copy and paste along with mouse operations to move selected audio.

You can also use the “Cut Head” and “Cut Tail” functions on the Edit menu for the editing of ranges and events. Furthermore you can use the “Adjust Fades to Range” command on the Audio menu.

IMPORTANT

Range editing can affect any type of event in the Project window including video, MIDI, markers, and automation data. When performing edits that affect the entire timeline (editing picture changes for instance) range edits can be very effective.

RELATED LINKS

Range Editing on page 213
Creating and adjusting fades with the Range Selection tool on page 275
Using Cut Head and Cut Tail on page 206

Edit Mode

When editing to video, it is always important to know how each edit relates to the exact frame of video where it occurs. Video playback follows the Nuendo transport, so that the video frame at the current project cursor position is shown, during playback and in Stop mode (e.g. if you move the project cursor manually or use fast forward/rewind). However, if you perform event or range-based editing tasks you will get no visual feedback. The special Edit Mode solves this problem, allowing you to edit audio while getting continuous visual feedback on the video display:

- If you activate “Edit Mode” on the Transport menu, the project cursor will automatically follow when you make selections or perform editing operations (such as moving, resizing, adjusting fades, etc.).

  Because the video automatically follows the project cursor, you will instantly get a visual feedback when you edit! This makes it very easy to move an audio event to a certain spot in the video, for example.

- To avoid obscuring the view, the project cursor is hidden from the event display in Stop mode if Edit Mode is activated.

  However, it is always displayed in the ruler.

Listed below are some examples of how you can use Nuendo’s Edit Mode for matching audio and MIDI to video.

Edit Mode: Object Selection tool

When editing events with the Object Selection tool, Edit Mode causes the video to follow your motions as you drag events and event handles. For instance, when you click and drag one or more events, the video will follow the left edge of the first event while you drag, giving you visual feedback on the position in the video. This is very helpful while placing sound effects to picture since you can see things in the video as you move sounds around in the Project window. Lining up sound effects to their visual counterparts becomes quite easy and quick.

Edit Mode follows the snap point of each audio event. If the snap point has not been modified, it remains at the start of the event. It can often be necessary to align a portion of audio in the middle of the event. Adjusting the snap point to a position in the audio event that is timing sensitive will allow you to use Edit Mode to visually line up that position to the video.

For example, the sound of a car skidding to a stop might be easily timed to picture by lining up the end of the skid sound with the stopping of the car in the video. The car might come into the frame after the skidding had begun, thereby making it very difficult to align the sound quickly without a starting point reference. The snap point overcomes this problem by allowing you to reference another point in the audio event. By moving the snap point to the end of the skidding sound, Edit Mode can be used to line that point with the stopped car on screen.

When adjusting fade handles, the video will follow the position of the fade handle as you move it, allowing you to position fades exactly in time with the video.

Edit Mode: Range Selection tool

When making range selections, Edit Mode causes the video to follow the range as you make the selection.

If you have a video section and an audio event for it that does not quite fit, you can use time stretch to change the length of the audio:

PROCEDURE

1. Position the start of the audio event at the correct position according to the video.
2. In Edit Mode, select the Range Selection tool and double-click on the audio event.

   This creates a selection range that spans the whole audio event.
3. Click the right edge of the selection range and drag to adjust it to the desired length.

   While you are dragging, the project cursor position follows the right edge of the range, allowing you to pinpoint the desired end position in the video.
4. Use “Locators to Selection” (on the Transport menu) to set the locators to the selection range you just made.
5. With the Object Selection tool, select the audio clip to be stretched.
6. On the Audio menu–Process submenu, select “Time Stretch”.

   The Time Stretch dialog opens.
7. Click the “Use Locators” button.

   The time stretch ratio is set up so that the audio event will fit the locator range.

   IMPORTANT

   Make sure that you do not exceed the 75% to 125% limit!
8. Make the desired settings and click Process.

   The audio is stretched or compressed to fit the range.

Edit Mode: Range Selection Tool with audio fading in

If you want the audio to fade in, reaching full volume at a certain position in the video, and fade out at another position, here is a quick way of achieving this:

IMPORTANT

This assumes that the audio event is already positioned and sized correctly according to the video.

PROCEDURE

1. In Edit Mode, select the Range Selection tool.
2. Make a selection range in the audio event, roughly covering the section that you want to be played at full volume.
3. Click and drag the edges of the selection range so that they exactly correspond to the end of the fade-in and the start of the fade-out, respectively.

   While you are dragging, the project cursor position follows the edge of the range, allowing you to pinpoint the desired fade-in and fade-out position in the video.
4. Pull down the Audio menu and select “Adjust Fades to Range”.

   The fade-in and fade-out handles of the audio events are automatically adjusted.

   NOTE

   When using the fade handles of an audio event in Edit Mode, the cursor will follow their position as well, allowing you to adjust fades to picture in this manner.

Edit Mode: Nudge commands

Nudging of events or range selections will also cause the video to move to the nudge position. All nudge commands (start, position, and end) will have this behavior in Edit Mode.

Text editing

For extremely precise editing, text entry may be used to perform most editing tasks in Nuendo. The info line in the Project window gives you instant access to any selected event’s data including start and end points, duration, offset, snap point, fade-in, and fade-out durations. Additionally, the Project Browser allows text editing of each event in the project in a list view including automation data, video events, and markers.

Text editing can be useful when conforming audio to edit decision lists (EDLs) created by video editors. A list of audio files will be shown with source and destination timecode values that can be used to place audio events in Nuendo.

```
001    BL   V    C       00:00:00:00 00:31:06:10 00:59:57:00 01:31:03:10
002  4       A2   C       18:10:50:09 18:11:43:06 01:31:03:10 01:31:56:07
* POLICE STATION V SEES H PA (2)
* POLICE STATION V SEES H PO (2)
* >>MEDIAFILE POLICE STATION V SEES H PA (2)
* FROM CLIP NAME: POLICE STATION V SEES H PO (2)
* FROM SCENE: 66A TAKE 6
003  4       A    C       20:02:58:11 20:03:04:17 01:31:03:10 01:31:09:16
* MOTEL V - H POV    TA (4)
* MOTEL V - H POV    TAKE 2
* >>MEDIAFILE MOTEL V - H POV    TA (4)
* FROM CLIP NAME: MOTEL V - H POV    TAKE 2
* FROM SCENE: 69F
004  4       A    C       19:52:52:16 19:52:54:21 01:31:09:16 01:31:11:21
* MOTEL H STAND V POVA (2)
* MOTEL H STAND V POV (1)
* >>MEDIAFILE MOTEL H STAND V POVA (2)
* FROM CLIP NAME: MOTEL H STAND V POV (1)
* FROM SCENE: 69E
```

An EDL with source and destination timecode values.

RELATED LINKS

Markers on page 312

ReWire

Introduction

ReWire is a special protocol for streaming audio between two computer applications.

Developed by Propellerhead Software and Steinberg, ReWire provides the following possibilities and features:

- Realtime streaming of up to 256 separate audio channels, at full bandwidth, from the “synthesizer application” into the “mixer application”.

  In this case, the “mixer application” is of course Nuendo. An example of a “synthesizer application” is Propellerhead Software’s Reason.

- Automatic, sample accurate synchronization between the audio in the two programs.
- The possibility to have the two programs share one audio card and take advantage of multiple outputs on that card.
- Linked transport controls that allow you to play, rewind, etc., either from Nuendo or from the synthesizer application (provided it has some kind of transport functionality).
- Automatic audio mixing functions of separate channels as required.

  In the case of Reason, for example, this allows you to have separate channels for the different devices.

- Additionally, ReWire offers the possibility to route MIDI tracks in Nuendo to the other application, for full MIDI control.

  For each ReWire compatible device, a number of extra MIDI outputs will be made available in Nuendo. In the case of Reason, this allows you to route different MIDI tracks in Nuendo to different devices in Reason, with Nuendo serving as the main MIDI sequencer.

- The overall load on your system is much reduced, compared to when using the programs together in the conventional way.

Launching and quitting

When using ReWire, the order in which you launch and quit the two programs is very important.

Launching for normal use with ReWire

PROCEDURE

1. First launch Nuendo.
2. Enable one or several ReWire channels in the ReWire Device dialog for the other application.
3. Launch the other application.

   It may take slightly longer for the application to start when you are using ReWire.

RELATED LINKS

Activating ReWire channels on page 1165

Quitting a ReWire session

When you are finished, you also need to quit the applications in a special order.

PROCEDURE

1. First quit the synthesizer application.
2. Then quit Nuendo.

Launching both programs without using ReWire

We cannot think of any scenario, in which you would need to run Nuendo and the synthesizer application simultaneously on the same computer, without using ReWire, but you can.

PROCEDURE

1. First launch the synthesizer application.
2. Then launch Nuendo.

   NOTE

   Please note that the two programs now compete for system resources such as audio cards, just as when running either with other, non-ReWire audio applications.

Activating ReWire channels

ReWire supports streaming of up to 256 separate audio channels. The exact number of available ReWire channels depends on the synthesizer application. Using the ReWire Device panels in Nuendo, you can specify which of the available channels you want to use.

PROCEDURE

1. Open the Devices menu and select the menu item with the name of the ReWire application. All recognized ReWire compatible applications will be available on the menu.

   The ReWire panel appears. This consists of a number of rows, one for each available ReWire channel.

2. Click on the power buttons to the left to activate/deactivate the desired channels.

   The buttons light up to indicate activated channels. Please note that the more ReWire channels you activate, the more processing power is required.

   For information about exactly what signal is carried on each channel, see the documentation of the synthesizer application.

3. If desired, double-click on the labels in the right column, and type in another name.

   These labels will be used in the Nuendo MixConsole to identify the ReWire channels.

Using the transport and tempo controls

IMPORTANT

This is only relevant if the synthesizer application has some sort of built-in sequencer or similar.

Basic transport controls

When you run ReWire, the transports in the two programs are completely linked. It does not matter in which program you play, stop, fast forward or rewind. However, recording (if applicable) is still completely separate in the two applications.

Loop settings

If there is a loop or cycle facility in the synthesizer application, that loop will be completely linked to the cycle in Nuendo. This means that you can move the start and end point for the loop or turn the loop on or off in either program, and this will be reflected in the other.

Tempo settings

As far as tempo goes, Nuendo is always the master. This means that both programs will run in the tempo set in Nuendo.

However, if you are not using the tempo track in Nuendo, you can adjust the tempo in either program, and this will immediately be reflected in the other.

IMPORTANT

If you are using the tempo track in Nuendo (i.e. the Tempo button is activated on the Transport panel), you should not adjust the tempo in the synthesizer application, since a tempo request from ReWire will automatically deactivate the tempo track in Nuendo!

How the ReWire channels are handled

When you activate ReWire channels in the ReWire Device panels, they will become available as channels in the MixConsole.

The ReWire channels have the following properties:

- ReWire channels may be any combination of mono and stereo, depending on the synthesizer application.
- ReWire channels have the same functionality as regular audio channels.

  This means you can set volume and pan, add EQ, insert effects and sends, and route the channel outputs to groups or busses. However, ReWire channels have no monitor buttons.
- All channel settings can be automated using the Read/Write buttons.

  When you write automation, channel automation tracks will automatically appear in the Project window. This allows you to view and edit the automation graphically, just as with VST instrument channels, etc.
- You can mix down the audio from ReWire channels to a file on your hard disk with the Export Audio Mixdown function.

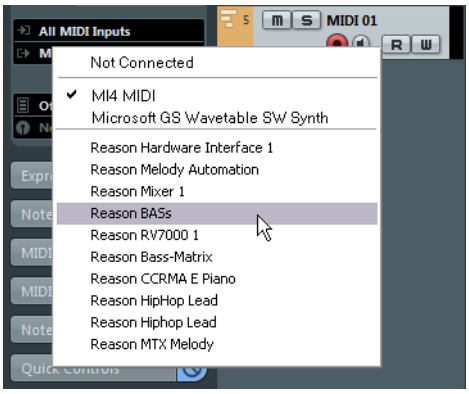
  You can export the output bus to which you have routed the ReWire channels. You can also export individual ReWire channels directly – “rendering” each ReWire channel to a separate audio file.

RELATED LINKS

Mixing down to audio files on page 1019

Routing MIDI via ReWire

When using Nuendo with a ReWire-compatible application, additional MIDI outputs will automatically appear on the MIDI Output pop-up menus for MIDI tracks. This allows you to play the synthesizer application via MIDI from Nuendo, using it as one or several separate MIDI sound sources.



The MIDI outputs for a Reason song. Here, each output goes directly to a device in the Reason rack.

- The number and configuration of MIDI outputs depends on the synthesizer application.

Considerations and limitations

Sample rates

Synthesizer applications may be limited to audio playback in certain sample rates. If Nuendo is set to a sample rate other than those, the synthesizer application will play back at the wrong pitch. Consult the documentation of the synthesizer application for details.

ASIO drivers

ReWire works well with ASIO drivers. By using the Nuendo bus system you can route sounds from the synthesizer application to various outputs on an ASIO compatible audio card.

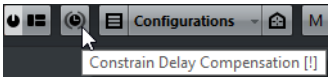
Key Commands

Introduction

Most of the main menus in Nuendo have key command shortcuts for certain items on the menus. In addition, there are numerous other Nuendo functions that can be performed via key commands. These are all default settings.

You can customize existing key commands to your liking, and also add commands for many menu items and functions that currently have no key command assigned.

You can find out for which functions key commands can be assigned by looking in the Key commands dialog (see below), or by checking the tooltip for a particular interface element. If a tooltip shows [!] at the end, you can assign a key command to this function. Assigned key commands are shown in the tooltips in square brackets.



IMPORTANT

You can also assign tool modifier keys, i.e. keys that change the behavior of various tools when pressed. This is done in the Preferences dialog.

RELATED LINKS

Setting up tool modifier keys on page 1177

How are key commands settings saved?

Every time you edit or add any key command assignment, this is stored as a global Nuendo preference – not as part of a project. If you edit or add a key command assignment, any subsequent projects that you create or open will use these modified settings. However, the default settings can be restored at any time by clicking the Reset All button in the Key Commands dialog.

In addition, you can save complete or partial key commands settings as a “key commands file”, which is stored separately and can be imported into any project. This way you can quickly and easily recall customized settings, when moving projects between different computers, for example. The settings are saved in an XML file on the hard disk.

RELATED LINKS

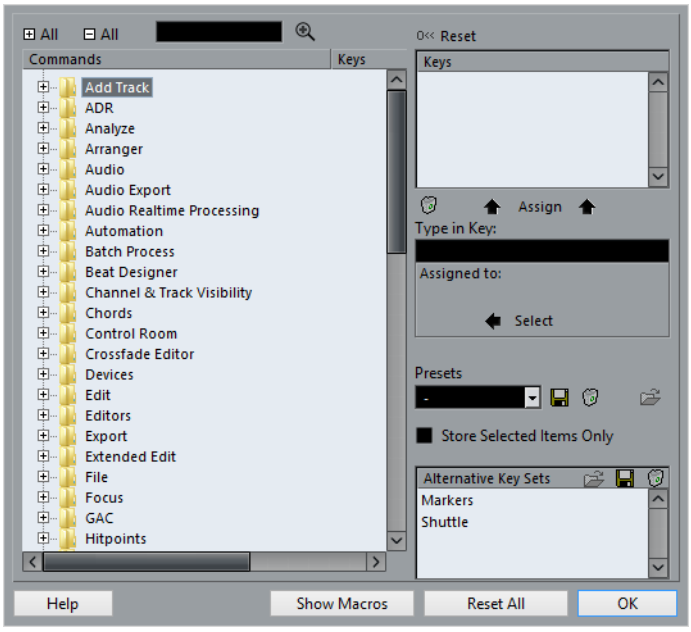
Saving complete key commands settings as presets on page 1173

Setting up key commands

Adding or modifying a key command

In the Key Commands dialog you will find all main menu items and a large number of other functions, arranged in a hierarchical way similar to the Windows Explorer and Mac OS Finder. The function categories are represented by a number of folders, each containing various menu items and functions.

When you open a category folder by clicking the "+" sign beside it, the items and functions it contains are displayed with the currently assigned key commands.



To add a key command, proceed as follows:

PROCEDURE

1. Open the File menu and select "Key Commands…".

   The Key Commands dialog opens.

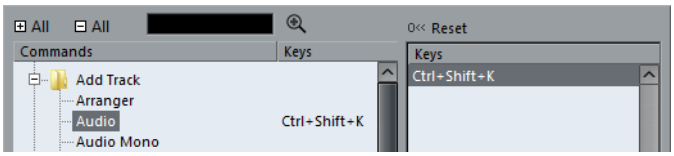
2. In the Commands list on the left, choose a category.

3. Click the "+" sign to open the category folder and display the items it contains.

   Note that you can also click the "global" "+" and "-" signs in the top left corner to open and close all category folders at once.

4. In the list, select the item to which you want to assign a key command.

   Already assigned key commands are shown in the Keys column as well as in the Keys section in the top right corner.



5. Alternatively, you can use the search function in the dialog to find the desired item.

   For a description of how to use the search function, see below.

6. When you have found and selected the desired item, click in the “Type in Key” field and enter a new key command.

   You can choose any single key or a combination of one or several modifier keys ([Alt]/[Option], [Ctrl]/[Command], [Shift]) plus any key. Just press the keys you want to use.

7. If the key command you enter is already assigned to another item or function, this is displayed below the “Type in Key” field.

   You can either ignore this and proceed to assign the key command to the new function instead, or you can select another key command.

8. Click the Assign button above the field.

   The new key command appears in the Keys List.

   IMPORTANT

   If the key command you enter is already assigned to another function, you will get a warning message asking if you really want to reassign the command to the new function.

9. Click OK to exit the dialog.

   NOTE

   You can set up several different key commands for the same function. Adding a key command to a function that already has another key command will not replace the key command previously defined for the function. If you wish to remove a key command, see below.

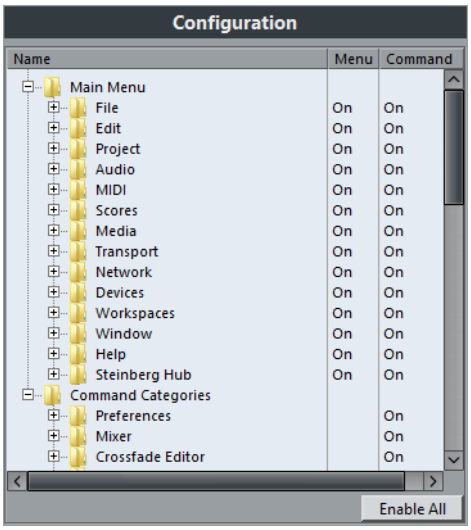
Turning key commands off

Nuendo also gives you the option of turning key commands off, meaning that even if a function has a key command assigned to it, you can disable the key command.

PROCEDURE

1. Open the Preferences dialog from the File menu (under Mac OS X it is located on the Nuendo menu) and select the Configuration page.

   As you can see, the Configuration page contains two main folders; “Main Menu” and “Command Categories”.



- The “Main Menu” folder contains a number of subfolders, which each contain items found on the main menus in Nuendo.
- The “Command Categories” folder also contains a number of subfolders, each of which contains a number of program functions not available on any of the main menus.

All the items and functions in the subfolders can have key commands assigned to them. The column to the right, labeled “Command”, allows you to set the On/Off status for the corresponding items. This indicates whether it is possible to use assigned key commands for the items or not.

2. Click on the “+” sign beside one of the main folders to open it and list the subfolders it contains.
3. Open the desired subfolder by clicking its “+” sign, navigate to the item for which you want to disable the assigned key command, and select it.
4. Click in the “Command” column beside the item to set the status to “Off”.

   Now it will not be possible to use any key command assigned to that menu item or function.
5. Repeat this for all items or functions for which you want to disable key commands.

NOTE

Note that if you set an entire subfolder to “Off” in this way, all the items or functions it contains will automatically be set to “Off” as well. If this is not what you want, you can reset separate items in the subfolder to “On”.

6. When you are done, click OK to close the Preferences dialog and apply the changes.

Searching for key commands

If you want to know which key command is assigned to a certain function in the program, you can use the Search function in the Key Commands dialog.

PROCEDURE

1. Click in the search text field at the top left of the dialog and type in the function for which you want to know the key command.

   This is a standard word search function, so you should type the command as it is spelled in the program. Partial words can be used; to search for all quantize related commands, type “Quantize”, “Quant”, etc.

2. Click the Search button (the magnifying glass icon).

   The search is conducted and the first matching command is selected and displayed in the Commands list below. The Keys column and the Keys list show the assigned key commands, if any.

3. To search for more commands containing the word(s) you entered, click the Search button again.

4. When you are done, click OK to close the dialog.

Removing a key command

PROCEDURE

1. Use the list of categories and commands to select the item or function for which you wish to remove a key command.

   The key command is shown in the Keys column and the Keys list.

2. Select the key command in the Keys list and click the Delete button (the trash icon).

   You are asked whether you really want to remove the key command.

3. Click Remove to remove the selected key command.

4. Click OK to close the dialog.

Setting up macros

A macro is a combination of several functions or commands to be performed in one go. For example, you can select all events on the selected audio track, remove DC offset, normalize the events and duplicate them, all with a single command.

Macros are set up in the Key Commands dialog as follows:

PROCEDURE

1. Click the Show Macros button.

   The macro settings are shown in the lower part of the dialog. To hide these from view, click the button (now renamed Hide Macros) again.

2. Click New Macro.

   A new, unnamed macro appears in the Macros list. Name it by typing the desired name. You can rename a macro at any time by selecting it in the list and typing in a new name.

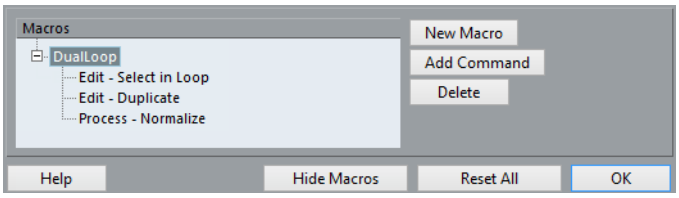
3. Make sure that the macro is selected, and use the categories and commands in the upper half of the dialog to select the first command you want to include in the macro.

4. Click Add Command.

   The selected command appears in the list of commands in the Macros section.

5. Repeat the procedure to add more commands to the macro.

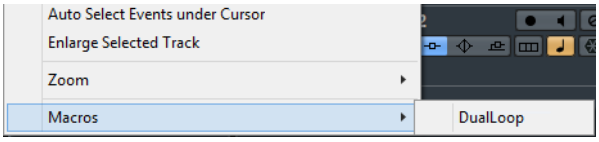
   Note that commands are added after the currently selected command in the list. This allows you to insert commands "in the middle" of an existing macro.



A macro with three commands

- To remove a command from the macro, select it in the Macros list and click Delete.
- Similarly, to remove an entire macro, select it in the Macros list and click Delete.

After you have closed the Key Commands dialog, all macros you have created appear at the bottom of the Edit menu in the Macros submenu, available for instant selection.



You can also assign key commands to macros. All macros you have created appear in the upper section of the Key Commands dialog under the Macros category – just select a macro and assign a key command as with any other function.

Saving complete key commands settings as presets

As mentioned above, any changes made to the key commands are automatically stored as a Nuendo preference. However, it is also possible to save key commands settings separately. This way, you can store any number of different key command settings, complete or partial, as presets for instant recall.

PROCEDURE

1. Set up the key commands to your liking.

   When setting up key commands, remember to click "Assign" to make the changes.

2. Make sure that "Store Selected Items Only" is not activated.

   This option is for saving partial key commands settings only (see below).

3. Click the Save button next to the Presets pop-up menu.

   A dialog opens, allowing you to type in a name for the preset.

4. Click OK to save the preset.

   Your saved key commands settings are now available on the Presets pop-up menu.

Saving partial key commands settings

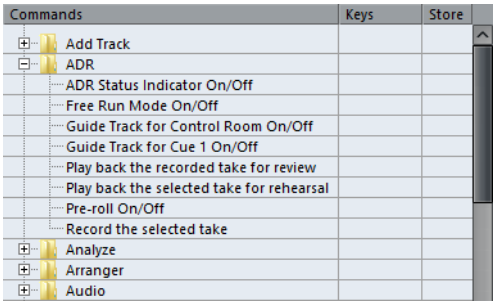
It is also possible to save partial key commands settings. This is useful for example if you have made settings that only relate to a specific project or settings that you wish to apply only in certain situations. When you apply a saved partial preset you only change the specific saved settings, while all other key commands settings will be left unchanged.

When you have set up the key commands and macros, proceed as follows to save the partial settings as a preset:

PROCEDURE

1. Activate the “Store Selected Items Only” option.

   When this is activated, a new “Store” column appears in the Commands list.



2. Click in the Store column for the key commands items you wish to save.

   Note that if you check an entire category folder (as opposed to separate commands) all commands it contains will automatically also be selected. If this is not what you want, deselect the commands you do not want to include.

3. Click the Save button (the disk icon) next to the Presets pop-up menu.

   A dialog opens, allowing you to type in a name for the Preset.

4. Click OK to save.

   Your saved key commands settings will now be available from the Preset pop-up menu for your future projects.

Loading key command presets

To load a key command preset, simply select it from the Presets pop-up menu.

NOTE

The key command settings you load will replace the current key command settings for the same functions (if any). If you have macros of the same name as those stored in the preset you load, these will be replaced too. If you want to be able to revert to your current settings again, make sure to save them first, as described above!

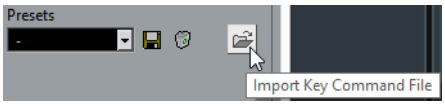
Loading earlier key commands settings

If you have saved key commands settings with an earlier program version, it is possible to use them in this Nuendo version, by using the “Import Key Command File” function, which lets you load and apply saved key commands.

PROCEDURE

1. Open the Key Commands dialog.
2. Click the “Import Key Command File” button to the right of the Presets pop-up menu.

   A standard file dialog opens.

3. In the file dialog, use the “Files of type” pop-up menu to specify if you want to import a key commands file (“.key”) or a macro commands file (extension “.mac”).

   When you have imported an older file, you might want to save it as a preset (see above) to be able to access it from the Presets pop-up menu in the future.

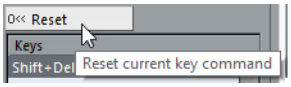
4. Navigate to the file you want to import and click “Open”.

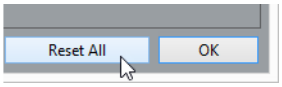
   The file is imported.

5. Click OK to exit the Key Commands dialog and apply the imported settings.

   The settings in the loaded key commands file or macros file now replace the current settings.

About the Reset and Reset All functions





These two buttons in the Key Commands dialog will both restore the default settings. The following rules apply:

- “Reset” will restore the default key command setting for the function selected in the Commands list.
- “Reset All” will restore the default key commands for all commands.

IMPORTANT

Note that the “Reset All” operation will cause any changes made to the default key commands to be lost! If you want to be able to revert to these settings again, make sure to save them first!

Using Alternative Key Sets

As an alternative to saving and loading key commands settings as previously described, you can set up and save “alternative key sets”. This allows you to switch between different key commands settings “on the fly” while you are working in the program, instead of having to go into the Key Commands dialog to change them.

About the preset Alternative Key Sets

By default, Nuendo contains two different key sets:

- “Markers” is actually not an alternative key set, but rather the default key set that you can switch back to at any time (see below).
- “Shuttle” is a specialized, alternative key set containing key commands settings for all of the Transport panel’s Shuttle controls.

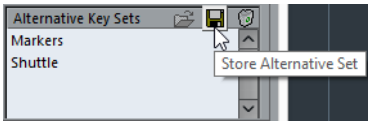
You can edit and save these under the same names to replace them with your own settings if you wish, but it is advised that you instead create additional key sets for your specific needs.

Saving an Alternative Key Set

PROCEDURE

1. Open the Key Commands dialog from the File menu.
2. Set up the key commands and macros the way you want them.
3. Decide whether you want to save complete or partial settings by activating/deactivating “Store Selected Items Only”.
4. Click the Store Alternative Set button (the disk icon) in the Alternative Key Sets section.

   A dialog opens, allowing you to type in a name for the Preset.

5. Type in a name for the key set and click OK to save it.

   The saved key set appears in the list of alternative key sets.

Editing an Alternative Key Set

PROCEDURE

1. Select the key set in the list and click the “Open” button (the folder icon) in the Alternative Key Sets section.

   The key set is now activated, and the key commands settings are changed accordingly.

2. Make the desired changes.
3. Click the Store Alternative Set button (the disk icon) in the Alternative Key Sets section.

   The key set is saved with the updated settings.

Removing a saved Alternative Key Set

- To remove a saved key set, select it in the list and click the “Remove” button (the trash icon) in the Alternative Key Sets section.

  A dialog opens asking if you want to remove the key set or cancel the operation.

Switching between Alternative Key Sets

You switch between different key sets in the program by using the key command assigned to the function “Toggle Alternate Key Commands”, located in the File subfolder in the Key Commands dialog.

The default key command for this function is [Ctrl]/[Command]-[F5], but you can of course change this to any key command that suits you best.

- When you press the key command for the function, the name of the loaded key set is briefly shown on top of the Project window.
- Each time you press the key command, you switch to the next available alternative key set.

RELATED LINKS

Adding or modifying a key command on page 1169

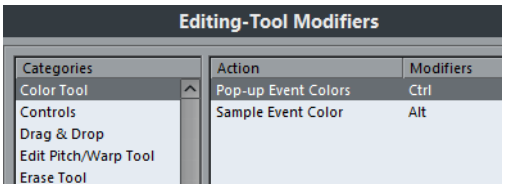
Setting up tool modifier keys

A tool modifier key is a key you can press to get an alternate function when using a tool. For example, clicking and dragging an event with the Object Selection tool normally moves it – holding down a modifier key (by default [Alt]/[Option]) while dragging will copy it instead.

The default assignments for tool modifier keys can be found in the Preferences dialog (Editing–Tool Modifiers page). Here, you can also edit them:

PROCEDURE

1. Open the Preferences dialog and select the Editing–Tool Modifiers page.



2. Select an option in the Categories list, and locate the action for which you want to edit the modifier key.

   For example, the “Copy” action mentioned above resides in the category “Drag & Drop”.

3. Select the action in the Action list.
4. Hold down the desired modifier key(s) and click the Assign button.

   The current modifier keys for the action are replaced. If the modifier keys you pressed are already assigned to another tool, you will be asked whether you want to overwrite them. If you do, this will leave the other tool without any modifier keys assigned.

5. When you are done, click OK to apply the changes and close the dialog.

The default key commands

Below, the default key commands are listed according to category.

NOTE

NEK only: When the Virtual Keyboard is displayed, the usual key commands are blocked because they are reserved for the Virtual Keyboard. The only exceptions are: [Ctrl]/[Command]-[S] (Save), Num [*] (Start/Stop Record), [Space] (Start/Stop Playback), Num [1] (Jump to left locator), [Delete] or [Backspace] (Delete), Num [/] (Cycle on/off), [F2] (Show/Hide Transport panel), and [Alt]/[Option]-[K] (Show/Hide Virtual Keyboard).

- Note that it is possible to switch key commands for menu items and other functions on and off.

Audio category

Option	Key command
Adjust Fades to Range	[A]
Auto-Grid	[Shift]-[Q]
Crossfade	[X]

Automation category

Option	Key command
Open Panel	[F6]
Redo Pass	[Ctrl]/[Command]-[Alt]/[Option]-[Shift]-[Z]
Read Automation for All Tracks On/Off	[Alt]/[Option]-[R]
Write Automation for All Tracks On/Off	[Alt]/[Option]-[W]
Undo Pass	[Ctrl]/[Command]-[Alt]/[Option]-[Z]

Chords

Option	Key command
Chord Pads	[Ctrl]/[Command]-[Shift]-[C]

Devices category

Option	Key command
MixConsole	[F3]
Video	[F8]
Virtual Keyboard (NEK only)	[Alt]/[Option]-[K]
VST Connections	[F4]
VST Instruments	[F11]
VST Performance	[F12]

Edit category

Option	Key command
Activate/Deactivate Focused Object	[Alt]/[Option]-A
Auto-Scroll On/Off	[F]
Copy	[Ctrl]/[Command]-[C]
Cut	[Ctrl]/[Command]-[X]
Cut Time	[Ctrl]/[Command]-[Shift]-[X]
Delete	[Delete] or [Backspace]
Delete Time	[Shift]-[Backspace]
Duplicate	[Ctrl]/[Command]-[D]
Edit In-Place	[Ctrl]/[Command]-[Shift]-[I]
Expand/Reduce	[Alt]/[Option]-[E]
Find Track/Channel	[Ctrl]/[Command]-[F]

Option	Key command
Group	[Ctrl]/[Command]-[G]
Insert Silence	[Ctrl]/[Command]-[Shift]-[E]
Invert	[Alt]/[Option]-F
Left Selection Side to Cursor	[E]
Lock	[Ctrl]/[Command]-[Shift]-[L]
Move to Cursor	[Ctrl]/[Command]-[L]
Move to Front (Uncover)	[U]
Mute	[M]
Mute Events	[Shift]-[M]
Mute/Unmute Objects	[Alt]/[Option]-[M]
Open Default Editor	[Ctrl]/[Command]-[E]
Open Score Editor (NEK only)	[Ctrl]/[Command]-[R]
Open/Close Editor	[Return]
Paste	[Ctrl]/[Command]-[V]
Paste at Origin	[Alt]/[Option]-[V]
Paste Relative to Cursor	[Shift]-[V]
Paste Time	[Ctrl]/[Command]-[Shift]-[V]
Primary Parameter: Decrease	[Ctrl]/[Command]-[Shift]-[Down Arrow]
Primary Parameter: Increase	[Ctrl]/[Command]-[Shift]-[Up Arrow]
Record Enable	[R]
Redo	[Ctrl]/[Command]-[Shift]-[Z]
Repeat	[Ctrl]/[Command]-[K]
Right Selection Side to Cursor	[D]
Secondary Parameter: Decrease	[Ctrl]/[Command]-[Shift]-[Left Arrow]
Secondary Parameter: Increase	[Ctrl]/[Command]-[Shift]-[Right Arrow]
Select All	[Ctrl]/[Command]-[A]
Select None	[Ctrl]/[Command]-[Shift]-[A]
Snap On/Off	[J]
Solo	[S]
Split At Cursor	[Alt]/[Option]-[X]
Split Range	[Shift]-[X]
Undo	[Ctrl]/[Command]-[Z]
Ungroup	[Ctrl]/[Command]-[U]
Unlock	[Ctrl]/[Command]-[Shift]-[U]
Unmute Events	[Shift]-[U]
Write	[W]

Editors category

Option	Key command
Show/Hide Editors	[Ctrl]/[Command]-[Alt]/[Option]-[E]
Show/Hide Info Line	[Ctrl]/[Command]-[I]
Show/Hide Inspector	[Alt]/[Option]-[I]
Show/Hide Overview	[Alt]/[Option]-[O]
Show/Hide Rack	[Alt]/[Option]-[T]
Toggle Rack Tabs	[Ctrl]/[Command]-[Alt]/[Option]-[T]

File category

Option	Key command
Close	[Ctrl]/[Command]-[W]
New	[Ctrl]/[Command]-[N]
Open	[Ctrl]/[Command]-[O]
Quit	[Ctrl]/[Command]-[Q]
Save	[Ctrl]/[Command]-[S]
Save As	[Ctrl]/[Command]-[Shift]-[S]
Save New Version	[Ctrl]/[Command]-[Alt]/[Option]-[S]
Toggle Alternate Key Commands	[#] or [Ctrl]/[Command]-[F5]

Inspector

Option	Key command
Toggle Inspector Footer Tabs	[Ctrl]/[Command]-[Alt]/[Option]-[Shift]-[T]
Toggle Inspector Tabs	[Ctrl]/[Command]-[Shift]-[T]

Media category

Option	Key command
Open MediaBay	[F5]
Preview Cycle On/Off	[Shift]-Num [/]
Preview Start	[Shift]-[Enter]
Preview Stop	[Shift]-Num [0]
Search MediaBay	[Shift]-[F5]
Toggle Attribute Inspector	[Ctrl]/[Command]-[Alt]/[Option]-Num [6]
Toggle Filters	[Ctrl]/[Command]-[Alt]/[Option]-Num [5]

Option	Key command
Toggle Location Tree	[Ctrl]/[Command]-[Alt]/[Option]-Num [4]
Toggle Locations	[Ctrl]/[Command]-[Alt]/[Option]-Num [8]
Toggle Previewer	[Ctrl]/[Command]-[Alt]/[Option]-Num [2]

MIDI category

Option	Key command
Show/Hide Controller Lanes	[Alt]/[Option]-[L]

Navigate category

Option	Key command
Add Down: Expand/Undo selection in the Project window to the bottom/ Move selected event in the Key Editor down 1 octave	[Shift]-[Down Arrow]
Add Left: Expand/Undo selection in the Project window/Key Editor to the left	[Shift]-[Left Arrow]
Add Right: Expand/Undo selection in the Project window/Key Editor to the right	[Shift]-[Right Arrow]
Add Up: Expand/Undo selection in the Project window to the top/Move selected event in the Key Editor up one octave	[Shift]-[Up Arrow]
Bottom: Select bottom track in the track list	[End]
Down: Select next in the Project window/Move selected event in the Key Editor one semitone down	[Down Arrow]
Left: Select next in the Project window/Key Editor	[Left Arrow]
Right: Select next in the Project window/Key Editor	[Right Arrow]
Top: Select top track in the track list	[Home]
Toggle Selection	[Ctrl]/[Command]-[Space]

Option	Key command
Up: Select next in the Project window/ Move selected event in the Key Editor one semitone up	[Up Arrow]

Nudge category

Option	Key command
End Left	[Alt]/[Option]-[Shift]-[Left Arrow]
End Right	[Alt]/[Option]-[Shift]-[Right Arrow]
Left	[Ctrl]/[Command]-[Right Arrow]
Right	[Ctrl]/[Command]-[Right Arrow]
Start Left	[Alt]/[Option]-[Left Arrow]
Start Right	[Alt]/[Option]-[Right Arrow]

Project category

Option	Key command
Open Browser	[Ctrl]/[Command]-[B]
Open Markers	[Ctrl]/[Command]-[M]
Open Pool	[Ctrl]/[Command]-[P]
Open Tempo Track	[Ctrl]/[Command]-[T]
Remove Selected Tracks	[Shift]-[Delete]
Setup	[Shift]-[S]

Quantize category

Option	Key command
Quantize	[Q]

Tool category

Option	Key command
Draw tool	[8]
Drumstick tool (NEK only)	[0]
Erase tool	[5]
Glue tool	[4]
Mute tool	[7]

Option	Key command
Next Tool	[F10]
Play tool	[9]
Previous Tool	[F9]
Range tool	[2]
Object Selection tool	[1]
Split tool	[3]
Zoom tool	[6]

TrackVersions category

Option	Key command
Duplicate Version	[Ctrl]/[Command]-[Shift]-[D]
New Version	[Ctrl]/[Command]-[Shift]-[N]
Next Version	[Ctrl]/[Command]-[Shift]-[H]
Previous Version	[Ctrl]/[Command]-[Shift]-[G]

Transport category

Option	Key command
Auto Punch In	[I]
Auto Punch Out	[O]
Cycle	[÷] (Win)/[/] (Mac)
Exchange Time Formats	[.]
Fast Forward	[Shift]-Num [+]
Fast Rewind	[Shift]-Num [-]
Forward	Num [+]
Input Left Locator	[Shift]-[L]
Input Position	[Shift]-[P]
Input Right Locator	[Shift]-[R]
Insert Marker	[Insert] (Win)
Locate Next Event	[N]
Locate Next Hitpoint	[Alt]/[Option]-[N]
Locate Next Marker	[Shift]-[N]
Locate Previous Event	[B]
Locate Previous Hitpoint	[Alt]/[Option]-[B]
Locate Previous Marker	[Shift]-[B]
Locate Selection	[L]

Option	Key command
Locators to Selection	[P]
Loop Selection	[Alt]/[Option]-[P]
Metronome On/Off	[C]
Nudge Cursor Left	[Ctrl]/[Command]-Num [-]
Nudge Cursor Right	[Ctrl]/[Command]-Num [+]
Panel (Transport panel)	[F2]
Play Selection Range	[Alt]/[Option]-[Space]
Recall Cycle Marker 1 to 9	[Shift]-Num [1] to Num [9]
Record	Num [*]
Retrospective Record	[Shift]-Num [*]
Return to Zero	Num [.] or Num [,] or Num [;]
Rewind	Num [-]
Set Left Locator	[Ctrl]/[Command]-Num [1]
Set Marker 1	[Ctrl]/[Command]-[1]
Set Marker 2	[Ctrl]/[Command]-[2]
Set Marker 3 to 9	[Ctrl]/[Command]-Num [3] to [9] or [Ctrl]/[Command]- [3] to [9]
Set Right Locator	[Ctrl]/[Command]-Num [2]
Start	[Enter]
Start/Stop	[Space]
Stop	Num [0]
To Left Locator	Num [1]
To Marker 1	[Shift]-[1]
To Marker 2	[Shift]-[2]
To Marker 3 to 9	Num [3] to [9] or [Shift]-[3] to [9]
To Right Locator	Num [2]
Use External Sync	[T]

Windows category

Option	Key command
Inline: Key Commands	[Shift]-[F4]
Inline: Settings	[Shift]-[F3]
Inline: View Layout	[Shift]-[F2]

Workspaces category

Option	Key command
New	[Ctrl]/[Command]-Num [0]
Reset	[Alt]/[Option]-Num [0]
Update Workspace	[Alt]/[Option]-U
Workspace 1-9	[Alt]/[Option]-Num [1-9]
Workspace X	[Ctrl]/[Command]-[Alt]/[Option]-Num [0]

Zoom category

Option	Key command
Zoom Full	[Shift]-[F]
Zoom In	[H]
Zoom In Tracks	[Ctrl]/[Command]-[Down Arrow]
Zoom In Vertically	[Shift]-[H]
Zoom Out	[G]
Zoom Out Tracks	[Ctrl]/[Command]-[Up Arrow]
Zoom Out Vertically	[Shift]-[G]
Zoom to Event	[Shift]-[E]
Zoom to Selection	[Alt]/[Option]-[S]
Zoom Tracks Exclusive	[Ctrl]/[Command]-[Alt]/[Option]-[Down Arrow]

RELATED LINKS

Turning key commands off on page 1170

File handling

Importing audio

In Nuendo audio can be imported in a variety of different formats. For example, you can import tracks from audio CDs, or import audio files saved in different formats (compressed and uncompressed).

RELATED LINKS

Importing Media on page 588

Audio file import options

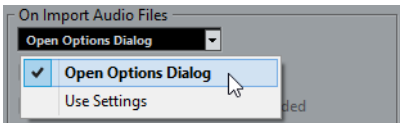
When you are importing audio files, there are a number of options concerning how the files should be treated by Nuendo:

- You can choose to copy the file into the Audio folder of the project and have the project make reference to the copied file rather than the original file.

  This helps you keep your project “self-contained”.

- You can choose to split stereo and multi-channel files into a number of mono files.
- You can set all files in the project to the same sample rate and sample size (resolution).

Using the “On Import Audio Files” pop-up menu in the Preferences dialog (Editing–Audio page), you can define what Nuendo does when importing an audio file. The available options are described in the following.



Open Options Dialog

An Options dialog appears when you import, allowing you to select whether you want to copy the files to the Audio folder and/or convert them to the project settings. Please note the following:

- When importing a single file of a format other than the project settings, you can specify which properties (sample rate and/or resolution) are changed.

- When importing multiple files at the same time, you can select to convert the imported files automatically if necessary, i.e. if the sample rate is different than the project's or the resolution is lower than the project setting.

NOTE

When you import 5-channel interleaved files that do not have the speaker arrangement metadata ("BEXT"), Nuendo always considers them as 5.0 format.

Use Settings

No Options dialog will appear when you import. Instead, you can select standard actions from the list below the pop-up menu that are performed automatically each time you import audio files:

Copy Files to Working Directory

If files are not already in the project's audio folder, they are copied there before being imported.

Convert and Copy to Project If Needed

If files are not already in the project's audio folder, they are copied there before being imported. Furthermore, if the files have a different sample rate or a lower resolution than the project settings, they are automatically converted.

Split channels/Split multi-channel files

Activate this option to split stereo or multi-channel audio files into a corresponding number of mono files – one for each channel. Note that if you use this option, the imported files are always copied to the Audio folder of the project's working directory.

If you import files using the Import option on the File menu, the split files are inserted into the project and into the Pool as separate mono tracks.

If you import the files using the Import Medium option on the Media menu, the split files are only inserted into the Pool.

In all cases, the "Split File Name Format" pop-up menu lets you specify how the split files are named. This allows for compatibility with other products when exchanging audio files and avoids confusion if the source file contains no stereo or surround material, but poly-mono audio.

Importing audio CD tracks

You can import audio from audio CDs into Nuendo projects in two ways:

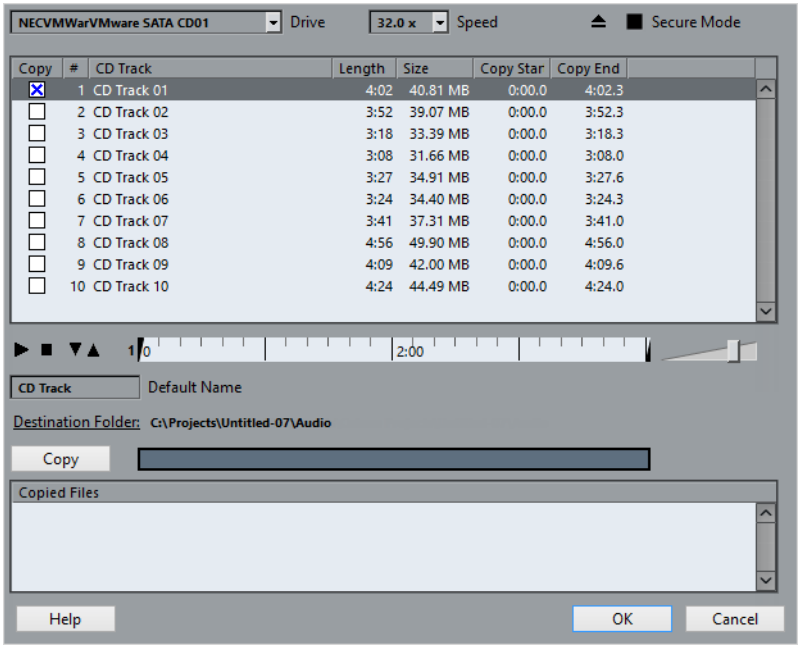
- To import the CD tracks directly into project tracks, choose the "Audio CD…" option from the Import submenu of the File menu.

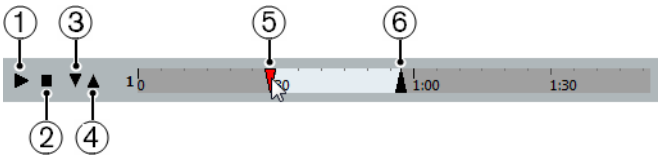
  The imported audio CD track(s) are inserted on the selected audio track(s) at the project cursor position.

- To import the CD tracks into the Pool, select “Import Audio CD…” from the Media menu.

  This might be the preferred method if you want to import several CD tracks in one go.

Selecting one of the Import Audio CD menu items brings up the following dialog:





1) Play
2) Stop
3) Play from Left Marker
4) Play to Right Marker
5) Start of selection handle
6) End of selection handle

To import one or more tracks, proceed as follows:

PROCEDURE

1. If you have more than one CD drive, select the correct one from the Drive pop-up menu at the top left.

   On opening the CD, the program tries to retrieve the track names from CDDB (a CD database). If no connection to CDDB can be established or the CD track names are not found, you can manually change the generic track name in the Default Name field.

2. Windows only: Activate the “Secure Mode” option if you want to use a Secure Read mode.

   Use this if you encounter problems when trying to import an audio CD. Error checking and correction will be done during the process. Note that this mode will take more time.

3. In the Windows version, select the data transfer speed from the Speed pop-up menu.

   While you normally want to use the fastest possible speed, you may have to select a slower speed for flawless audio extraction.

4. Activate the Copy checkbox for every audio file you want to import.

   You can also select a copy section for every file, see below.

5. Click on the Copy button to create a local copy of the audio file(s) or section(s).

   The copied files are listed at the bottom of the dialog. By default, imported audio CD tracks will be stored as Wave files (Windows) or AIFF files (Mac) in the Audio folder of the current project. To change the folder, click Destination Folder and select a different folder from the dialog. During copying, the Copy button is labeled “Stop”; click it to stop the process.

6. Click OK to import the copied audio files into the project, or click Cancel to stop the import and discard the copied files.

   If you import more than one audio file into project tracks, a dialog opens in which you have to choose whether to insert the tracks on one track or on different ones.

   The new track(s) are displayed in the Project window. New audio clips are created and added to the Pool.

   The columns in the “Import from Audio CD” dialog have the following functionality:

Column	Description
Copy	Activate the checkbox in this column for the track you want to copy/import. To activate more than one checkbox, click and drag over the checkboxes (or press [Ctrl]/[Command] or [Shift] and click).
#	This is the track number.
CD Track	When you import an audio CD track, the file is named according to this column. The names are pulled automatically from CDDB, if possible. You can rename a track by clicking in the CD Track column and typing a new name. You can also apply a generic name to all audio CD tracks, if no name was available in CDDB.
Length	The length of the audio CD track in minutes and seconds.
Size	The file size of the audio CD track in MB.
Copy Start	You can copy a section of a track if you like. This indicates the start of the section to be copied in the track. By default, this is set to the start of the track (0.000) but you can adjust this on the copy selection ruler, see below.
Copy End	Indicates the end of the section to be copied in the track. By default, this is set to the end of the track but you can adjust this on the copy selection ruler, see below.

By default, complete tracks are selected.

- If you want to copy and import a section of an audio CD track only, select the track in the list and specify the start and end of the selection to be copied by dragging the handles in the copy selection ruler.

NOTE

Note that you can import sections of several audio CD tracks by selecting them in turn and adjusting the selection. The start and end settings for each track are displayed in the list.

- You can audition the selected audio CD track by clicking the Play button.

  The track will be played back from selection start to selection end (or until you click the Stop button).
- The Play from left Marker (down arrow) and Play to Right Marker (up arrow) buttons allow you to audition the start and end of the selection only.

  The down arrow button will play a short snippet beginning at the start of the selection, while the up arrow button will play a snippet starting just before the end of the selection.
- To open the CD drive, click on the Eject button at the top of the dialog.

Importing Audio from video files

While you can automatically extract the audio when importing a video file, it is also possible to import the audio from a video file without importing the video itself:

PROCEDURE

1. Open the File menu, open the Import submenu and select “Audio from Video File…”.
2. In the file dialog that opens, locate and select the video file and click Open.

   The audio in the selected video file is extracted and converted to a Wave file in the project’s Audio folder.

   A new audio clip is created and added to the Pool. In the Project window, an event referencing the audio file is inserted on the selected track at the project cursor position. If no track was selected, a new track is created.

   This works just like importing regular audio files.

RELATED LINKS

Extracting Audio From a Video File on page 1111
Importing Video Files on page 1103

Importing ReCycle files

ReCycle by Propellerhead Software is a program designed especially for working with sampled loops. By “slicing” a loop and making separate samples of each beat, ReCycle makes it possible to match the tempo of a loop and edit the loop as if it was built of individual sounds. Nuendo can import two file types created by ReCycle:

- REX files (export file format of the first versions of ReCycle, extension “.rex”).
- REX 2 files (file format of ReCycle 2.0 and later, extension “.rx2”).

IMPORTANT

For this to work, the REX Shared Library needs to be installed on your system.

PROCEDURE

1. Select an audio track and move the project cursor to where you want the imported file to start.

   You probably want to import REX files to tempo based audio tracks, since this will allow you to change the tempo later on (having the imported REX file automatically adjust).

2. Select “Audio File…” from the Import submenu of the File menu.
3. On the file type pop-up menu in the file dialog, select REX File or REX 2 File.
4. Locate and select the file you want to import, and click Open.

   The file is imported and automatically adjusted to the current Nuendo tempo.

   Unlike a regular audio file, the imported REX file will consist of several events, one for each “slice” in the loop. The events will automatically be placed in an audio part on the selected track and positioned so that the original internal timing of the loop is preserved.

5. If you now open the part in the Audio Part Editor, you can edit each slice separately by muting, moving and resizing events, adding effects and processing, etc.

   You can also adjust the tempo and have the REX file automatically follow (provided that its track is tempo based).

   NOTE

   You can achieve similar results by using Nuendo’s own loop slicing features.

RELATED LINKS

Working with hitpoints and slices on page 533

Importing compressed audio files

Nuendo can import several common audio compression formats. The procedure is the same as when importing any non-compressed audio file, with one important thing to note:

For most compressed file formats, Nuendo creates a copy of the file and converts this to Wave format (Windows) or AIFF format (Mac OS X) before importing it. The original compressed file will not be used in the project.

The imported file is placed in the designated project Audio folder.

IMPORTANT

The resulting Wave/AIFF file is several times larger than the original compressed file.

The following file types are supported:

FLAC files

FLAC is an open source format and stands for Free Lossless Audio Codec. Audio files in this format are typically 50 to 60% smaller than regular Wave files. FLAC files are not converted to Wave files on import.

MPEG audio files

MPEG, which stands for Moving Picture Experts Group, is the name of a family of standards used for encoding audio-visual information (e.g. movies, video, music) in a digital compressed format.

Nuendo can read two types of audio MPEG files: MPEG Layer 2 (*.mp2) and MPEG Layer 3 (*.mp3). Currently, mp3 is the most common of these formats, while the mp2 format is mostly used in broadcast applications.

Ogg Vorbis files

Ogg Vorbis is an open and patent-free format that offers very small audio files maintaining comparatively high audio quality. Ogg Vorbis files have the extension ".ogg".

Windows Media Audio files (Windows only)

Windows Media Audio is an audio format developed by Microsoft, Inc. Due to advanced audio compression algorithms, Windows Media Audio files can be made very small, maintaining good audio quality. The files have the extension ".wma".

RELATED LINKS

Export Audio Mixdown on page 1018

Exporting and importing OMF files

Open Media Framework Interchange (OMFI) is a platform independent file format intended for the transfer of digital media between different applications. Nuendo can import and export OMF files (file extension ".omf"), allowing you to use Nuendo in conjunction with other audio and video applications.

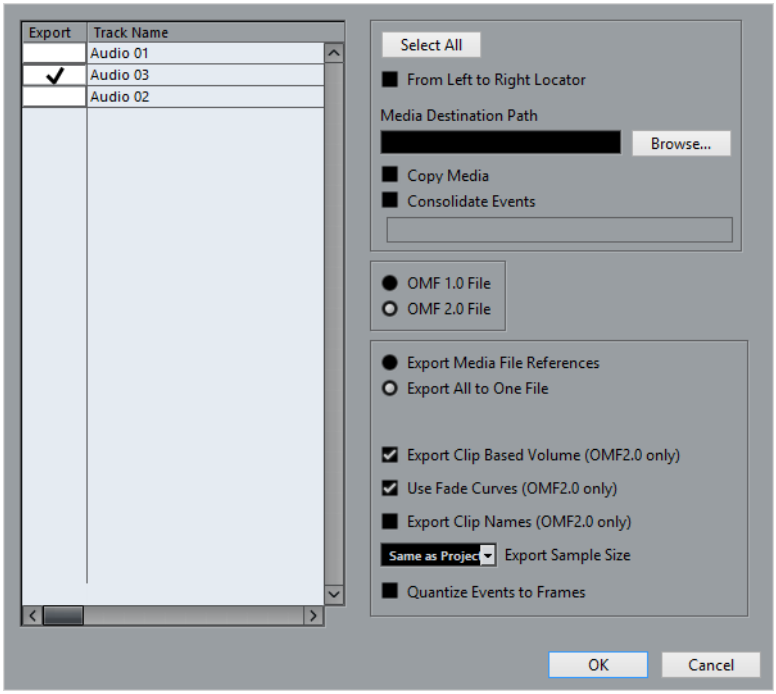
Exporting OMF files

When exporting tracks and files as OMF, you should consider setting up your project to use mono tracks and mono files, to allow compatibility with audio applications that provide limited support for interleaved audio files.

PROCEDURE

1. Open the File menu, open the Export submenu and select "OMF…".

   The Export Options dialog opens.



2. Use the track list to the left to select the tracks that you want to include in the exported file.

   To select all tracks, click the "Select All" button. Normally, the whole project is included – to export the range between the locators only, activate "From Left to Right Locator".

   When referencing media files (see below), you can set the referenced output path by entering it in the "Media Destination Path" field or by clicking on "Browser…" and choosing it in the file dialog that opens.

   All file references will be set to this path. You can create references to media destinations that do not exist on the system you are currently working with, making it easy to prepare files for use in projects on another system or in a network environment.

3. If you want to create copies of all the media files, choose the “Copy Media” option.

   By default, the copied audio files are placed in a subdirectory in the export destination folder. To specify a different location for the copied files, use the “Media Destination Path” field.

4. If you want to copy only the portions of audio files that are used in the project, activate “Consolidate Events”.

   You can also define handle lengths in milliseconds to include audio outside each event boundary for later fine tuning. If you do not have any handles when consolidating audio files, you will not be able to adjust fades or edit points when the project is imported in another application.

5. Select “1.0 File” or “2.0 File”, depending on which OMF version is supported by the application in which you plan to import the file.

   Select whether you want to include all audio data in the OMF file (“Export All to One File”) or use references only (“Export Media File References”).

   If you choose “Export All to One File”, the OMF file will be totally “self-contained”, but possibly very large. If you choose “Export Media File References”, the file will be small, but the referenced audio files must be available for the receiving application.

6. If you selected the “2.0 File” option above, you can choose whether to include the volume settings and fades for the events (as set up with the event volume and fade handles) as well as the clip names – to include these in the OMF file, activate “Export Clip Based Volume”, “Use Fade Curves” and/or “Export Clip Names”.

7. Specify a sample size (resolution) for the exported files (or use the current project settings).

8. If you activate “Quantize Events to Frames”, the event positions in the exported file will be moved to exact frames.

9. Click OK, and specify a name and location in the file dialog that opens.

   The exported OMF file will contain (or reference) all audio files that are played in the project (including fade and edit files). It will not include unused audio files referenced in the Pool, or any MIDI data. Video files are not included.

RELATED LINKS

Converting audio tracks (multi-channel to mono and vice versa) on page 1212

Importing OMF files

PROCEDURE

1. Open the File menu, open the Import submenu and select “OMF…”.

2. In the file dialog that opens, locate the OMF file and click Open.

   If there is already an open project, a dialog opens in which you can select whether a new project is created for the file.

   If you select “No”, the OMF file will be imported into the current project.

3. If you choose to create a new project, a file dialog opens in which you can select the project folder.

   Select an existing project folder or create a new one.

4. The Import Options dialog opens, allowing you to choose a track for the import.

   - Activating the “Import all media files” option allows you to import media that is not referenced by events.
   - Activating the “Import Clip Gain as Automation” option imports volume automation and envelopes of the Volume Automation Track of each track.
   - “Import at Timecode Position” will insert the elements contained in the OMF file at their original timecode positions.

     This is useful when you want to position every imported element at its exact timecode position, i.e. as it was saved in the OMF file. This way, the elements will end up at their correct time positions even when Nuendo uses a different frame rate than the OMF file. This is usually required in a picture-related context.
   - “Import at Absolute Time” will insert the elements contained in the OMF file starting at the timecode position saved in the file and keeping the relative distances between the elements.

     This is required when the relative positioning of the elements inside the OMF file needs to be maintained after importing it into the Nuendo timeline (even if Nuendo is set to a different frame rate than the OMF file). This is usually required in music contexts, where the timing between objects has highest priority.
   - If the OMF file contains video event information, you are asked whether you want to create Markers at the start position of the video events.

     This allows you to manually import the video files, using the Markers as position references.

   A new, untitled project is created (or tracks are added to the existing project), containing the audio events of the imported OMF file.

Exporting and importing AAF files

The Advanced Authoring Format (AAF) is a multimedia file format used to exchange digital media and meta data between different systems and applications across multiple platforms. Designed by the top media software companies, this format will help media creators by allowing them to exchange projects between applications without losing valuable meta data such as fades, automation, and processing information.

Exporting AAF files

PROCEDURE

1. Select “AAF…” from the Export submenu of the File menu.
2. You can choose which tracks will be exported from your project by clicking in the export column for each track name in the list.

   A checkmark will appear next to each track that will be exported. You may also click the “Select All” button to select all tracks in the project for export.
3. If you wish to only export the portion of the project that is between the left and right locators, activate the “From Left to Right Locator” checkbox.

   If an event crosses over the left or right locator, it will be trimmed in the AAF file to the point of the locator. Only the portions of events that lie within the boundaries of the locators will be included in the exported file.
4. If you want to create copies of all the media files, choose the “Copy Media” option.

   By default, the copied audio files are placed in a subdirectory in the export destination folder. To specify a different location for the copied files, use the “Media Destination Path” field.
5. If you want to copy only the portions of audio files that are used in the project, activate “Consolidate Events”.

   You can also define handle lengths in milliseconds to include audio outside each event boundary for later fine tuning. If you do not have any handles when consolidating audio files, you will not be able to adjust fades or edit points when the project is imported in another application.

   NOTE

   Even when selecting neither of the above two options, you can still enter a media destination path. All file references will be set to this path. You can create references to media destinations that do not exist on the system you are currently working with, making it easy to prepare files for use in projects on another system or in a network environment.
6. In the Options section, you have the choice of exporting all data to one file or to create media references to files from within the AAF file.

   Exporting only one file makes transfers simpler, but, at the time of writing of this manual, certain applications cannot handle single AAF files. Check with each software manufacturer for up-to-date information regarding AAF support in other applications.
7. You can specify the Sample Size by using the pop-up menu.
8. You can quantize events to frame boundaries by activating the “Quantize Events to Frames” option.

   Quantizing events to frame boundaries is sometimes necessary when exporting projects to video workstations that limit the accuracy of edits to the frame. Any events that do not begin or end on a frame boundary can exhibit odd behavior or be moved when imported into such a workstation.

Importing AAF files

PROCEDURE

1. Select “AAF…” from the Import submenu of the File menu, and select the AAF file that you want to import.
2. In the dialog that opens, select whether you want to create a new project for the imported files.
3. Select a directory or create one for the new project, and click OK.
4. In the dialog that opens, select the tracks you wish to import by clicking in the Import column next to each track.

   You can also click the Select All button to import all tracks in the AAF file.

   Optional: Activating **Import all Media Files** allows you to import media that are not referenced by events.
5. Select one of the following options:
   - **Import at Absolute Position**

     Places the AAF file at its original timecode position in your project. If the start time of the imported AAF file is outside of your project range, the start/end time of your project is modified.
   - **Import at Relative Position**

     Places the AAF file relatively to the start time of your project. For example, if your project starts at timecode 02:00:00:00, and the imported AAF was saved with a start time of 01:00:00:00, the AAF is placed at timecode 03:00:00:00 in your project.
   - **Import at Cursor Position**

     Places the AAF file at the cursor position.
6. Click OK.

   The import process begins. Depending on the size of the imported project and whether the files are embedded or referenced, the import process may take a while.

   IMPORTANT

   If you import AAF files in embedded format, the corresponding media files are played back from the embedded AAF archive, but not copied into the project folder. If you need to consolidate the media files, use the Prepare Archive function in the Media menu.

Importing MXF files

Nuendo supports audio files in the MXF (Material Exchange Format) container format (OP1a for import only, and OP-Atom). Project data from non-linear video editing systems is often delivered as AAF (Advanced Authoring Format) files referencing MXF audio. On importing AAF files, MXF media from the AAF project is automatically added as audio events to the project. However, you can also import individual MXF media (clips) independently from an AAF file.

Particularly in broadcast workflows, MXF is often used to manage multi-track projects including video. To import MXF media, proceed as follows:

PROCEDURE

1. Select “MXF…” from the Import submenu of the File menu, and select the MXF file that you want to import.
2. In the dialog that opens, select whether you want to create a new project for the imported files.
3. Select a directory or create one for the new project, and click OK.

   For multi-channel audio a single multi-channel track is created. Each audio track contained in the MXF file is imported on a separate audio track. The video track from the MXF file is ignored.

   NOTE

   As Nuendo projects reference media files inside an MXF file using relative paths, and changing the relative location of the MXF file and the Nuendo project file (.npr) leads to lost references, it might be useful to convert the MXF files to WAV. To consolidate the media files in the project folder, use the Convert Files function on the Media menu.

Exporting and importing AES31 files

The AES31 standard is an open file interchange format, developed by the Audio Engineering Society as a means of overcoming format incompatibility issues between different audio hardware and software. It can be used for transferring projects via disk or network from one workstation to another, retaining time positions of events, fades, etc.

AES31 uses the widely used Microsoft FAT32 file system with Broadcast Wave as the default audio file format. This means that an AES31 file can be transferred to and used with any digital audio workstation that supports AES31, regardless of the type of hardware and software used, as long as the workstation can read the FAT32 file system and Broadcast Wave files (or regular Wave files).

Exporting AES31 files

PROCEDURE

1. Select “AES31…” from the Export submenu of the File menu.
2. In the Export Options dialog, select the tracks that you want to export and click OK.
3. Specify a name and location for the file and click Save.

   The exported file will contain all Audio Track data, including audio file references. If any of the audio events in your project has realtime fades (as set up with the fade handles for the events), these will automatically be converted to fade audio files and stored in a fades folder next to the AES31 file.

   The following will not be included in the resulting AES file:

- Any Mixer settings or automation made in Nuendo.
- MIDI Tracks.

The saved file will be an XML file (but with the extension ".adl", for audio decision list) – this means you can open it in any text editor to check file references, etc.

Importing AES31 files

PROCEDURE

1. Select "AES31…" from the Import submenu of the File menu.
2. Navigate to the location of the AES31 file (extension ".adl"), select it and click Open.

   You are prompted to select or create a project folder for the new project.
3. After specifying the name and location of the project folder, the new project opens containing all the audio tracks and events stored in the AES31 file.
4. Do one of the following:
   - If you click No, the Import Options dialog opens. In this dialog, select which tracks you want to import and click OK.
   - If you click Yes, the Set Project Folder dialog opens. In this dialog, specify the name and location of the project folder and click OK. Then the Import Options dialog opens. In this dialog, select which tracks you want to import and click OK.

Exporting and importing OpenTL files

OpenTL is a file exchange format originally developed for Tascam hard disk recording systems. OpenTL facilities also exist in a variety of DAWs, making Nuendo project transfer reliable and solid. For example, a common use of OpenTL is to convert hassle free between Nuendo and Pro Tools. If you import or export an OpenTL file to/from Nuendo, the resulting project will contain all audio files, edits, and track names made in the Tascam device or DAW, with all events positioned sample accurately on the timeline.

OpenTL implementation in Tascam® MMR-8, MMP-16 and MX-2424

All three Tascam devices work with either two types of disk volume formats: FAT32 (Windows standard) or HFS+ (Mac OS standard). For proper Nuendo compatibility it is necessary that each and every MMR-8/MMP-16 be running OS v5.03 and MX-2424 v3.12. A number of crucial OpenTL updates only appear in these machine operating systems, and only this setup can assure reliable Nuendo exchange.

Audio file formats are volume type dependent: for FAT32 this is BWF (*.wav) and for HFS+ this is SDII. OpenTL files can only be transferred within file systems of the same format which means that it is not possible to import an OpenTL project exported from Mac (HFS+) into a Windows system (FAT32) or vice versa, unless you use a conversion utility (e.g. MM-EDL).

Nuendo for Windows supports OpenTL FAT32/BWF. Nuendo for Mac OS X supports OpenTL HFS+/SDII as well as FAT32/BWF. MMR-8, MMP-16, and MX-2424 support OpenTL projects sourcing or targeting Nuendo PC with up to 999 mono tracks.

Exporting OpenTL files

First, make sure all audio files (in the Pool) and tracks (in the Project window) in the project are in mono (split stereo tracks and stereo interleaved audio files to dual mono) and all 16-bit or all 24-bit. The OpenTL specification does not include support for 32-bit audio files. If the Pool contains 32-bit audio files, these will not be exported. Make sure all referenced audio files are located on the drive to which you want to export the OpenTL file.

IMPORTANT

When exporting OpenTL files on PC, do not change the DF or NDF frame notation after you have set the project start time. Make sure that all audio files in the Pool have the same sample rate, bit depth, and that all are set to Broadcast Wave file type.

PROCEDURE

1. Select “OpenTL…” from the Export submenu of the File menu.

   In the dialog that opens, activate the “Copy Media” or the “Consolidate Events” option to guarantee that all audio is exported. Locate the target hotswap FAT32 disk, select the appropriate project folder and click Open.

2. Select a name and location for the new file and click Save.

   The exported file will contain all audio track data, including file references, clip based volume automation, fade-in, fade-out, and crossfades.

RESULT

Now you can mount the carrier in the Tascam device and load the project.

The following will not be included in the resulting OpenTL EDL file:

- Any realtime mixing, EQ, effects settings, breakpoint automation tracks
- MIDI tracks made in Nuendo

The following is a basic OpenTL specification description:

- Maximum number of mono tracks: 999

- Supported sample rates (Hz): 44056, 44100, 44144, 47952, 48000, 48048, 42294, 42336, 45938, 45983, 46034, 46080, 50000, 50050, 88200, 96000
- Bit depth: 16, 24
- Audio file types: BWF (Broadcast Wave format), WAVE (Standard Wave), SDII (Sound Designer II, Mac only)
- Volume formats: FAT32, NTFS, HFS+
- Automation support: clip based volume, breakpoint volume and mute
- Fade support: fade in, fade out, and cross fade
- Frame rates (Fps): 24/24, 23.976/24, 24.975/25, 25/25, 29.97/DF, 29.97/NDF, 30/DF, 30/NDF

Importing OpenTL files

PROCEDURE

1. Select “OpenTL…” from the Import submenu of the File menu.
2. Navigate to the location of the OpenTL file, select it and click Open.
3. You are prompted to select or create a project folder for the new project.

   After specifying the name and location of the project folder, the new project opens containing all the audio files stored in the OpenTL file and their associated edits. Save the imported file as a Nuendo project.
4. Open the Pool, and select “Prepare Archive…” from the Pool context menu.

   This will copy any necessary external audio files into the local Nuendo project directory.
5. Select the Save option from the File menu.

RELATED LINKS

Preparing Archives on page 84

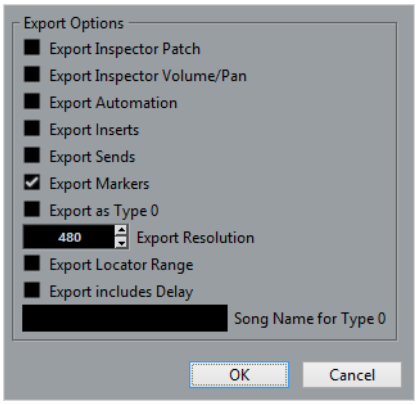
Exporting and importing standard MIDI files

Nuendo can import and export standard MIDI files, which makes it possible to transfer MIDI material to and from virtually any MIDI application on any platform. When you import and export MIDI files, you can also specify whether certain settings associated with the tracks are included in the files (automation tracks, volume and pan settings, etc.).

Exporting MIDI files

To export your MIDI tracks as a standard MIDI file, open the File menu and select "MIDI File…" from the Export submenu. A regular file dialog opens, allowing you to specify a location and name for the file.

When you have specified a location and a name for the file, click "Save". The Export Options dialog opens, allowing you to specify a number of options for the file, e.g. what is included in the file, its type and its resolution (see below for a description of the options).



You will also find most of these settings in the Preferences dialog (MIDI–MIDI File page). If you set these up in the Preferences dialog, you only need to click OK in the Export Options dialog to proceed.

The dialog contains the following options:

Option	Description
Export Inspector Patch	If this is activated, the MIDI patch settings in the Inspector – Bank Select and Program Select (used for selecting sounds in the connected MIDI instrument) are included as MIDI Bank Select and Program Change events in the MIDI file.
Export Inspector Volume/Pan	If this is activated, Volume and Pan settings made in the Inspector are included as MIDI Volume and Pan events in the MIDI file.
Export Automation	If this is activated, the automation data (as heard during playback) are converted to MIDI controller events and included in the MIDI file. This also includes automation recorded with the MIDI Control plug-in (see the separate PDF document "Plug-in Reference"). Note that if a continuous controller (e.g. CC7) has been recorded but the Read button is deactivated for the automation track (i.e. the automation is effectively switched off for this parameter), only the part data for this controller will be exported. If this option is deactivated and the Automation Read button is activated, no Continuous Controllers are exported. If the Read button is deactivated, the Controller data of the MIDI part are exported (these will now be handled like "regular" part data). In most cases it is recommended to activate this option.

Option	Description
Export Inserts	If this is activated and you are using MIDI modifiers or any MIDI plug-ins as insert effects, the modifications to the original MIDI notes that occur as a result of the effect(s) will be included in the MIDI file. A MIDI delay, for example, will produce a number of repeats to a MIDI note by actually adding additional, “echoing” notes at rhythmic intervals – these notes will be included in the MIDI file if the option is activated.
Export Sends	If this is activated and you are using any MIDI plug-ins as send effects, the modifications to the original MIDI notes that occur as a result of the effect(s) will be included in the MIDI file.
Export Markers	If this is activated, any markers you have added will be included in the MIDI file as standard MIDI file marker events.
Export as Type 0	If this is activated, the MIDI file will be of type 0 (all data on a single track, but on different MIDI channels). If you do not activate this option, the MIDI file will be of Type 1 (data on separate tracks). Which type to choose depends on what you want to do with the MIDI file (in which application or sequencer it should be used, etc.).
Export Resolution	You can specify a MIDI resolution between 24 and 960 for the MIDI file. The resolution is the number of pulses, or ticks, per quarter note (PPQ) and determines the precision with which you will be able to view and edit the MIDI data. The higher the resolution, the higher the precision. Choose the resolution depending on the application or sequencer with which the MIDI file will be used, though, since certain applications and sequencers may not be able to handle certain resolutions.
Export Locator Range	If this is activated, only the range between the locators will be exported.
Export includes Delay	If this is activated, the delay of the MIDI track will be included in the MIDI file.
Song name for Type 0	You can use this text field to change the name of the MIDI file as displayed when loading this file in a keyboard.

NOTE

The MIDI file will include the tempo information of the project (i.e. it will include the tempo and time signature events of the Tempo Track Editor or, if the tempo track is deactivated on the Transport panel, the current tempo and time signature).

NOTE

Inspector settings other than those specified in the Export options are not included in the MIDI file! To include these, you need to convert the settings to “real” MIDI events and properties by using the Merge MIDI in Loop function for each track.

RELATED LINKS

Automation on page 658
Markers on page 312
Basic track settings on page 736
Merge MIDI in Loop on page 766

Importing MIDI files

To import a MIDI file from disk, proceed as follows:

PROCEDURE

1. Select “MIDI File…” from the Import submenu of the File menu.
2. If there is already an open project, a dialog opens in which you can select whether a new project is created for the file.

   If you select “No”, the MIDI file will be imported into the current project.
3. Locate and select the MIDI file in the file dialog that opens and click Open.

   If you choose to create a new project, select the project folder.

   Select an existing project folder or create a new one.

RESULT

The MIDI file is imported. The result depends on the contents of the MIDI file and the Import Options settings in the Preferences dialog (MIDI–MIDI File page). The Import Options are as follows:

Option	Description
Extract First Patch	If this is activated, the first Program Change and Bank Select events for each track are converted to Inspector settings for the track.
Extract First Volume/Pan	If this is activated, the first MIDI Volume and Pan events for each track are converted to Inspector settings for the track.
Import Controller as Automation Tracks	If this is activated, MIDI controller events in the MIDI file will be converted to automation data for the MIDI tracks. If this is deactivated, controller data for the MIDI Parts will be imported.
Import to Left Locator	If this is activated, the imported MIDI file will be placed so that it starts at the position of the left locator – otherwise it will start at the beginning of the project. Note that if you choose to have a new project created automatically, the MIDI file will always start at the beginning of the project.
Import Markers	If this is activated, standard MIDI file markers in the file will be imported and converted to Nuendo markers.
Import dropped File as single Part	If this is activated and you drag and drop a MIDI file into the project, the whole file will be placed on a single track.
Ignore Master Track Events on Merge	If this is activated and you import a MIDI file into the current project, tempo and signature track data in the MIDI file are ignored. The imported MIDI file will play according to the current tempo and signature tracks in the project. If this option is deactivated, the Tempo Track Editor will be adjusted according to the tempo information in the MIDI file.

Option	Description
Auto Dissolve Format 0	If this is activated and you import a MIDI file of type 0 into the project, the file will automatically be “dissolved”: For each embedded MIDI channel in the file, a separate track will be inserted in the Project window. If this is deactivated, only one MIDI track will be created. This track will be set to MIDI Channel “Any”, allowing all MIDI events to play back on their original channels. You can also use the “Dissolve Part” function on the MIDI menu to distribute the events onto different tracks with different MIDI Channels at a later stage.
Destination	Here, you can specify what happens when you drag a MIDI file into the project: ▪ If you select the “MIDI Tracks” option, MIDI tracks are created for the imported file. ▪ If you select the “Instrument Tracks” option, instrument tracks are created for each MIDI channel in the MIDI file. Furthermore, the program automatically loads appropriate presets. ▪ If you select the “HALion Sonic SE multi-timbral” option, several MIDI tracks are created, each routed to a separate instance of HALion Sonic SE in the VST Instruments window and the appropriate presets are loaded.
Import Karaoke Lyrics as Text	Activate this to convert karaoke lyrics in the MIDI file to text that can be displayed in the Score Editor (NEK only). If this is deactivated, lyrics are only shown in the List Editor.

It is also possible to import a MIDI file from disk by dragging and dropping it from the Windows Explorer or the Mac OS Finder into the Project window. The Import Options apply as well.

RELATED LINKS

Markers on page 312

Support for the Yamaha XF data format

Nuendo supports the Yamaha XF format. XF is an extension of the standard MIDI file format that allows you to save song-specific data with a MIDI file of type 0.

When importing a MIDI file containing XF data, this data is placed in parts on separate tracks called “XF Data”, “Chord Data”, or “SysEx Data”. You can edit such a part in the List Editor (e.g. to add or change lyrics).

IMPORTANT

Do not change the order of events within the XF data or the event data itself, unless you have a lot of experience with XF data.

Nuendo can also export XF data as part of a MIDI file of type 0. If you do not want to export the XF data together with the MIDI data, mute or delete the tracks containing the XF data.

Exporting and importing MIDI loops

Nuendo allows you to import MIDI loops (file extension ".midiloop") and to save instrument parts as MIDI loops. MIDI loops are handy, as they contain not only MIDI notes and controllers, but also the number of voices, the associated VST instrument and instrument track preset settings.

RELATED LINKS

VST Instruments on page 690

Exporting and importing track archives

You can export Nuendo tracks (audio, FX, group, instrument, MIDI, and video) as track archives for import into other Nuendo projects. All the information associated with the tracks will be exported (channel settings, automation tracks, parts and events, etc.). If you select the "Copy" option (see below), a separate "media" folder will be created, containing copies of all referenced audio files.

NOTE

Project-specific settings (such as tempo) are not part of the exported track archives.

RELATED LINKS

Track Presets on page 167

Exporting tracks as track archives

PROCEDURE

1. Select the tracks you wish to export.
2. Open the File menu, open the Export submenu and choose "Selected Tracks…".
3. When exporting audio or video tracks, you are prompted to choose between two options:
   - Click Copy to include copies of the media files in the export.

     A file dialog opens in which you can choose an existing empty folder or create a new folder for saving the track archive (as XML file) and its media subfolder, which will contain any associated audio or video files. Click OK to save the track archive.
   - Click Reference to include merely a reference to the files in the export.

     A file dialog opens in which you can choose an existing folder for saving the track archive (as single XML file).
4. Enter a name for the track archive and click OK.

Importing Tracks from a Track Archive

You can import individual tracks from existing projects into your current project by means of track archives. The import options allow you to import tracks either as new tracks or as new TrackVersions of existing tracks.

Track archives are saved as XML files.

PROCEDURE

1. Select **File > Import > Track Archive**.
2. In the file dialog, select the XML file containing the required tracks and click **Open**.

   The **Import Options** dialog opens.
3. In the **Import** column, select the tracks that you want to import or click **Select All Tracks**.
4. In the **Destination** column, select one of the following options for each track that you want to import:
   - To import a track as a new track, select **New track**.
   - To import a track as a new TrackVersion of an existing track, select a track from the track list.
5. Optional: Activate **Copy to Active Project Folder**, if you want to import the media files into your project folder.
6. Optional: Activate **Perform Sample Rate Conversion**, if the sample rate of the imported media files is different from the sample rate of your project.
7. Click **OK**.

RESULT

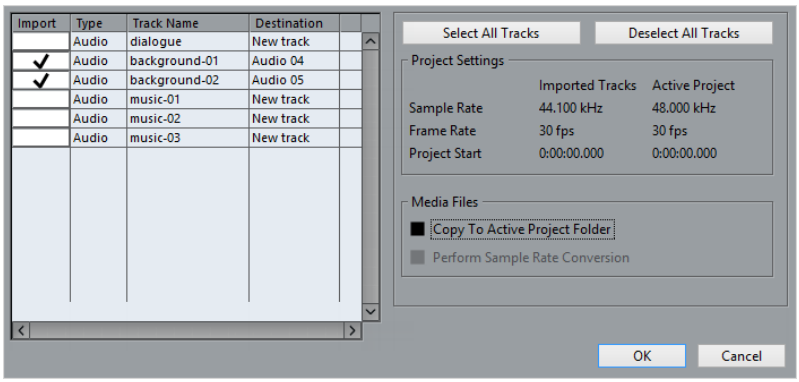
The tracks are imported into your active project.

RELATED LINKS

Track Archive Import Options on page 1208
TrackVersions on page 157

Track Archive Import Options

The **Import Options** dialog provides information about the tracks that are available for import, and offers several import options.



Import

Allows you to select the tracks that you want to import into your project.

Type

Shows the track types of the available tracks.

Track Name

Shows the track names of the available tracks.

Destination

Allows you to select if a track is imported into your active project as a new track, or as a new TrackVersion of an existing track.

- If a track is imported as a new track, this new track contains all audio events and mixer settings of the imported track. The following mixer settings are not imported: the channel visibility and zone settings, the record-enable status, the send destination, and the device panel settings. The routing settings are imported only if the active project contains the same routing sources and destinations as the imported track.
- If a track is imported as a new TrackVersion, this new track version contains all audio events of the imported track. The mixer settings of your active project are not changed.

NOTE

Imported track versions must be of the same type as the track in your active project.

To select a track as destination for the imported track, click on the corresponding list entry. A pop-up menu opens, allowing you to select the destination track, to browse through the folders of your active project, to expand or collapse the folder tree, and to search for track names.

Select All Tracks

Selects all tracks.

Deselect All Tracks

Deselects all tracks.

Project Settings

Shows the sample rate, the frame rate, and the project start time for both the imported tracks and your active project.

Copy to Active Project Folder

If this option is activated, the media files of the imported tracks are copied to your active project folder. If this option is deactivated, the media file path of the original project is referenced.

Perform Sample Rate Conversion

Imported tracks may contain media files with a sample rate that differs from the sample rate of your destination project. Files with a sample rate different from the one used in the destination project will play back at the wrong speed and pitch.

If this option is activated, the sample rate of the imported tracks is converted to the sample rate of your active project.

NOTE

This option is available only if the sample rates of the imported tracks and your active project differ and **Copy To Active Project Folder** is activated.

RELATED LINKS

TrackVersions on page 157

Importing Audio Tracks from a Project

You can import individual audio tracks from another Nuendo or Cubase project. The import options allow you to import tracks either as new tracks or as new TrackVersions of existing tracks.

PROCEDURE

1. Select **File > Import > Audio Tracks from Project**.
2. In the file dialog, select a project file and click **Open**.

   The **Import Options** dialog opens.
3. In the **Import** column, select the tracks that you want to import or click **Select All Tracks**.
4. In the **Destination** column, select one of the following options for each track that you want to import:
   - To import a track as a new track, select **New track**.
   - To import a track as a new TrackVersion of an existing track, select a track from the track list.
5. Optional: Activate **Copy to Active Project Folder**, if you want to import the media files into your project folder.

6. Optional: Activate **Perform Sample Rate Conversion**, if the sample rate of the imported media files is different from the sample rate of your project.
7. Click **OK**.

RESULT

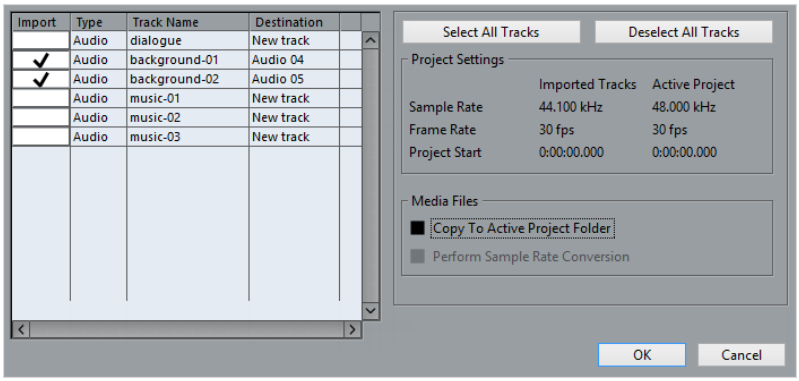
The audio tracks are imported in your active project.

RELATED LINKS

Audio Track from Project Import Options on page 1211
TrackVersions on page 157

Audio Track from Project Import Options

The **Import Options** dialog provides information about the tracks that are available for import, and offers several import options.



Import

Allows you to select the tracks that you want to import into your project.

Type

Shows the track types of the available tracks.

Track Name

Shows the track names of the available tracks.

Destination

Allows you to select if a track is imported into your active project as a new track, or as a new TrackVersion of an existing track.

- If a track is imported as a new track, this new track contains all audio events and mixer settings of the imported track. The following mixer settings are not imported: the channel visibility and zone settings, the record-enable status, the send destination, and the device panel settings. The routing settings are imported only if the active project contains the same routing sources and destinations as the imported track.

- If a track is imported as a new TrackVersion, this new track version contains all audio events of the imported track. The mixer settings of your active project are not changed.

To select a track as destination for the imported track, click on the corresponding list entry. A pop-up menu opens, allowing you to select the destination track, to browse through the folders of your active project, to expand or collapse the folder tree, and to search for track names.

Select All Tracks

Selects all tracks.

Deselect All Tracks

Deselects all tracks.

Project Settings

Shows the sample rate, the frame rate, and the project start time for both the imported tracks and your active project.

Copy to Active Project Folder

If this option is activated, the media files of the imported tracks are copied to your active project folder. If this option is deactivated, the media file path of the original project is referenced.

Perform Sample Rate Conversion

Imported tracks may contain media files with a sample rate that differs from the sample rate of your destination project. Files with a sample rate different from the one used in the destination project will play back at the wrong speed and pitch.

If this option is activated, the sample rate of the imported tracks is converted to the sample rate of your active project.

NOTE

This option is available only if the sample rates of the imported tracks and your active project differ and **Copy To Active Project Folder** is activated.

RELATED LINKS

TrackVersions on page 157

Converting audio tracks (multi-channel to mono and vice versa)

Splitting multi-channel tracks

When your project contains multi-channel tracks (e.g. stereo or surround tracks), you can split these into several mono tracks. This is useful in the following situations:

- When you want to export the tracks of your project for further processing in an application that only supports mono tracks.
- When you want to create a project from multi-channel tracks that are not stereo or surround (polyphonic mono).

  This format is often used for production sound, created by a field recorder, for example.
- When you want to edit individual channels of a multi-channel file.

  This allows you to access the individual channels from your remote control console.

The number of mono tracks that is created during this process depends on the number of channels comprised in the multi-channel file. The multi-channel audio material of the source track is split into mono events which are inserted on the new tracks. In the project's Audio folder, a subfolder called Split is created which contains the new mono files.

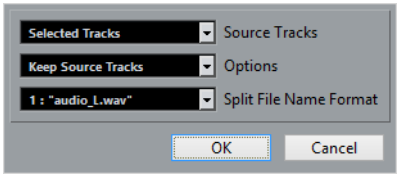
To split a multi-channel track, proceed as follows:

PROCEDURE

1. If you only want to split particular multi-channel tracks, select them in the Project window.

   If you want to split all multi-channel tracks of your project, you do not have to make a selection.
2. On the Project menu, open the Convert Tracks submenu and select "Multi-Channel to Mono…".

   A dialog opens.



3. On the Source Tracks pop-up menu, select whether you want to split all or only the selected multi-channel tracks.
4. On the Options pop-up menu, you can specify what happens when the multi-channel file is split.

   The following options are available:

Option	Description
Keep Source Tracks	New mono tracks are inserted below the source tracks.
Mute Source Tracks	As above, but the source tracks are muted.
Delete Source Tracks	New mono tracks are inserted and the source tracks are deleted.
Create New Project	A new project is created, containing only the resulting split tracks.

The option below allows you to decide how the created files will be named.

- Activate “Use Numbers For File Names” if you want the tracks and files to get the name of the source track, followed by a number.

  This is useful if you are working with source files that do not contain stereo or surround material, but polyphonic mono audio.

- Deactivate this if you want the file and track names to be followed by letters, denoting the corresponding speaker channels, e.g. “Audio 01_L” and “Audio 01_R”.

  This is useful if you are working with true multi-channel files. Note that if the source track was connected to an output bus with a matching channel configuration, the new mono tracks are automatically routed to the corresponding channels within this output bus.

5. Click OK.

   The track is split into the corresponding number of mono tracks.

   NOTE

   You can also split several multi-channel tracks simultaneously.

Notes

- The number of tracks created always corresponds to the channel configuration of the source track, even if the channel configurations of the source track and the source file do not match. For example if a 5.1 surround file is inserted on a stereo track, two new tracks containing the first two mono files are created. (However, in the project’s Audio folder, you will find six mono files, one for each channel in the original 5.1 file.) Likewise, if the source track configuration is 5.1, but contains a stereo file, six tracks are created, but only the first two contain files.

- All channel settings of the source tracks are copied to the tracks created by the split operation.

IMPORTANT

When a multi-channel source track contains a mono file and you perform a split, this mono file is copied onto the first two destination tracks. However, since panning information is not considered during the split, the volume of the new mono file may not correspond to that of the file on the original track.

Converting mono tracks into multi-channel tracks

Just as it is possible to split multi-channel tracks into separate mono tracks, you can convert mono tracks into multi-channel tracks.

This is useful in the following situations:

- When working with dual-mono tracks from other applications, e.g. Pro Tools.

  Converting these into interleaved tracks makes further editing and mixing more convenient.

- If you have recorded a stem of multi-mono surround tracks.

  Saving the recordings in one interleaved file allows you to assign this “stem” to one single channel in the Mixer (facilitating editing as well as giving you a better overview).

NOTE

- You cannot convert mono tracks containing audio parts. Only audio events are supported.
- You cannot convert tracks containing events in Musical Mode. Therefore, make sure that Musical Mode is not activated for any of the events.

The selected destination format and the order of the tracks in the track list determines which tracks are combined.

Requirements

- The number of source tracks and the destination format must match, i.e. the source tracks must “fit evenly” into a number of multi-channel files of the selected destination format.

  4 mono files can be converted into 2 stereo files or into one multi-channel file in LRCS format, for example. The tracks are combined according to their order in the track list (but they do not have to be adjacent). For stereo, the first two mono tracks (counted from the top) make up stereo track 1, the next two make up stereo track 2, and so on.

- The tracks which are combined have to reside on the same level in the track list, i.e. either on the top level or within the same folder track.
- The mono source tracks must match in terms of channel settings and automation, i.e. they must hold the same edits.

  The program tolerates minor discrepancies (you get a warning message and the settings of the topmost track of each group are used). However, when the channel settings differ considerably, the function cannot be applied. In this case, you should check whether you have selected the correct tracks.

- If the separate audio events have different volume envelopes, these are calculated into the new clip.

IMPORTANT

You should not raise the level of the source events over 0 dB, or clipping will occur in the created files. The only exception to this are files in 32-bit-float format (however, these are not supported by all applications).

NOTE

This function always combines the “raw” audio into new files. Therefore, the source tracks must have the same channel settings, otherwise the result would sound differently. To combine mono files with different channel settings, use the Audio Mixdown function instead.

RELATED LINKS

Export Audio Mixdown on page 1018

Performing the conversion

To convert several mono tracks into one or more multi-channel tracks, proceed as follows:

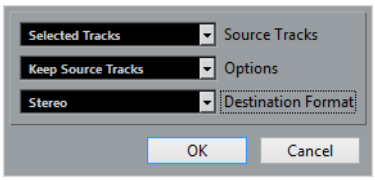
PROCEDURE

1. If you only want to convert particular mono tracks, select them in the Project window.

   If you want convert all mono tracks in your project, you do not have to select them.

2. On the Project menu, Convert Tracks submenu, select “Mono to Multi-Channel…”.

   A dialog opens.



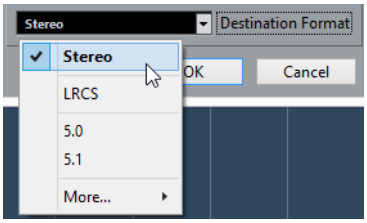
3. On the Source Tracks pop-up menu, specify whether you want to combine all mono tracks in your project or only the selected mono tracks.

4. On the Options pop-up menu, you can specify what happens when the files are combined.

   The following options are available:

5. On the Destination Format pop-up menu, select the format for the multi-channel file or files.

   Note that the number of selected tracks must match this format. If you have selected fourteen mono tracks, for example, you can select Stereo or one of the 7-channel surround formats. If the number of tracks and the destination format do not match, a warning message is displayed and the process is aborted.



6. Click OK.

   The corresponding number of multi-channel tracks is created. Events residing at the same position on the timeline are converted into a multi-channel event on the new track. If the lengths of the source events do not match exactly, the overlap will be included in the new events. In the project’s Audio folder, a subfolder called Merge is created which contains the new multi-channel files.

   NOTE

   If the outputs of the mono tracks are routed to separate channels within one output bus, this bus will be selected as output for the multi-channel track.

Clip packages

In postproduction it is common practice to create sounds by combining or “layering” several different sound components (e.g. for explosions, background atmospheres, or effect sounds). Usually, these sound combinations are being reused at a later stage. This might be in the same project (e.g. for recurring situations within one movie), or a different project (such as a later episode of a series or for a different production). When working with these sound combinations, the audio engineers need to be able to modify the separate sound components, in order to make adjustments due to last minute changes in the setup, for example.

Using clip packages

In Nuendo, you can create the above-mentioned “sounds” by arranging, editing and grouping their components (i.e. audio events or parts) in the Project window. These groups can then be selected, moved and copied as one. However, groups are not reflected in the Pool or the MediaBay. Furthermore, they are restricted to a single project and cannot be exported for use in other projects (other than as audio mixdown).

To be able to manage all components making up a special sound in Nuendo, you can save them in “clip packages”. This has the following advantages:

- Clip packages for a project can be easily saved and loaded, e.g. in other projects.
- Clip packages can be archived for later use.
- Clip packages are an easy way to transfer all components of a special sound between users or computers.

Clip packages are container files that include all the selected audio material (as opposed to mere file references). Therefore, they can be used “as they are” without running the risk of using incomplete sounds due to missing files. However, this does not apply to sound content from VST Sound archives, see below.

Considerations

- Clip packages contain copies of the audio files. Any offline processes you applied to the audio are saved in the file and cannot be modified or undone later.
- Clip packages contain volume and pan automation of the audio, as well as any fades, crossfades and volume envelopes. Insert or send effects or EQ settings of the corresponding tracks are not included.
- Imported or exported clip packages are automatically added to the Pool.
- Clip packages contain only the portion of an audio clip that is actually used by an event. This section is extended by 2 seconds at the beginning and the end of the event so that you are still able to adjust the event borders.

NOTE

- Audio clips set to musical time base are always copied in entirety into the clip package.
- If a clip package contains audio material from VST Sound archives, this is not copied into the clip package. In this case, a reference to the original VST Sound archive is saved. For these clip packages to work in another project or studio, the referred VST Sound files need to be present on the system.

RELATED LINKS

Defining the Track Time Base on page 156

Creating (exporting) clip packages

When you have created the desired sound in the Project window, you can transform it into a clip package.

PROCEDURE

1. Select the audio that makes up the sound. You can either select audio events and parts or create a selection range.

   If you create a selection range which includes empty space before the audio, this is included in the file.

   If you want to include your automation data in the clip package, make sure to read-enable the corresponding track before exporting the clip package.

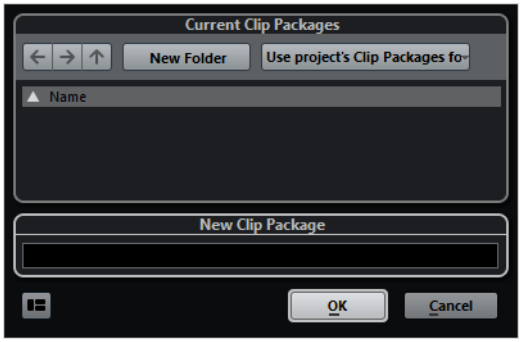
   NOTE

   Only audio material will be part of the clip package. If any other material is selected, this will be ignored.

2. On the File menu, open the Export submenu and select “Clip Package…”.

   You can set up a key command for this in the Key Commands dialog (File category).

   The Export Clip Package dialog opens.



3. In the upper section of the dialog, you specify the folder in which to save the clip package.
   - To save the clip package in the default folder (the “Clip Packages” folder within the Project folder), click on the button in the top right of the dialog to open a pop-up menu and select “Use Project’s Clip Packages Folder”.

- To save the clip package in another folder than the default folder, click on the button in the top right of the dialog to open a pop-up menu and select “Choose Folder…”.

  At the bottom of the menu, the last 5 locations are available.

4. In the Attributes Inspector section, you can specify certain attribute values for your clip package.

   To open the Attributes Inspector, click the button at the bottom left of the dialog.

   Click on an attribute value field to open a pop-up menu with the available values or double-click to enter an attribute value as text.
5. In the Name field at the bottom of the dialog, enter the name for your sound.
6. Click OK to save the clip package and close the dialog.

RELATED LINKS

Attribute Inspector on page 622

Previewing clip packages

Clip packages can be previewed in the MediaBay and in the Pool. For this purpose, a mixdown file is created together with the clip package. For the preview file, all events and tracks that are not part of the clip package are muted and all insert effects and EQs are bypassed. Please note that only the Main Mix output bus is used for the mixdown. The mixdown will be in the format set for the Main Mix bus.

In some cases what you hear during preview differs from what you hear when you load the actual clip package. This happens in the following situations:

- If you have included audio events or parts in the clip package that are located on tracks for which the effects have been “frozen”. These effects will be heard in the preview although they are not part of the clip package.
- If you have included tracks that are set to a different output than the Main Mix bus, these will not be heard in the mixdown although they are part of the clip package.
- If automation data for the Bypass Effect parameter has been recorded for tracks, this effect will be heard in the preview, although it is not part of the actual clip package.

RELATED LINKS

Freezing Insert Effects for a Track on page 449

Importing

Clip packages can be imported as follows:

- You can drag and drop clip packages from the Windows Explorer or Mac OS Finder, from the MediaBay or from the Pool into the Project window.
- You can double-click on a clip package in the MediaBay to insert it at the Project cursor.

- You can use the MediaBay context menu and select where to insert the clip package in the active project: at a specific timecode position, at the cursor, the left locator or at origin (the same position as in the original project).

  There is one thing to note: When importing a clip package that contains events from tracks set to musical time base, the musical positions (bars and beats) of the events and not the timecode positions are taken into account. This might not always be what you want (e.g. when working on projects with a different tempo).

- You can open the Import submenu of the File menu, and select “Clip Package…”.

  In the dialog that opens, select the clip package you want to import.

- You can select the clip package in the Pool, and select one of the “Insert into Project” options from the Media menu (or the Pool context menu) to insert the package at the corresponding position.
- You can also use the regular Copy and Paste commands to copy a clip package from the Windows Explorer/Mac OS Finder, the MediaBay, or the Pool into the Project window.
- You can add clip packages to the Pool (without inserting them into the project) using the regular import function.

RELATED LINKS

Importing Media on page 588

What happens on import?

When you import a clip package, the following happens:

- The corresponding audio parts and events are copied to the project folder.
- In the Project window, events are inserted that correspond to the original events. These events will be grouped.
- The first event is inserted on the selected track. If no track is selected, new tracks are added below the existing tracks and the events are inserted on these.

  The order of the tracks is the same as in the original project.

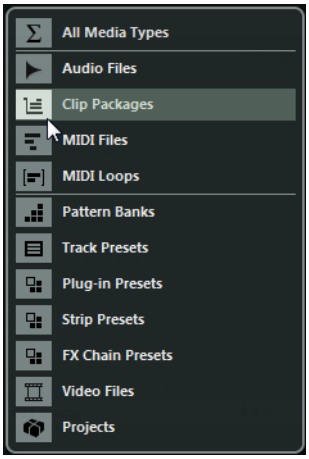
- If the sample rate of the audio files within the clip package does not correspond to the sample rate of the project into which it is inserted, the files are automatically converted to the project sample rate.
- If automation data for volume and pan was saved in the clip package, a corresponding automation curve is created together with the event.

  On import, you will be asked if you want to insert the automation, allowing you to decide whether you want to replace any existing automation data.

- Automation data for the SurroundPanner is only applied correctly on import when a target track with the correct surround format is selected.

Clip packages in the MediaBay

Clip packages can be managed like other media types in the MediaBay.



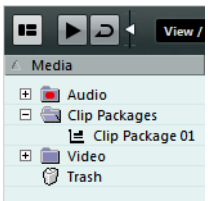
You can filter the MediaBay Results list to show only clip packages.

RELATED LINKS

MediaBay on page 598

Clip packages in the Pool

In the Pool, clip packages are available in a separate folder.



- The Pool functions “Prepare Archive”, “Export Pool”, “Import Pool”, and “New Library” will include any clip packages you created or imported.
- The Info column displays the length of the clip package and the text you entered for the “Content Summary” attribute (if any).

NOTE

Contrary to other file types, clip packages do not have a direct counterpart in the Project window. When you insert them into a project from within the Pool, the clip packages are separated into the audio events and parts they contain. Therefore, it is impossible to show the selected clip package in the Project window: simply because it does no longer exist as such.

RELATED LINKS

Pool on page 572

Customizing

Workspaces

Workspaces in Nuendo allow you to organize windows and specific dialogs for your common work routines.

A workspace saves the size, position, and layout or setting of important windows and dialogs, such as the **Project** window, **MixConsole**, or **Transport** panel. You can define several workspaces. This allows you to quickly switch between different working modes, either through the **Workspaces** menu or by using key commands.

You can define different workspace types that are either available for all projects on your computer or specific for one project. However, when you open a project, its last saved view is opened by default. A view is the window layout and setting that you defined for your project. The last saved view can either be a workspace view or a view that you saved without having any workspace selected. When you open an external project, the last used view on your computer is used by default.

The **Workspaces Organizer** and the **Workspaces** menu allow you to create and modify workspaces.

NOTE

- You can also work without workspaces. In this case, the last used view of the former project will be used when you create a new project.
- In the **Preferences** dialog on the **General** page, you can select which view is used when you open a project.

Workspace Types

You can create different workspace types.

Global workspace

Allows you to save a specific layout of dialogs and windows for all projects on your computer. Global workspaces are indicated by the letter G on your **Workspaces** menu.

Project workspace

Allows you to save a specific layout of dialogs and windows that is saved with your current project. This allows you to open your project layout on other computers. Project workspaces are indicated by the letter P on your **Workspaces** menu.

Workspace Templates

Nuendo provides sample templates that you can use as a starting point for your own workspaces.

The templates are made for screens with a resolution of 1280x800 px (minimal) or for screens with a resolution of 1920x1080 px (HD). You can change these templates according to your needs.

IMPORTANT

- Deleting and overwriting templates cannot be undone.
- If you have already used global workspaces in earlier Nuendo versions, the sample templates are not installed.

The following workspace templates are provided on the **Workspaces** menu:

Project (minimal)

Displays the **Project** window with minimal resolution.

Project + MixConsole (minimal)

Displays the **Project** window and **MixConsole** with minimal resolution.

Project (HD)

Displays the **Project** window with HD resolution.

Project + MixConsole + Channel Settings (HD)

Displays the **Project** window, **MixConsole**, and **Channel Settings** window with HD resolution.

NOTE

To see the **Channel Settings** window, you must select an audio, MIDI, instrument, FX channel, or group channel track before you select the template.

Project + MixConsole + Racks (HD)

Displays the **Project** window, **MixConsole**, and **Racks** with HD resolution.

Workspaces for External Projects

You can determine the view of external projects when you open them in Nuendo.

When you open external projects, which are projects that have been created on other computers, the window and dialog settings that you last used on your computer are applied by default. This can either be the last used view that was saved on your computer or one of your specified global workspaces.

If you want to open the original layout setting of a project, you have the following options:

- Select the project's original layout from the project workspaces on the **Workspaces** menu or in the **Workspace Organizer**.
- In the **Preferences** dialog on the **General** page, select **Never** from the **Open Projects in Last Used View** menu. This opens all external projects using their original layout. However, this may lead to a modification of your custom layout.

To return to the view that you last saved without any workspace assigned, select **No Workspace** on the **Workspaces** menu.

RELATED LINKS

Workspaces Organizer on page 1225
Open Projects in Last Used View on page 1264

Creating Workspaces

To save your current dialog and window setting for future use, you can create a new workspace.

PROCEDURE

1. Select **Workspaces > Add Workspace**.
   The **New Workspace** dialog opens.
2. In the **Name** field, enter a workspace name.
3. Select the type of workspace that you want to create.
   - **Global Workspace**
   - **Project Workspace**
4. Click **OK**.

RESULT

The workspace is saved and added to the **Workspaces** menu.

Editing Workspaces

You can modify your created workspaces.

NOTE

To change a global workspace to a project workspace and vice versa, you must save it as a different workspace type.

PROCEDURE

1. On the **Workspaces** menu, select the workspace that you want to modify.
2. Make your changes as required.
3. On the **Workspaces** menu, select one of the following:
   - To update your current workspace, click **Update Workspace**.
   - To save your workspace as a different workspace or workspace type, click **Add Workspace**.

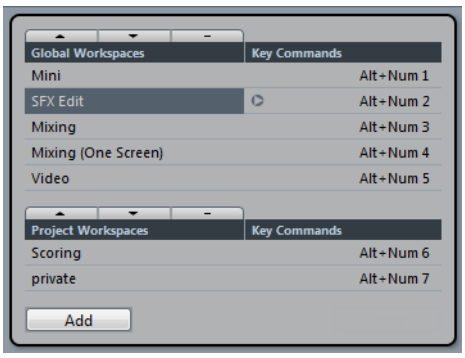
RELATED LINKS

Creating Workspaces on page 1224

Workspaces Organizer

The **Workspaces Organizer** allows you to manage the existing workspaces.

To open the **Workspaces Organizer**, click **Workspaces > Organize**.



The **Workspaces Organizer** displays the global workspaces and the project workspaces in separate lists. Every workspace has an assigned key command that lets you switch views quickly. Moving or deleting workspaces within the lists changes the key command assignments. When you change the position of a workspace, the key command assignments remain in their original list position. You can click a key command of a selected workspace to open the respective key command assignment in the **Workspace** category of the **Key Commands** dialog.

To organize your workspace, you have the following options:

Move Up

Moves up a workspace by one position.

Move Down

Moves down a workspace by one position.

Delete

Deletes a selected workspace.

Add

Allows you to create a new workspace using the **New Workspace** dialog.

NOTE

- You can also click and drag a workspace to another position within a list.
- You can move workspaces only within a list. For a global workspace to become a project workspace and vice versa, you must save it as a different type of workspace.
- To rename a workspace, you can double-click the workspace name.

RELATED LINKS

Workspaces category on page 1186

Using the Setup options

You can customize the appearance of the following elements:

- Transport panel
- Info line
- Toolbars
- Inspector

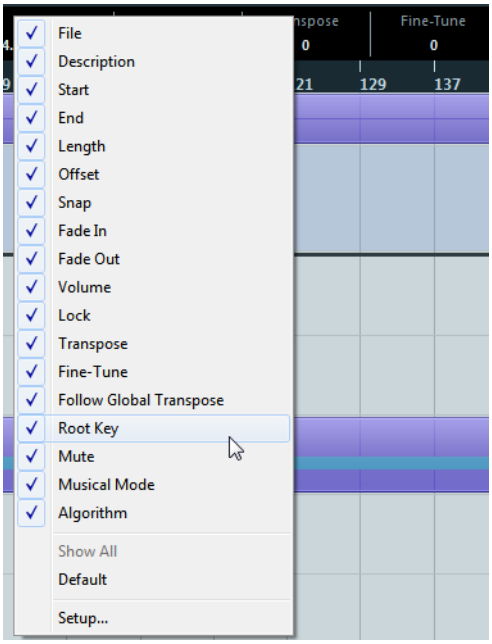
The setup context menus

If you right-click the Transport panel, the toolbars, the info lines, or the Inspector, the respective setup context menu opens.

The following general options are available on the setup context menus:

- “Show All” makes all items visible.
- “Default” resets the interface to the default setting.
- “Setup…” opens the Setup dialog, see below.

If presets are available, they can be selected on the lower half of the menu.



The info line setup context menu

The Setup dialogs

If you select “Setup…” from the setup context menus, the Setup dialog opens. This allows you to specify which elements are visible/hidden and to set the order of the elements. You can also save and recall setup presets in this dialog.

The dialog is divided into two sections. The left section displays the currently visible items and the right section displays the currently hidden items.

- You can change the current show/hide status by selecting items in one section and then use the arrow buttons in the middle of the dialog to move them to the other section.

  Changes are applied directly.

- By selecting items in the “Visible Items” list and using the Move Up and Move Down buttons, you can reorder the items list.

  Changes are applied directly. To undo all changes and revert to the standard layout, select “Default” on the setup context menu.

- If you click the Save button (disk icon) in the Presets section, a dialog opens, allowing you to name the current configuration and save it as a preset.

- To remove a preset, select it on the presets pop-up menu and click the trash icon.

- Saved configurations are available for selection from the Presets pop-up menu in the Setup dialog or directly from the setup context menu.

Configuring the main menu items

You can configure what items are shown on the main menus and submenus, and even hide entire menus. By customizing the menus you can hide items relating to program functions you never use, to customize the program according to your needs. For example, if you never use the Networking features in Nuendo, you can hide the entire Network menu from view.

IMPORTANT

Configuring the main menus is a feature intended for experienced Nuendo users. Do not hide menus or menu items unless you are sure that you do not need them!

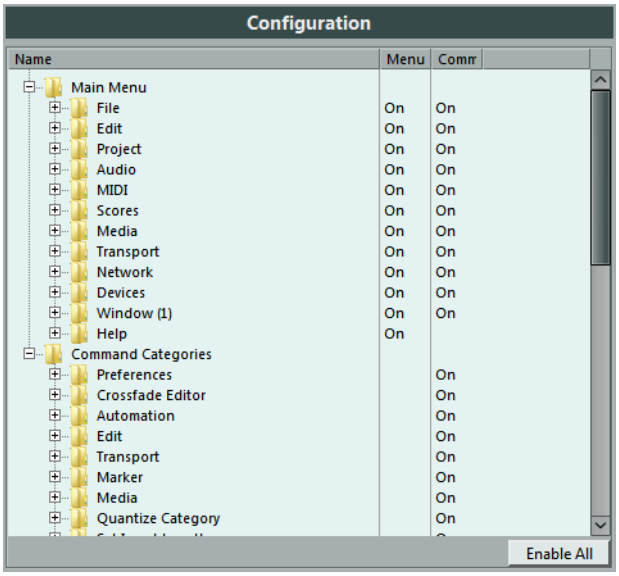
PROCEDURE

1. Open the Preferences dialog and select the Configuration page.

   The Configuration page contains two parent folders; “Main Menu”, which contains folders for all main menus, and “Command Categories” which contains folders for all Command categories. This section will only describe how to configure Main Menu items, not Command Categories.

2. Click on the “+” sign for a folder item, e.g. the File folder.

   As you can see, all commands and submenus on the File menu are listed in the Name column.



RESULT

- In the Menu column you can decide which File menu items to hide from view, by clicking in the column beside the corresponding menu item you wish to hide.

  If you click the “On” item in the Menu column for an item, it changes to “Off” and vice versa. All menu items set to “Off” will be hidden when you click Apply or OK.

- Certain essential menu items on the File and Edit menus cannot be hidden, such as Save, Open, Close, Undo/Redo, etc.

For these items there is no entry in the Menu column.

- If you set a main menu folder (as opposed to a menu item) to Off in the Menu column, the entire menu will be hidden from view.

  The exception to this is if the main menu folder contains non-removable menu items, in which case all hideable items on the menu will be set to Off, but the menu will still be visible.

- The Command column sets the key command On/Off status for the corresponding menu item.

  If this is set to Off, any assigned key command for the item will be disabled.

- You can save menu configurations as preference presets, either separately or together with other Preferences dialog settings.

- By using the above methods, you can customize all main menus to your liking.

  To apply the changes without exiting the dialog click “Apply”. Click OK to apply the changes and exit the dialog.

- To restore all menu items to their default setting (which is visibility and key commands on for all menus and menu items), click the Defaults button.

  Note that the Defaults button only restores the settings on the currently selected page (the Configuration page in this case) to their default settings. If you have changed settings on another page of the Preferences dialog, these are not reset.

RELATED LINKS

Turning key commands off on page 1170

Appearance

In the Preferences dialog, the appearance of Nuendo can be changed on the Appearance (Colors) and on the Metering (Appearance) page.

The following subpages are available on the Appearance–Colors page:

- **General**

  Allows you to adjust the default colors for the general interface of the program.

- **Track Type Defaults**

  Allows you to adjust the default colors for the different track types.

- **Project**

  Allows you to adjust the default colors in the Project window.

- **Editors**

  Allows you to adjust the default colors in the editors.

- **MixConsole Faders**

Allows you to adjust the default colors for the level faders of the channel types in the MixConsole.

- **MixConsole Racks**

  Allows you to adjust the default colors for the racks in the MixConsole.

- **MixConsole Channel Strip**

  Allows you to adjust the default colors for the channel strips in the MixConsole.

Appearance–Colors

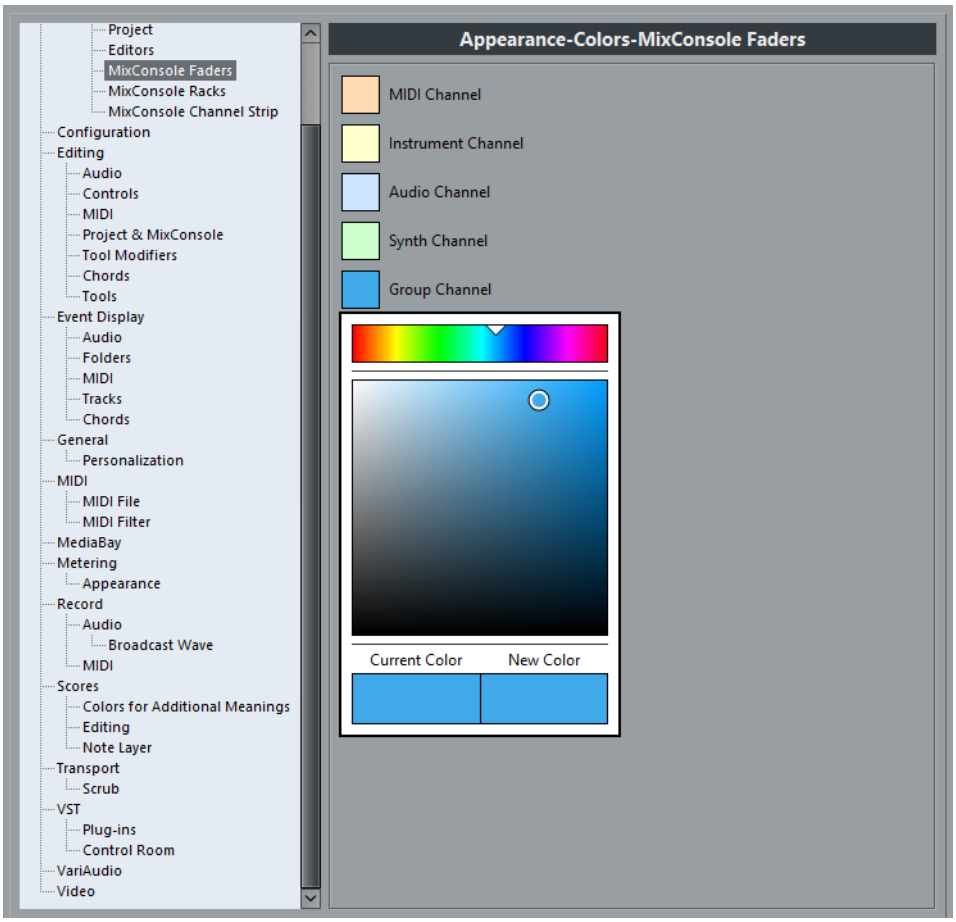
The Appearance–Colors page features several subpages that allow you to change the default color of the Nuendo desktop, the track types, the Project, Editor elements, and MixConsole elements.

To change a color, proceed as follows:

PROCEDURE

1. Select a subpage and click the color field of the element to which you want to assign a new color.

   A color selector pane opens.



2. Use the tools in the color selector pane to select a new color.

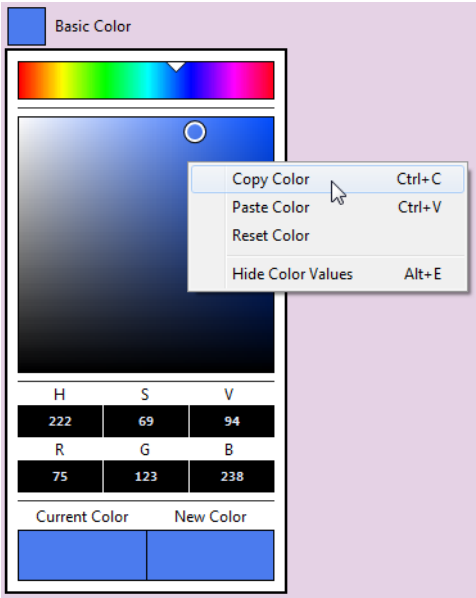
   The current and the new color are shown at the bottom of the pane.

3. Click outside the color selector pane to confirm your settings and apply your changes.

   Note that you must restart the application for some changes to take effect.

   - To copy a color and paste it on another element, even on another subpage, open the context menu in the color selector pane and select “Copy Color” and “Paste Color”.

     You can also copy colors on the same subpage using drag and drop.

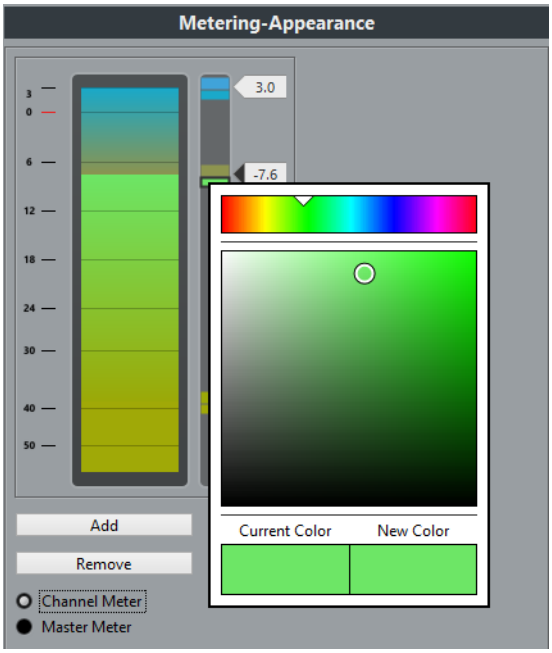
     

   - To edit the colors numerically, open the context menu in the color selector pane, and select “Show Color Values”.
   - To select any color in Nuendo as new color, open the color selector pane, hold down [Alt]/[Option], and click anywhere in the application.

     The selected color is displayed in the “New Color” field.

Metering–Appearance

Nuendo allows for precise color assignment of level meter values. On the Metering–Appearance page you can specify colors for quick identification of what levels are being reached.



You can adjust the colors for the Channel Meter or the Master Meter. For the Master Meter you can only make changes for the Digital Scale scaling mode. Changes take effect when you click Apply or OK.

To adjust the levels and colors, activate the Channel Meter or Master Meter option and proceed as follows:

- To specify the level for a color change, double-click a handle to the right of the meter scale and enter the level (dB) value.

  Note that for dB values less than zero, you must add a minus sign before the entered number.

  You can also click a handle and drag it to a specific level. Press [Shift] for more accurate positioning. Alternatively, you can nudge with the Arrow Up/Down keys. Press [Shift] for faster positioning.

- To assign a color, click the upper or lower part of a handle so that a black frame is shown, and use the color selector pane to select a color (see above).

  Selecting the same color for the upper and lower part of the handle results in a meter that changes its colors gradually, while separate colors indicate level changes even more precisely.

- To add more color handles, click the Add button, or [Alt]/[Option]-click at a level position to the right of the meter scale. Each new handle is automatically associated with a default color.

- To remove a handle, select the handle and click the Remove button, or [Ctrl]/[Command]-click the handle.

Applying colors in the Project window

You can use color scheming for an easier overview of tracks and events in the Project window. Colors can be applied individually to tracks and events/parts. If you color a track, the corresponding events and parts are displayed in the same color. However, you can also color events and parts differently, “overriding” the applied track color.

In the following sections you will learn how to set up preferences to color tracks automatically, how to color parts or events manually, how to determine whether you want to color the events themselves or their background, and how to customize the color palette for selecting colors.

Colorize Track Controls

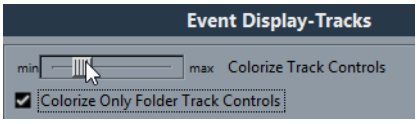
In the Preferences dialog (Event Display–Tracks page), you can find the “Colorize Track Controls” slider that allows you apply the track color to the track controls.

Colorize Folder Track Controls Only

You can restrict the effect of the **Colorize Track Control** function to folder tracks only. This is useful in projects with a large number of tracks and folder tracks.

PROCEDURE

1. Select **File > Preferences > Event Display > Tracks**.
2. Drag the **Colorize Track Controls** slider to the right.



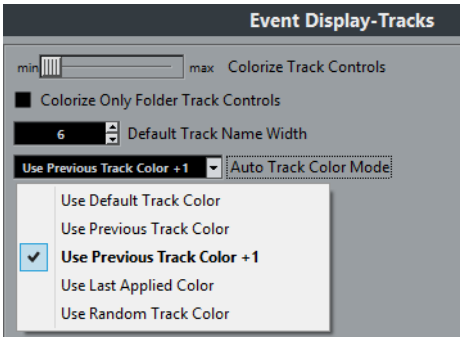
3. Activate **Colorize Only Folder Track Controls**.
4. Click **OK**.
5. In the track list, select the folder track that you want to colorize.
6. In the **Project** window toolbar, select the **Color Tool** and click again to select a color.

RESULT

Only the folder track controls are colorized.

Applying track colors automatically

In the Preferences dialog (Event Display–Tracks page), you can find the “Auto Track Color Mode” option.



This offers you several options for automatically assigning colors to tracks that are added to the project. The following options are available:

Use Default Track Color

The default color (gray) is assigned.

Use Previous Track Color

Analyzes the color of the selected track and uses the same color for the new track.

Use Previous Track Color +1

Analyzes the color of the selected track and uses the color that comes next in the color palette for the new track.

Use Last Applied Color

Uses the color that is selected in the Select Colors pop-up menu.

Use Random Track Color

Uses the color palette as a basis to assign track colors randomly.

Coloring Tracks, Parts, or Events Manually

The **Color** tool on the **Project** window toolbar allows you to color each track, part, or event individually.

PROCEDURE

1. In the **Project** window, do one of the following:
   - To change the color of an event or part, select it.
   - To change the color of a track, select the track and deselect all its events or parts.
2. On the toolbar, select the **Color** tool, click again, and select a color from the pop-up menu.

RESULT

The color is applied to the selected item. If you change the color of a track, the new color is used for all events on the track and for the corresponding channel in the **MixConsole**.

NOTE

If you assign a different color to individual parts or events, they no longer follow color changes of the track.

Resetting the Default Color

You can reset the color of a track, part, or event to the default color.

PROCEDURE

1. In the **Project** window, select the event or part that you want to reset to the default color.
2. On the toolbar, select the **Color** tool, click again, and select **Default Color** from the pop-up menu.

Project Colors Dialog

The **Project Colors** dialog allows you to set up a different set of colors for items in the **Project** window.

- To open the **Project Colors** dialog, select the **Color** tool in the **Project** window toolbar. Click again to open a pop-up menu and select **Project Colors**.

Color fields

Click a field to open a color selector pane that allows you to specify a new color.

Click **Options** for the following options.

Append New Color

Adds a new color button at the bottom of the color list.

Insert New Color before Selection

Adds a new color button above the selected color button.

Remove Selected Color

Removes the selected color.

Reset Selected Color

Resets the selected color to the factory settings.

Increase/Reduce Intensity of all Colors

Increases or reduces the intensity of all colors.

Increase/Reduce Brightness of all Colors

Increases or reduces the brightness of all colors.

Save Current Set as Program Defaults

Saves the current set of colors as default.

Load Program Defaults to Current Set

Applies the default set of colors.

Reset Current Set to Factory Settings

Returns to the standard color palette.

Adding and editing individual colors

In the Project Colors dialog, you can fully customize the color palette. To add new colors to the color palette, proceed as follows:

PROCEDURE

1. Add a new color by clicking the Insert New Color button.
2. In the Project Colors section, click the newly created color field to activate the new color for editing.
3. Use the Standard Colors or Modify Color sections to specify a new color.

   To do this, pick a different color from the color palette, drag the cursor in the color circle, move the handle in the color meter, or enter new RGB values as well as values for hue, saturation, and luminosity manually.
4. Click the Apply button.

   The color setting is applied to the selected color field in the Project Colors section.

   NOTE

   Every color in the Project Colors section can be edited this way.

Setting intensity and brightness

To increase or decrease the intensity and the brightness of all colors, use the corresponding buttons in the Project Colors section.

Increase/decrease intensity for all colors

Increase/decrease brightness for all colors

Where are the settings stored?

As you have seen, there are a large number of ways in which you can customize Nuendo. While some of the settings you make are stored with each project, others are stored in separate preference files.

If you need to transfer your projects to another computer (e.g. in another studio), you can bring all your settings along by copying the desired preference files and installing them on the other computer.

NOTE

It is a good idea to make a backup copy of your preference files once you have set things up the way you want! This way, if another Nuendo user wants to use his or her personal settings when working on your computer, you can restore your own preferences afterwards.

- On Windows systems, preference files are stored in the following location: “\Users\<user name>\AppData\Roaming\Steinberg\<program name>\”.

  On the Start menu, you will find a shortcut to this folder for easy access.

- On Mac OS X systems, preference files are stored in the following location: “/Library/Preferences/<program name>/” under your home directory.

  The full path is: “/Users/<user name>/Library/Preferences/<program name>/”.

NOTE

The RAMpresets.xml file, which contains various presets settings (see below), is saved when exiting the program.

NOTE

Program functions (e.g. crossfade) or configurations (e.g. panels) not used in the project will not be stored.

Some of the preferences are not stored in the default preferences folder. A list can be found in the Steinberg Knowledge Base.

To open the Knowledge Base, browse to the Steinberg web site, click “Support” and choose “Knowledge Base” in the list on the left.

Updating from a Previous Version of Nuendo

When you are updating from Nuendo 5 or higher, the customized settings of your previous installation are used for the new Nuendo version.

When your previous Nuendo version is older than Nuendo 5, its settings are discarded, and the default settings of the new version of Nuendo are used.

Disabling the Preferences

Sometimes you might experience odd program behaviour that can be due to inconsistent preferences settings. In such a case, you should save your project and relaunch Nuendo. You can disable or delete the current preferences settings, and load the factory defaults instead.

PROCEDURE

1. Quit Nuendo.
2. Launch Nuendo, and when the splash screen appears, hold down [Shift]-[Ctrl]/[Command]-[Alt]/[Option].
3. Select one of the following options in the dialog that appears:
   - **Use current program preferences**

     Opens the program with the current preference settings.
   - **Disable program preferences**

     Disables the current preferences, and opens the program with the factory default settings instead.
   - **Delete program preferences**

     Deletes the preferences and opens the program with the factory default settings instead. This process cannot be undone. Note that this affects all versions of Nuendo installed on your computer.

RELATED LINKS

Preferences on page 1246

Optimizing

Optimizing Audio Performance

This section gives you some hints and tips on how to get the most out of your Nuendo system, performance-wise. Some of this text refers to hardware properties and can be used as a guide when upgrading your system. Look for details and current information on the Nuendo web site.

Performance Aspects

Tracks and Effects

The faster your computer, the more tracks, effects, and EQ you are able to play. Exactly what constitutes a fast computer is almost a science in itself, but some hints are given below.

Short Response Times (Latency)

Another aspect of performance is response time. The term “latency” refers to the buffering, that is the temporary storing of small chunks of audio data during various steps of the recording and playback process on a computer. The more and larger those chunks, the higher the latency.

High latency is most irritating when playing VST instruments and when monitoring through the computer, that is when listening to a live audio source via the Nuendo MixConsole and effects. However, very long latency times (several hundred milliseconds) can also affect other processes like mixing, for example, when the effect of a fader movement is heard only after a noticeable delay.

While Direct Monitoring and other techniques reduce the problems associated with very long latency times, a system that responds fast will always be more convenient to work with.

- Depending on your audio hardware, it may be possible to trim your latency times, usually by lowering the size and the number of buffers.
- For details, refer to the audio hardware documentation.

System Factors That Affect Performance

RAM

The more RAM is installed in your computer, the better.

IMPORTANT

On computers running a Windows 32-bit operating system, a running application can address a maximum of 2 GB of RAM. On a Macintosh computer running 32-bit Mac OS X, this limit is 4 GB. The 64-bit versions of Windows and Mac OS X are able to assign considerably more than 4 GB of RAM to a running 64-bit application.

The RAM limitation is imposed by the operating system, and it is independent of the amount of RAM that you may have installed in your computer.

Some program functions may use all the available memory, for example, recording, the use of effect plug-ins, and the pre-loading of samples.

IMPORTANT

When a function has used up all the memory made available by the operating system, the computer will crash.

Always keep in mind the RAM limitation of your operating system when setting up your projects.

RELATED LINKS

RAM Requirements for Recording on page 247
Smart Plug-In Processing on page 440

CPU and Processor Cache

The faster the computer processor, the better. But there are a number of factors that affect the apparent speed of a computer: the bus speed and type (PCI is strongly recommended), the processor cache size and of course, the processor type and brand. Nuendo relies heavily on floating point calculations. When shopping for a processor, make sure that you get one that is powerful in calculating floating point arithmetics.

Nuendo features full support for multi-processor systems. If you own a computer system with more than one processor, Nuendo can take advantage of the total capacity and evenly distribute the processing load to all available processors.

RELATED LINKS

Multi Processing on page 1243

Hard Disk and Controller

The number of hard disk tracks that you can record and play back at the same time also depends on the speed of your hard disk and hard disk controller. If you use E-IDE disks and controllers, make sure that the transfer mode is DMA Busmaster. Under Windows, you can check the current mode by launching the Windows Device Manager and looking for properties of the IDE ATA/ATAPI controller's primary and secondary channel. DMA transfer mode is enabled by default, but may be turned off by the system in case of hardware problems.

Audio Hardware and Driver

The hardware and its driver can have some effect on regular performance. A badly written driver can reduce the performance of your computer. But where the hardware driver design makes the most difference is with latency.

NOTE

We recommend that you use audio hardware for which there is a specific ASIO driver.

This is especially true when using Nuendo for Windows:

- Under Windows, ASIO drivers written specifically for the hardware are more efficient than the Generic Low Latency ASIO Driver or a DirectX driver and produce shorter latency times.
- Under Mac OS X, audio hardware with properly written Mac OS X (Core Audio) drivers can be very efficient and produce very low latency times.

However, there are additional features currently only available with ASIO drivers, such as the ASIO Positioning Protocol.

Settings That Affect Performance

Audio Buffer Settings

Audio buffers affect how audio is sent to and from the audio hardware. The size of the audio buffers affects both the latency and the audio performance.

Generally, the smaller the buffer size, the lower the latency. On the other hand, working with small buffers can be demanding for the computer. If the audio buffers are too small, you may get clicks, pops or other audio playback problems.

- To adjust the buffer size settings under Mac OS X, select **Devices > Device Setup**, and select the **Device Setup** dialog. You may also find buffer settings in the control panel for the audio hardware.
- To adjust the buffer size settings under Windows, select **Devices > Device Setup**, select the driver page, and click **Control Panel**.

Multi Processing

When Multi Processing is activated and there is more than one CPU in your system, the processing load is distributed evenly to all available CPUs, allowing Nuendo to make full use of the combined power of the multiple processors.

- To activate Multi Processing, select **Devices > Device Setup**, select **VST Audio System**, and activate **Activate Multi Processing**.

VST Performance Window

This window shows the audio processing load and the hard disk transfer rate. This allows you to verify that you do not run into performance problems when adding effects or plug-ins, for example.

- To open the **VST Performance** window, select **Devices > VST Performance**.

Average load

Shows how much of the available CPU power is used for audio processing.

Real-time peak

Shows the processing load in the realtime path of the audio engine. The higher this value, the higher the risk that dropouts occur.

Overload indicator

The overload indicator to the right of the **real-time peak** indicator and the **average load** indicator displays overloads of the average or real-time indicator.

If it lights up, decrease the number of EQ modules, active effects, and audio channels that play back simultaneously. You can also activate the ASIO-Guard.

Disk

Shows the hard disk transfer load.

Disk overload indicator

The overload indicator to the right of the disk indicator lights up if the hard disk does not supply data fast enough.

If it lights up, use **Disable Track** to reduce the number of tracks playing back. If this does not help, you need a faster hard disk.

NOTE

You can show a simple view of the performance meter on the **Transport** panel and on the **Project** window toolbar. These meters only feature the average and the disk indicator.

ASIO-Guard

The ASIO-Guard allows you to shift as much processing as possible from the ASIO realtime path to the ASIO-Guard processing path. This results in a more stable system.

The ASIO-Guard allows you to preprocess all channels as well as VST instruments that do not need to be calculated in realtime. This leads to less dropouts, the ability to process more tracks or plug-ins, and the ability to use smaller buffer sizes.

ASIO-Guard Latency

High ASIO-Guard levels lead to an increased ASIO-Guard latency. When you adjust a volume fader, for example, you will hear the parameter changes with a slight delay. The ASIO-Guard latency, in contrast to the latency of the audio hardware, is independant from live input.

Restrictions

The ASIO-Guard cannot be used for:

- Realtime-dependent signals
- External effects and instruments
- Plug-ins that have a different bit version than the operating system

NOTE

If you select **Devices > Plug-in Manager** and click **Show Plug-in Information**, you can deactivate the ASIO-Guard option for selected plug-ins.

If you activate the monitoring for an input channel, a MIDI or a VST instrument channel, the audio channel and all dependent channels are automatically switched from ASIO-Guard to realtime processing and vice versa. This results in a gentle fade out and fade in of the audio channel.

Activating the ASIO-Guard

PROCEDURE

1. Select **Devices > Device Setup**.
2. In the **Device Setup** dialog, open the **VST Audio System** page.
3. Activate the **Activate ASIO-Guard** option.

NOTE

This option is only available, if you activate **Multi Processing**.

4. Select an **ASIO-Guard Level**.

   The higher the level, the higher the processing stability and audio processing performance. However, higher levels also lead to an increased ASIO-Guard latency and memory usage.

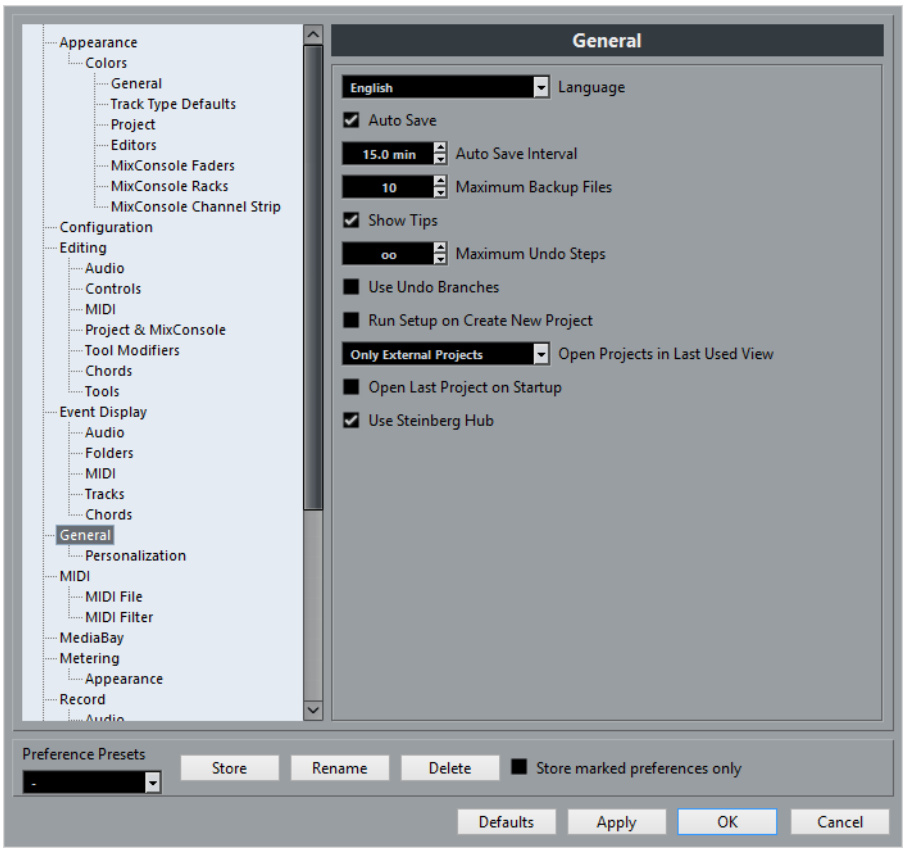
Preferences

The **Preferences** dialog provides options and settings that control the global behavior of the program.

Preferences Dialog

The Preferences dialog is divided into a navigation list and a settings page. Clicking one of the entries in the navigation list opens a settings page.

- To open the **Preferences** dialog, select **File > Preferences**.



In addition to the settings, the dialog provides the following options:

Preference Presets

Allows you to select a saved preference preset.

Store

Allows you to save the current preferences as a preset.

Rename

Allows you to rename a preset.

Delete

Allows you to delete a preset.

Store marked preferences only

Allows you to select which pages are included in the preset.

Help

Opens the dialog help.

Defaults

Resets the options on the active page to their default settings.

Apply

Applies any changes that you have made without closing the dialog.

OK

Applies any changes that you have made and close the dialog.

Cancel

Closes the dialog without saving any changes.

Saving a Preference Preset

You can save complete or partial preference settings as presets.

PROCEDURE

1. Select **File > Preferences**.
2. In the **Preferences** dialog make your settings.
3. Click the **Store** button in the lower left section of the dialog.
4. Enter a preset name and click **OK**.

RESULT

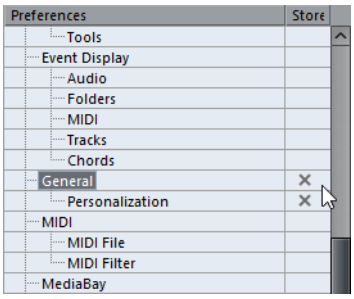
Your settings are now available on the **Preferences Presets** pop-up menu.

Saving Partial Preferences Settings

You can save partial preferences settings. This is useful when you have made settings that only relate to a certain project or situation, for example. When you apply a saved partial preference preset you only change the saved settings. All other preferences will be left unchanged.

PROCEDURE

1. Select **File > Preferences**.
2. In the **Preferences** dialog make your settings.
3. Activate **Store marked preferences only**.
   In the preferences list a **Store** column is shown.



4. Click in the **Store** column of the preference pages that you want to save.
5. Click **Store** in the lower left section of the dialog.
6. Enter a preset name and click **OK**.

RESULT

Your settings are now available from the **Preferences Presets** pop-up menu.

Appearance

Colors

This page features subpages that allow you to change the default color settings.

General

Allows you to adjust the default colors for the general interface of the program.

Track Type Defaults

Allows you to adjust the default colors for the different track types.

Project

Allows you to adjust the default colors in the **Project** window.

Editors

Allows you to adjust the default colors in the editors.

MixConsole Faders

Allows you to adjust the default colors for the level faders of the channel types in the **MixConsole**.

MixConsole Racks

Allows you to adjust the default colors for the racks in the **MixConsole**.

MixConsole Channel Strip

Allows you to adjust the default colors for the channel strips in the **MixConsole**.

Configuration

This section allows you to configure what items are shown on the main menus and submenus. You can also hide entire menus.

You can activate/deactivate key commands for menu items by changing the **On/Off** status in the **Command** column. Even if a key command is assigned to an item, it will be disabled if you set the key command status to **Off**.

- The **Configuration** page contains two parent folders: **Main Menu**, which contains subfolders with items found on all main menus, and **Command Categories**, which contains subfolders with items corresponding to program functions that are not available on the main menus.
- To hide a menu item or a menu, click in the **Menu** column beside it to change it to **Off**. Click again to change back to **On**.

  All menu items or menus set to **Off** will be hidden in the program when you click **Apply** or **OK**.

  NOTE

  Note that certain essential menu items cannot be hidden, such as **Save**, **Open**, **Close**, **Undo**/**Redo**, etc. This has the consequence that if you set a main menu folder that contains such items to **Off**, all hideable items on the menu will be set to **Off**, but the menu will still be visible.

- To disable the key commands for a menu item, menu or function, click in the **Command** column beside it so that the column reads **Off**. Click again to change back to **On**.

  For all items set to **Off** it will not be possible to use any assigned key commands when you click **Apply** or **OK**.

- By clicking the **Enable All** button, you can revert back to the default settings - all items set to **On**. Meaning all menu items are visible and all key commands enabled.

RELATED LINKS

Configuring the main menu items on page 1228

Editing

Display Warning before Deleting Non-Empty Tracks

If this option is activated, a warning message is displayed if you delete tracks that are not empty.

Default Track Time Type

This allows you to specify the default track time type for new tracks. When you change this setting, all new tracks will use the selected time type.

- **Musical**
  All added tracks are set to musical time type. The respective button shows a note symbol.
- **Time Linear**
  All new audio tracks use linear time base, that is the button shows a clock symbol.
- **Follow Transport Main Display**
  New tracks use the primary time format setting on the transport panel. When this is set to **Bars+Beats**, tracks with musical time base will be added. When this is set to any of the other options (**Seconds**, **Timecode**, **Samples**, etc.), all new tracks will use linear time base.

Select Track on Background Click

This allows you to select a track by clicking in the event display background.

Auto Select Events under Cursor

If this option is activated, all events in the **Project** window or in an editor that are currently touched by the project cursor are automatically selected. This can be helpful when you rearrange your project, because it allows you to select whole sections (on all tracks) simply by moving the project cursor.

Cycle Follows Range Selection

If this is activated, range selections that you make in the **Sample Editor** will be mirrored in the **Project** window as well. This lets you audition a range in the **Sample Editor** as a loop with the main transport controls, rather than with the **Audition** and **Audition Loop** controls in the **Sample Editor**.

Delete Overlaps

If this is activated and you move, size, or nudge an event so that it partly overlaps another event, the other event is automatically resized so that the overlapped (hidden) section is removed. Hold [Shift] while moving to override this setting.

Link Editors

When this is activated, the parts or events shown in the open editor windows will follow the selection that you make in the **Project** window.

Parts Get Track Names

If this is activated and you move an event from one track to another, the moved event will automatically be named according to its new track. Otherwise, the event will retain the name of the original track.

Lock Event Attributes

This setting determines which properties are affected when you lock an event (by selecting **Lock** from the **Edit** menu). You can select any combination of the following three options:

- **Position**
  If this is locked, the event cannot be moved.
- **Size**
  If this is locked, the event cannot be resized.
- **Other**
  If this is locked, all other editing of the event is disabled. This includes adjusting the fades and event volume, processing, etc.

Quick Zoom

If this option is activated, the contents of parts and events will not be continuously redrawn when you zoom manually. Instead, the contents are redrawn once you have stopped changing the zoom – activate this if screen redraws are slow on your system.

Use Up/Down Navigation Commands for Selecting Tracks only

- When this option is deactivated and no event/part is selected in the **Project** window, the up/down arrow keys on the computer keyboard are used to step through the tracks in the track list.
- When this option is deactivated and an event/part is selected in the **Project** window however, the up/down arrow keys still step through the tracks in the track list. Only on the currently selected track, the first event/part will also be selected.
- When this option is activated, the up/down arrow keys are only used to change the track selection – the current event/part selection in the **Project** window will not be altered.

Track Selection follows Event Selection

If this option is activated and you select an event in the **Project** window, the corresponding track is also automatically selected.

Automation follows Events

If you activate this option, automation events will automatically follow when you move an event or part on the track.

This facilitates setting up automation that is related to a specific event or part, instead of a specific position in the project. For example, you can automate the panning of a sound effect event (having the sound pan from left to right, etc.) – if you need to move the event, the automation will automatically follow. The rules are:

- All automation events for the track between the start and end of the event or part will be moved. If there are automation events in the position to which you move the part or event, these will be overwritten.
- If you duplicate an event or part (by holding [Alt]/[Option] and dragging or by using the **Duplicate** or **Repeat** functions) the automation events will also be duplicated as well.
- This function also affects copying and pasting.

Drag Delay

When you click and drag an event, this setting determines the delay before the event is moved. This helps you avoid accidentally moving events when you click on them in the **Project** window.

Editing - Audio

Treat Muted Audio Events like Deleted

If you have two overlapping audio events in your project and you mute the top one (the event you hear during playback), playback of the other (obscured) event will still only start at the end of the overlapping section.

If this is not what you want, **Treat Muted Audio Events like Deleted** allows you to immediately play the obscured event when muting the top event.

Use Mouse Wheel for Event Volume and Fades

- If this is activated, you can use the mouse wheel to move the event volume curve up or down.
- When you hold down [Shift] while moving the mouse wheel, the fade curves will be affected. To move the end point of the fade in, position the mouse in the left half of the event. To move the start point of the fade out, position the mouse in the right half of the event.

Simple Crossfade Editor

If this is activated, a simplified **Crossfade** dialog opens when you double-click a crossfade or select **Open Fade Editor(s)** from the **Audio** menu. The regular **Crossfade** dialog contains a host of additional, advanced functions for adjusting crossfades.

On Import Audio Files

This setting determines what happens when importing an audio file into a project:

- **Open Options Dialog**
  An Import Options dialog opens when you import, allowing you to select whether you want to copy the file to the audio folder and/or convert it to the project settings.
- **Use Settings**
  Allows you to set the following standard actions:
  Copy Files to Working Directory copies the files to the project's audio folder before import.
  Convert and Copy to Project If Needed copies the files to the project's audio folder before import and converts them if the files have a different sample rate or a lower resolution than the project settings.
  Split channels/Split multi-channel files copies the files to the project's audio folder and splits stereo or multi-channel audio files into a corresponding number of mono files – one for each channel. Use the **Split File Name Format** pop-up menu to specify how the split files are named. This allows for compatibility with other products when exchanging audio files and avoids confusion if the source file contains no stereo or surround material, but poly-mono audio.

Enable Automatic Hitpoint Detection

If this is activated, and you add an audio file to your project by recording or by importing, Nuendo automatically detects its hitpoints. This allows you to navigate to hitpoints of an audio file from within the **Project** window.

Remove Regions/Hitpoints on all Offline Processes

If this is activated, and you perform offline processing on an audio range that contains regions, these will be removed.

On Processing Shared Clips

This setting determines what happens when you apply processing to a shared clip, that is a clip that is used by more than one event in the project:

- **Open Options Dialog**
  An **Options** dialog appears, allowing you to select whether you want to create a new version of the clip or apply the processing to the existing clip.
- **Create New Version**
  A new editing version of the clip is automatically created, and the processing is applied to that version (leaving the original clip unaffected).
- **Process Existing Clip**
  The processing is applied to the existing clip (which means that all events playing that clip will be affected).

Default Warping Algorithm

Determines which warp algorithm is used for new audio clips in the project.

Time Stretch Tool Algorithm

Use this option to select a default algorithm that is applied when using the Object Selection tool in **Sizing Applies Time Stretch** mode. This mode allows you to resize parts and events in the **Project** window and apply time stretch to their contents in the process, so that the audio material is adjusted to fit the new length of the part or event. The following settings are available:

- **MPEX – Preview Quality**
  Use this mode only for preview purposes.
- **MPEX – Mix Fast**
  This mode is a very fast mode for preview. This works best with composite music signals (mono or stereo material).
- **MPEX – Solo Fast**
  Use this mode for single instruments (monophonic material) and voice.
- **MPEX – Solo Musical**
  Same as above but higher quality.
- **MPEX – Poly Fast**
  Use this for processing monophonic and polyphonic material. This is the fastest setting that still provides very good results. You can use this for drum loops, mixes, or chords.
- **MPEX – Poly Musical**
  Use this for processing monophonic and polyphonic material. This is the recommended MPEX default quality setting. You can use this for drum loops, mixes, or chords.
- **MPEX – Poly Complex**
  This high quality setting produces high CPU load. Use this setting when processing difficult material or for stretch factors above 1.3.
- **Realtime**
  This algorithm is much quicker and allows for better CPU performance than MPEX, but produces a lower sound quality.

Editing - Controls

Many Nuendo parameters are shown as rotary encoders, sliders, and buttons that emulate hardware interfaces. Others are edited numerically in value fields. This page allows you to select the preferred ways of controlling encoders, sliders, and value fields.

Value Box/Time Control Mode

The menu contains the following options:

- **Text Input on Left-Click**
  In this mode, clicking a value box will open it for editing by typing.

- **Increment/Decrement on Left/Right-Click**
  In this mode, you can click with the left or right mouse button to decrease or increase the value. To edit values by typing in this mode, please double-click. Under Mac OS X, right-clicking is the same as [Ctrl]/[Command]-clicking. We recommend that you use a two-button mouse and set up the right button to generate a [Ctrl]/[Command]-click.
- **Increment/Decrement on Left-Click and Drag**
  In this mode, you can click and drag up or down to adjust the value (much like dragging a vertical fader). Double-click to enter values manually.

Knob Mode

The menu contains the following options:

- **Circular**
  To move an encoder, click on it and drag in a circular motion, such as turning a real encoder. When you click anywhere along the encoder's edge, the setting is immediately changed.
- **Relative Circular**
  Works like the **Circular** option, but clicking does not automatically change the setting. This means you can make adjustments to the current setting by clicking anywhere on an encoder and dragging. There is no need to click on the exact current position.
- **Linear**
  To move an encoder, click on it and drag up or down (or left or right) with the mouse button pressed – as if the encoder was a vertical (or horizontal) slider.

Slider Mode

The menu contains the following options:

- **Jump**
  In this mode, clicking anywhere on a slider will make the slider handle instantly move to that position.
- **Touch**
  In this mode, you have to click on the actual slider handle to adjust the parameter. This reduces the risk of accidentally moving sliders.
- **Ramp**
  In this mode, clicking anywhere on a slider (but not on the actual handle) and keeping the mouse button pressed causes the handle to move smoothly to the new position.
- **Relative**
  In this mode, clicking on a slider will not immediately change the setting. Instead you click and drag up or down – the setting will be changed according to how far you drag, not according to where you click.

Editing - MIDI

Select Controllers in Note Range: Use Extended Note Context

When this is activated and you move notes together with their controllers, for example, in the Key Editor, the extended note context will be taken into account. This means that controllers between the last selected note and the following note (or the end of the part) will also be moved. When this is deactivated, only the controllers between the first and the last selected note will be moved.

Legato Overlap

Determines the result of the **Legato** function on the **MIDI** menu.

- If **Legato Overlap** is set to 0 Ticks, the **Legato** function extends each selected note so that it reaches the next note exactly.
- Setting **Legato Overlap** to a positive value causes the notes to overlap by the specified number of ticks.
- Setting **Legato Overlap** to a negative value makes the Legato function leave a slight gap between the notes.

Legato Mode: Between Selected Notes Only

When this is activated, the length of selected notes will be adjusted so that they reach the next selected note, allowing you to apply **Legato** only to your bass line, for example.

Split MIDI Events

If you split a MIDI part in the **Project** window (with the **Cut** tool or one of the split functions) so that the split position intersects one or several MIDI notes, the result depends on this setting.

- If **Split MIDI Events** is activated, the intersected notes are split. This creates new notes at the beginning of the second part.
- If **Split MIDI Events** is deactivated, the notes will remain in the first part, but stick out after the end of the part.

Split MIDI Controllers

If you split a MIDI part containing controllers, the result depends on this setting:

- If Split MIDI Controllers is activated and the part contains a controller with a value other than zero at the split position, a new controller event (of the same type and value) will be inserted at the split position (at the start of the second part).

- If Split MIDI Controllers is deactivated, no new controller events will be inserted.

NOTE

If you just split a part and play back the result, it will sound the same regardless of this setting. However, if you split a part and delete the first half or move the second half to a different position in the project, you may want to activate **Split MIDI Controllers** to make sure all controllers have the correct value at the beginning of the second part.

Editing - Project & MixConsole

Select Channel/Track on Solo

When you activate this option, a track in the track list or a channel in the **MixConsole** automatically gets selected when the **Solo** button is activated. Deactivating this option always keeps the current selection status, regardless of the solo setting for the tracks.

Select Channel/Track on Edit Settings

When you activate this option, a track in the track list or a channel in the **MixConsole** automatically gets selected when you click the respective edit button (e). Deactivating this option always keeps the current track/channel selection.

Scroll To selected Track

If you activate this option, selecting a **MixConsole** channel automatically scrolls the track list to display the respective track.

Sync Selection in Project Window and MixConsole

If this is activated, and you select a track in the **Project** window, the corresponding channel is automatically selected in the **MixConsole** and vice versa.

This can be a very handy feature when making detailed settings for audio and MIDI channels: open the **Channel Settings** window for a track by clicking its edit “e” button, and position it so that it can remain open without obstructing the view. Then you can simply select the track for which you want to make settings in the **Project** window. The **Channel Settings** window will automatically change to show the settings for the selected track.

Enable Record on Selected Audio Track

When this is activated, selected audio tracks are automatically record enabled.

Enable Record on Selected MIDI Track

When this is activated, the selected MIDI tracks are automatically record enabled.

Enable Solo on Selected Track

When this is activated, the selected tracks are automatically soloed.

Deep Track Folding

If this option is activated, any folding settings that you make on the **Track Folding** submenu of the **Project** menu also affect the subelements of the tracks. For example, if you fold in a folder track that contains 10 audio tracks, of which 5 have several open automation tracks, all these audio tracks within the folder track will also be folded in.

Enlarge Selected Track

Activate this option to enter a mode where the selected track in the **Project** window will be enlarged. You can adjust the size directly in the track list if the default enlargement factor does not suit you. When you select another track in the track list, this track is automatically enlarged, and the previously selected track is displayed in its previous size.

Editing - Tool Modifiers

On this page you can specify which modifier keys are used for additional functionality when using tools.

PROCEDURE

1. Select an option in the **Categories** list.
2. Select the action for which you want to edit the modifier key in the **Action** list.
3. On your computer keyboard, hold down the modifier keys and click **Assign**.

RESULT

The current modifier key(s) for the action is replaced. If this tool already has assigned modifier key(s), you will be asked whether you want to replace them.

Editing - Chords (NEK only)

‘X’ Chords Mute Notes on Tracks That are in Follow Chord Track Mode

This determines what happens when you play back a track that follows the chord track and the cursor reaches an undefined chord event (X chord). Activate this option to mute playback. Deactivate this option to continue playback of the last defined chord event.

Disable ‘Acoustic Feedback’ during Playback

If you activate this option, **Acoustic Feedback** is automatically disabled on playback. This ensures that chord events are not triggered twice.

Hide muted Notes in Editors

If you set up a MIDI track to follow the chord track by activating one of the **Follow Chord Track** options, some of the original MIDI notes may be muted. Activate this option to hide these notes in the editors.

Editing - Tools

Select Tool: Show Extra Info

Activate this to show a tooltip for the **Object Selection** tool in the **Project** window event display. This tooltip indicates the current pointer position and the name of the track and event at which you are pointing.

Warn before switching Display Domain (Timewarp Tool)

If this is activated, a warning opens if you select the **Timewarp** tool and the ruler is not set to **Bars and Beats**.

Zoom Tool Standard Mode: Horizontal Zooming Only

This affects the result when using the **Zoom** tool (magnifying glass).

If this is activated and you drag a selection rectangle with the **Zoom** tool, the window is only zoomed horizontally and the track height does not change. If this option is deactivated, the window is zoomed both horizontally and vertically.

Pop-up Toolbox on Right-Click

If this is activated, the toolbox opens on right-click in the event display and editors. You can change the number of rows in which the tools are arranged on the toolbox. Keep the right mouse button pressed until the mouse pointer changes to a double arrow and drag to the bottom or right.

- To open the context menu instead of the toolbox, press any modifier key when right-clicking.

Cross-Hair Cursor

This allows you to set up a cross-hair cursor when working in the event display and editors, facilitating navigation and editing, especially when arranging in large projects. You can set up the colors for the line and the mask of the cross-hair cursor, and define its width. The cross-hair cursor works as follows:

- If the **Selection** tool (or one of its subtools) is selected, the cross-hair cursor appears when you start moving or copying a part/event or when you use the event trim handles.
- If the **Draw** tool, the **Cut** tool, or any other tool that makes use of this function is selected, the cross-hair cursor appears as soon as you move the mouse over the event display.
- The cross-hair cursor is only available for tools where such a function is of any use.

Event Display

The **Event Display** section contains several settings for customizing the display in the **Project** window.

Show Event Names

Determines whether the names of parts and events are shown.

Show Event Data on Small Track Heights

If this is activated, the contents of events and parts are shown, even if the height of a track is very small.

Transparent Events

When this is activated, events and parts are transparent, and shows only the waveforms and MIDI events.

Outline Event Data

Allows you to select whether you want event data to be displayed as solid images or with an outline.

Colorize Event Background

When you select a color for a track or for individual events or parts, this setting determines how the color is applied:

- If deactivated, the contents of the events and parts are colorized. In the case of audio events, the waveform images are colorized. For MIDI parts, the MIDI events are colorized.
- If activated, the background of the events/parts are colorized, and the contents (waveforms/MIDI events) are displayed in black.

Event Display - Audio

Addition to Event Name

Allows you to add meta-data to the event name.

Further Addition to Event Name

Allows you to add more meta-data to the event name.

Interpolate Audio Waveforms

If you have zoomed in to one sample per pixel or less, the appearance of the samples depends on this setting. If the option is deactivated, single sample values are drawn as steps. If the option is activated, the sample values are interpolated to form curves.

Show Event Volume Curves Always

If activated, event volume curves, as created by the fade and volume handles, are shown for all events, regardless of whether they are selected or not. When the option is deactivated, volume curves are only shown for selected events. However, note that you can still adjust fades and volumes for events that are not selected, by clicking and dragging the top left, middle, or right edge respectively.

Thick Fade Lines

If activated, the fades and volume curve are displayed by thicker lines for better visibility.

Show Waveforms

If activated, audio waveforms are displayed for audio events.

Show Hitpoints on Selected Events

If activated, hitpoints are displayed for audio events.

Background Color Modulation

When this is activated, the backgrounds of audio waveforms reflect the waveform dynamics. This is especially useful to get an overview when working with small track heights.

Event Display - Folders

Show Event Details

If this option is activated, event details are displayed. If deactivated, data blocks are displayed.

This setting depends on the **Show Data on Folder Tracks** setting.

Show Data on Folder Tracks

Determines in which case data blocks or event details are displayed on folder tracks.

- **Always Show Data**
  If this option is activated, data blocks or event details are always displayed.
- **Never Show Data**
  If this option is activated, nothing is displayed.
- **Hide Data When Expanded**
  If this option is activated, the display of events is hidden when you open folder tracks.

Event Display - MIDI

Default Edit Action

Determines which editor is opened when you double-click a MIDI part or when you select it and press [Ctrl]/[Command]-[E]. Note that this setting is overwritten for tracks with drum maps if the **Edit as Drums when Drum Map is assigned** option is activated (NEK only).

Part Data Mode

Determines if and how events in MIDI parts are shown: not shown, as lines, as score notes, as drum notes, or as blocks. NEK only: Note that this setting is overwritten for tracks with drum maps if the **Edit as Drums when Drum Map is assigned** option is activated.

Show Controllers

Governs whether non-note events such as controllers, etc. are shown in MIDI parts.

Edit as Drums when Drum Map is assigned (NEK only)

If this is activated, parts on MIDI tracks to which drum maps are assigned are shown with drum note symbols. The parts will automatically open in the **Drum Editor** on double-click. This overwrites the **Default Edit Action** setting.

Event Display - Tracks

Colorize Track Controls

This slider allows you apply the track color to the track controls. Drag the slider to the right to intensify the color.

Colorize Only Folder Track Controls

Activate this to restrict the effect of the **Colorize Track Control** function to folder tracks only. This is useful in projects with a large number of tracks and folder tracks.

Default Track Name Width

Allows you to determine the default name width for all track types.

Auto Track Color Mode

This offers you several options for automatically assigning colors to tracks that are added to the project:

- **Use Default Track Color**
  New tracks get the default event color.
- **Use Previous Track Color**
  New tracks get the same color as the track above them in the track list.
- **Use Previous Track Color + 1**
  This is similar to the **Use Previous Track Color** option, except that the new tracks get the next color in the color palette.

- **Use Last Applied Color**
  New tracks get the color that you last applied to an event/part.
- **Use Random Track Color**
  Inserted tracks get random track colors.

Event Display - Chords

Pitch Notation

- The **Note Name** pop-up menu lets you select between three ways of displaying chords.
- The **Naming Format** pop-up menu lets you determine how MIDI note names (pitches) are displayed in editors, etc.
- The options **Display 'Bb' as 'B'** and **Display 'B' as 'H'** allow you to change the corresponding pitch names.

Chord Font

Allows you to specify a font for all chord symbols.

Chord Symbols

There are several ways of indicating chord types, for example, major and minor chords. These options allow you to select your preferred display method for major 7th chords, minor chords, half-diminished chords, diminished chords, and augmented chords.

General

The **General** page contains general settings that affect the program user interface. Set these according to your preferred work methods.

Language

Allows you to select which language is used in the program. After switching the language, you must restart the program for the change to take effect.

Auto Save

If this is activated, Nuendo automatically saves backup copies of all open projects with unsaved changes. These are named `Name.bak`, where name is the name of the project, and are saved in the project folder. Backup copies of unsaved projects are named `#UntitledX.bak` where X is an incremental number, to allow multiple backup copies in the same project folder.

Auto Save Interval

Allows you to specify how often a backup copy is created.

Maximum Backup Files

Allows you to specify how many backup files will be created with the **Auto Save** function. When the maximum number of backup files is reached, the existing files will be overwritten (starting with the oldest file).

Show Tips

If this is activated and you position the pointer over an icon or button in Nuendo, an explanatory tooltip is displayed after a second.

Maximum Undo Steps

Allows you to specify the number of undo levels.

Use Undo Branches

If this is activated, edit actions in the **Edit History** dialog and automation actions on the automation panel are gathered in branches. A new branch is always created when you undo an action.

Run Setup on Create New Project

If this is activated, Nuendo automatically displays the **Project Setup** dialog every time you create a new project. This allows you to specify the basic project configuration.

Open Projects in Last Used View

Allows you to select whether projects are opened using their original window layout and settings, or using the view that you last used on your computer. This can either be the last used view that was saved on your computer or one of your specified global workspaces.

- **Never**
  Projects are always opened using their original window layout and settings.
- **Only External Projects**
  Projects that have been created on a different computer are opened using the view that you last used on your computer. Projects that have been created on this computer are opened using their original window layout and settings.
- **Always**
  Projects are always opened using the view that you last used on your computer.

Open Last Project on Startup

If this option is activated, the last saved project is opened when you start Nuendo.

Use Steinberg Hub

Activate this option to open Steinberg Hub when you start Nuendo or create a new project using the **File** menu.

General - Personalization

Default Author Name

Allows you to specify an author name that is used by default for new projects. This will be included as metadata when exporting audio files with an iXML chunk.

Default Company Name

Allows you to specify a company name that is used by default for new projects. This will be included as metadata when exporting audio files with an iXML chunk.

MIDI

This page contains settings that affect MIDI recording and playback.

MIDI Thru Active

If this is activated, all MIDI tracks that are record enabled or have monitoring activated will “echo” incoming MIDI data, sending it back out on their respective MIDI outputs and channels. This allows you to hear the correct sound from your MIDI instrument during recording.

NOTE

If you use MIDI Thru, select **Local Off** mode on your MIDI instrument to prevent each note from sounding twice.

Reset on Stop

If this is activated, Nuendo sends out MIDI Reset messages (including noteoff and controller resets) on stop.

Never Reset Chased Controllers

If this is activated, controllers are not reset to 0 when you stop playback or move to a new position in the project.

Length Adjustment

This allows you to enter a length adjustment value in ticks by which the notes that have the same pitch and MIDI channel are adjusted. This ensures that there is always a short time between the end of one note and the start of another. By default, there are 120 ticks per 1/16 note, but you can adjust this with the **MIDI Display Resolution** setting.

Chase Events

Event types for which an option is activated are chased when you locate to a new position and start playback. This makes your MIDI instruments sound as they should when you locate to a new position and start playback.

If **Chase not limited to Part Boundaries** is activated, MIDI controllers are also chased outside the part boundaries, and the chase is performed on the part touched by the cursor as well as on all the parts to the left of it. Deactivate this for very large projects, as it slows down processes such as positioning and soloing.

MIDI Display Resolution

This allows you to set the display resolution for viewing and editing MIDI data. This only affects how MIDI events are displayed and not how they are recorded.

Insert Reset Events after Record

If this is activated, a reset event is inserted at the end of each recorded part. This resets controller data, such as **Sustain**, **Aftertouch**, **Pitchbend**, **Modulation**, **Breath Control**. This is useful if you stop recording before the note off command is sent, for example.

Audition through MIDI Inserts/Sends

If this is activated, the layering of MIDI instruments (by MIDI sends) is also active within the MIDI editors. This way, the acoustic feedback of the editors sends the MIDI data not only to the output selected for the track, but additionally through any MIDI inserts and MIDI sends assigned to it. Note, however, that this also means that MIDI events will be sent through any MIDI plug-ins assigned to this track.

MIDI Max. Feedback in ms

This allows you to set the maximum length of the notes when using **Acoustic Feedback** in MIDI editors.

MIDI - MIDI File

Export Options

These options allow you to specify what data is included in exported MIDI files.

Export Inspector Patch

If this is activated, the MIDI patch settings in the Inspector - Bank Select and Program Select (used for selecting sounds in the connected MIDI instrument) are included as MIDI Bank Select and Program Change events in the MIDI file.

Export Inspector Volume/Pan

If this is activated, Volume and Pan settings made in the Inspector are included as MIDI Volume and Pan events in the MIDI file.

Export Automation

If this is activated, the automation data (just as it is heard during playback) is converted to MIDI controller events and included in the MIDI file. This also includes automation recorded with the MIDI Control plug-in.

Note that if a continuous controller (e.g. CC7) has been recorded but the Read button is deactivated for the automation track (i.e. the automation is effectively switched off for this parameter), only the part data for this controller will be exported.

If this option is deactivated and the Read Automation button is activated, no continuous controllers will be exported. If the Read button is deactivated, the controller data of the MIDI part are exported (these will now be handled like "regular" part data).

It is recommended to activate the "Export Automation" option.

Export Inserts

If this is activated and you are using MIDI modifiers or any MIDI plug-ins as insert effects, the modifications to the original MIDI notes that occur as a result of the effect(s) will be included in the MIDI file. A MIDI delay, for example, will produce a number of repeats to a MIDI note by actually adding additional, "echoing" notes at rhythmic intervals - these notes will be included in the MIDI file if the option is activated.

Export Sends

If this is activated and you are using any MIDI plug-ins as send effects, the modifications to the original MIDI notes that occur as a result of the effect(s) will be included in the MIDI file.

Export Markers

If this is activated, any markers you have added will be included in the MIDI file as Standard MIDI File Marker events.

Export as Type 0

If this is activated, the MIDI file will be of Type 0 (all data on a single track, but on different MIDI channels). If you do not check this option, the MIDI file will be of Type 1 (data on separate tracks). Which type to choose depends on what you want to do with the MIDI file (in which application or sequencer it is to be used).

Export Resolution

You can specify a MIDI resolution between 24 and 960 for the MIDI file. The resolution is the number of pulses, or ticks, per quarter note (PPQ) and determines the precision with which you will be able to view and edit the MIDI data. The higher the resolution, the higher the precision. The resolution should be chosen depending on the application or sequencer with which the MIDI file will be used though, because certain applications and sequencers may not be able to handle certain resolutions.

Export Locator Range

If this is activated, only the range between the left and right locator will be exported.

Export includes Delay

If this is activated, any delay settings you have made in the **Inspector** will be included in the MIDI file.

NOTE

To include other **Inspector** settings, you must convert the settings to real MIDI events and properties by using the **Merge MIDI in Loop** function for each track.

NOTE

Exported MIDI files include the tempo and time signature events of the **Tempo Track Editor** or, if the tempo track is deactivated, the current tempo and time signature.

Import Options

These options allow you to specify what data is included in imported MIDI files.

Extract First Patch

If this is activated, the first Program Change and Bank Select events for each track are converted to Inspector settings for the track.

Extract First Volume/Pan

If this is activated, the first MIDI Volume and Pan events for each track are converted to Inspector settings for the track.

Import Controller as Automation Tracks

If this is activated, MIDI controller events in the MIDI file will be converted to automation data for the MIDI tracks. If this is deactivated, controller data for the MIDI parts will be imported.

Import to Left Locator

If this is activated, the imported MIDI file will be placed so that it starts at the position of the left locator - otherwise it will start at the beginning of the project. Note that if you choose to have a new project created automatically, the MIDI file will always start at the beginning of the project.

Import Markers

If this is activated, Standard MIDI File Markers in the file will be imported and converted to Nuendo markers.

Import dropped File as single Part

If this is activated and you drag and drop a MIDI file into the project, the whole file will be placed on a single track.

Ignore Master Track Events on Merge

If this is activated and you import a MIDI file into the current project, tempo track data in the MIDI file is ignored. The imported MIDI file will play according to the current Tempo track in the project.

If this option is deactivated, the Tempo Track Editor will be adjusted according to the tempo information in the MIDI file.

Auto Dissolve Format 0

If this is activated and you import a MIDI file of type 0 into the project, the file will automatically be “dissolved”: For each embedded MIDI channel in the file, a separate track will be inserted in the Project window.

If this is deactivated, only one MIDI track will be created. This track will be set to MIDI Channel “Any”, allowing all MIDI events to play back on their original channels. You can also use the “Dissolve Part” function on the MIDI menu to distribute the events onto different tracks (or lanes) with different MIDI Channels at a later stage.

Destination

This allows you to specify what happens when you drag a MIDI file into the project:

- Select **MIDI Tracks** to create MIDI tracks for the imported file.
- Select **Instrument Tracks** to create instrument tracks for each MIDI channel in the MIDI file and let the program automatically load appropriate presets.
- Select **HALion Sonic SE multi-timbral** to create several MIDI tracks, each routed to a separate instance of HALion Sonic SE in the **VST Instruments** window and load the appropriate presets.

Import Karaoke Lyrics as Text

Activate this to convert karaoke lyrics in the MIDI file to text that can be displayed in the **Score Editor**. If this is deactivated, lyrics are only shown in the **List Editor**.

MIDI - MIDI Filter

This page allows you to prevent certain MIDI messages from being recorded and/or echoed by the MIDI Thru function (thruput). The page is divided into four sections:

Record

Activating any of these options prevents the corresponding type of MIDI message from being recorded. It will, however, be thruput, and if already recorded, it will play back normally.

Thru

Activate any of these options to prevent the corresponding type of MIDI message from being thruput. It will, however, be recorded and played back normally.

Channels

If you activate a Channel button, no MIDI messages on that MIDI Channel will be recorded or thruput. Already recorded messages will however be played back normally.

Controller

Allows you to prevent certain MIDI controller types from being recorded or thruput.

To filter out a controller type, select it from the list at the top of the section and click “Add”. It will appear in the list below.

To remove a controller type from the list (allow it to be recorded and thruput), select it in the lower list and click “Remove”.

MediaBay

Maximum Items in Results List

This allows you to specify the maximum number of files that are displayed in the **Results** list. This helps you to avoid unmanageably long lists of files in the **Results** list.

Allow Editing in Results List

Activate this to edit attributes also in the **Results** list. Otherwise, editing can only be done in the **Attribute Inspector**.

Show File Extensions in Results List

Activate this to display file name extensions in the **Results** list.

Scan Folders only when MediaBay is open

Activate this to scan Nuendo for media files when the **MediaBay** window is open. Otherwise, the folders are scanned in the background even when the **MediaBay** window is closed.

NOTE

During playing back or recording no folder scans are performed.

Scan unknown File Types

Activate this to open and scan any file in the search location and ignore files that cannot be recognized.

Metering

Map Input Bus Metering to Audio Track (in Direct Monitoring)

This allows you to map the input bus metering to monitor-enabled audio tracks, giving you the opportunity to watch the input levels of your audio tracks when working in the **Project** window. For this to work, activate **Direct Monitoring** in the **Device Setup** dialog.

- If this option is activated, audio tracks show the metering signal from the input bus to which they are routed as soon as the track is monitor-enabled. Note that the tracks are mirroring the input bus signal, that is, you will see the same signal in both places. When using mapped metering, any functions, such as trimming, that you apply to the audio track are not reflected in its meters.
- If this option is not activated, metering works as usual.

Meters' Peak Hold Time

This allows you to specify for how long the peak levels are held in the meters. For this to work, deactivate **Meters - Hold Forever** in the **MixConsole**.

Meters' Fallback

This allows you to specify how quickly the meters in the **MixConsole** return to lower values after signal peaks.

Metering - Appearance

On this page you can assign colors to level meter values to quickly identify what levels are reached. You can adjust the colors for the channel meter or the master meter. For the master meter you can only make changes for the **Digital Scale** scaling mode. Changes take effect when you click **Apply** or **OK**.

To adjust the levels and colors, activate the channel meter or master meter option and proceed as follows:

- To specify the level for a color change, double-click a handle to the right of the meter scale and enter the level (dB) value. Note that for dB values less than 0, you must add a minus sign before the entered number. You can also click a handle and drag it to a specific level. Press [Shift] for more accurate positioning. Alternatively, you can nudge with the Arrow Up/Down keys. Press [Shift] for faster positioning.
- To assign a color, click the upper or lower part of a handle so that a black frame is shown, and use the color selector pane to select a color. Selecting the same color for the upper and lower part of the handle results in a meter that changes its colors gradually, while different colors indicate level changes even more precisely.
- To add more color handles, click the **Add** button, or [Alt]/[Option]-click at a level position to the right of the meter scale. Each new handle is automatically associated with a default color.
- To remove a handle, select the handle and click the **Remove** button, or [Ctrl]/[Command]-click the handle.

Record

This page contains settings related to audio and MIDI recording. Select one of the available entries.

Record - Audio

Audio Pre-Record Seconds

This allows you to specify for how many seconds any incoming audio you play is captured in buffer memory during playback or in stop mode.

When Recording Wave Files larger than 4GB

This allows you to specify what happens if you record Wave files that are larger than 4 GB.

- To split the Wave file, activate **Split Files**.
  Use this, if you work on a FAT32 file system that supports only file sizes up to 4 GB.
- To save the Wave file as RF64 file, activate **Use RF64 Format**.
  RF64 files use the `.wav` extension. However, they can only be opened with an application that supports the RF64 standard.

Create Audio Images During Record

If this option is activated, Nuendo calculates the waveform image and displays it during the actual recording process.

NOTE

This realtime calculation uses some extra processing power.

Record - Audio - Broadcast Wave

This page allows you to specify the **Description**, **Author**, and **Reference** text strings that are embedded in recorded Broadcast Wave files. The settings you make here also appear as default strings in the **Broadcast Wave Chunk** dialog when you export files to certain formats (not only Broadcast Wave files can contain embedded information, but also Wave, Wave 64, and AIFF files).

Record - MIDI

Record-Enable allows MIDI Thru

Activate this option if you do not want record-enabled MIDI or instrument tracks to echo incoming MIDI data. This prevents hearing doubled notes on record-enabled tracks to which a VST instrument is assigned.

Snap MIDI Parts to Bars

Activate this to lengthen recorded MIDI parts automatically to start and end at whole bar positions. If you are working in a Bars+Beats-based context, this can make editing (Moving, Duplicating, Repeating, etc.) easier.

Solo Record in MIDI Editors

Activate this to automatically Record Enable a track when you open a part for editing in a MIDI editor. For all other MIDI tracks Record Enable is deactivated until you close the editor again.

This makes it easier to record MIDI data when you edit a part – you will always be sure the recorded data ends up in the edited part and not on any other track.

MIDI Record Catch Range in ms

When you record starting at the left locator, this setting helps you make sure that the very start of the recording is included. If you raise the Record Catch Range, Nuendo will catch the events played just before the recording start point, eliminating this problem.

Retrospective Record

When this is activated, the program captures MIDI input in buffer memory, even when not recording. The contents of the buffer memory can then be retrieved and turned into a MIDI part on a record enabled MIDI track. This therefore allows you to capture any MIDI notes you play in stop mode or during playback and later turn them into a recorded MIDI part.

Use the “Retrospective Record Buffer Size” setting to determine how much MIDI data can be captured in the buffer.

ASIO Latency Compensation Active by Default

This determines the initial state of the “ASIO Latency Compensation” button in the track list for MIDI or instrument tracks.

If you record live on a VST instrument, you usually compensate the latency of your audio card by playing too early. In consequence, the timestamps are recorded too early. By activating this option, all recorded events are moved by the current latency, and playback sounds like during the recording situation.

Replace Recording in Editors

This affects the result of recording in a MIDI editor when Replace Mode is selected (Linear Record Mode on the Transport panel):

- **None**
  Nothing is replaced, even though Replace Mode is selected.
- **Controller**
  Only controller data is replaced, not notes.
- **All**
  Replace mode works as usual - notes and controllers are replaced when recording.

Scores (NEK only)

This page allows you to make settings for the Score Editor. Please select one of the available entries.

Scores - Colors for Additional Meanings

Here, you can specify different colors to identify non-standard elements in the score.

- Click in the **Active** column to activate this function for the respective element.
- Click in the color field to the right to specify the desired color.

Scores - Editing

Display Object Selection tool after Inserting Symbol

When this is activated, as soon as you add a symbol, the program switches back to the Object Selection tool. When this is deactivated, the Draw tool remains active after inserting a symbol.

Double-Click Symbol to get Draw tool

When this is activated, you need to double-click with the Object Selection tool in a Palette to activate the Draw tool. When this is deactivated, a single click is enough to bring out the Pencil.

Keep Crescendo Symbols “Horizontal”

When this is activated, crescendo symbols are never “slanted”.

Keep moved Notes within Key

When this is activated, and you move notes vertically (to transpose them), you will be restricted to pitches within the current key.

Tied Notes selected as Single Units

When this is activated, and you click on either note in a tied note pair, both notes will be selected.

Global Staff Spacings with [Alt-Gr + Ctrl] (Win)/[Option]-[Command] (Mac)

When this is activated, pressing [Alt-Gr + Ctrl] (Win) or [Option]-[Command] (Mac) and adjusting the spacing of staves applies the spacing to all staves on the current page and on all the following pages. When this is deactivated, the spacing is only applied to the current page.

Auto Layout: Don’t hide first staff

This option affects the Auto Layout functions “Hide Empty Staves” and “Optimize All”. When “Don’t hide first staff” is activated, staves in the very first grand staff will not be hidden, even if they are empty.

Show Braces in Edit Mode

Normally, braces are only shown in Page Mode. With this option activated they will also be visible in Edit Mode.

“Apply” closes Property Windows

Normally, when you open a Property window or any non-modal score dialog (e.g. Set Note Info or Score Settings), you can adjust the settings and click Apply to apply the changes without closing the window. When this option is activated, clicking Apply closes the window.

Show Position Cursor

When this is activated the Project cursor position is shown as a vertical line in the score. You can click and drag the line to move the cursor or hold down [Ctrl]/[Command] and click anywhere in the score to move the cursor directly there.

Show pitch when inserting notes

If this is activated the pitch of inserted notes is indicated.

Show Note Info by the Mouse

When this is activated and you insert or drag a note in the score, a tooltip will appear below the pointer, showing the current pitch and position. If you feel screen redraws are too slow, you may want to turn this feature off.

Snap Slurs when dragging

When this is activated, the endpoints of slurs will snap to notes when you draw or move them.

Unlock Layout when editing single parts

If there are more than one part on a track, and you open score edit for one of these parts, the other parts are displayed as “empty space” to preserve the layout. If this option is activated, this empty space is avoided, so you can print this single part without endless rests.

NOTE

Note that this option will erase the layout for the whole track! The next time you open the entire track, the previous layout will be overwritten with the layout settings you made for the single edited part.

Double-click on staff flips between full score/part

When this option is activated, double-clicking on a staff will switch between display of either the whole track or the current part.

NOTE

Note that in this case, the Score Settings dialog will only open if you select the “Settings...” option on the Scores menu.

Layout Tool Compatibility Mode

The behavior of the Layout tool was different in older versions of Nuendo. Activate this option if you have an old project in which the Layout tool was used to ensure that the project is displayed as expected.

Hide Notes beyond limits

When this option is activated, any notes outside the Note Limits range set in the Score Settings dialog (Staff page - Options tab) will be hidden.

Default Number of Bars per Staff

This is used in two cases:

- In Edit Mode to set how many bars are shown across the page.
- In Page Mode to decide how many bars there are shown across the page in a new layout.

NOTE

When using the Auto Layout function, you will be asked for the maximum number of bars across the page, overriding this setting.

Scores - Note Layer

If you are moving and editing notes, you might accidentally move other objects nearby. To avoid this, you can assign different types of objects to different Note Layers (up to three) and instruct Nuendo to lock one or two of these layers, making them unmovable.

This page is where you specify to which layer each object type belongs. The actual locking of layers is done on the extended toolbar of the Score Editor.

Transport

This page contains options related to playback, recording and positioning.

Playback Toggle triggers Local Preview

If this option is activated, you can use the [Space bar] on your keyboard to start/stop “local” playback of the selected file in the Sample Editor or the Pool.

When the Sample Editor is not open or when there is no audio file selected in the Pool, the [Space bar] still toggles the “global” project playback.

If this option is deactivated, the [Space bar] is used to start/stop playback of the project.

Zoom while Locating in Time Scale

If this option is activated, you can zoom in or out by clicking in the Ruler and dragging down or up.

Cursor Width

Adjusts the width of the Project Cursor line.

Return to Start Position on Stop

If this option is activated and you stop playback, the project cursor automatically returns to the position where recording or playback last started.

If this option is deactivated and you stop playback, the project cursor remains at the position where you stop playback.

If you click **Stop** again, the project cursor returns to the position where recording or playback last started.

Deactivate Punch In on Stop

If this is activated, Punch In on the Transport panel is automatically deactivated whenever you enter Stop mode.

Stop after Automatic Punch Out

If this is activated, playback will automatically stop after automatic Punch Out (when the Project Cursor reaches the Right Locator and Punch Out is activated on the Transport panel). If the Post-roll value on the Transport panel is set to a value other than zero, playback will continue for the set time before stopping.

Stop playback while winding

You can use the winding functions during playback. If this option is activated, audio playback is stopped as soon as you click the Rewind or Fast Forward buttons on the Transport panel.

If this option is deactivated, audio playback will continue until you release the Rewind or Fast Forward button.

Wind Speed Options

These options affect the fast forward/rewind speed.

- If **Adjust to Zoom** is activated, the wind speed will be adapted to the horizontal zoom factor.

  If you zoom in very close for detailed editing, you probably do not want to have a high fast forward/rewind speed. Because of this, the **Speed Factor** does not have any effect in this mode. The **Fast Wind Factor** still applies though.

- If **Fixed** is activated, the wind speed will always be the same regardless of the horizontal zoom factor.

- Use the **Speed Factor** option to set the wind speed. You can set a value between 2 and 50. The higher the value, the faster the wind speed will be.

  If **Adjust to Zoom** is activated, this has no effect.

- Use the **Fast Wind Factor** to set the wind speed multiple for fast winding.

  If you press [Shift] while fast forwarding or rewinding, the wind speed will increase. The increase in speed is a multiple of the **Speed Factor**. Meaning that if you set the **Fast Wind Factor** to 2, the wind speed will be twice as fast. If you set it to 4, the wind speed will be four times as fast, etc. You can set a value between 2 and 50.

Show Timecode Subframes

If this is activated, all frame based display formats (".fps" and ".dfps") will also show subframes. There are 80 subframes per frame.

Timecode Input Scheme

You can enter a timecode value on the **Transport** panel. If you press [Shift]-[P], a specific timecode position is focused. Select one of the following options:

- **Full Timecode**

  Allows you to enter the timecode as a sequence of numbers. For example, entering `010203` results in **00:01:02:03**.

- **Starting at Hour Position**

  Allows you to enter the timecode per entry field, starting with hours.

- **Starting at Minute Position**

  Allows you to enter the timecode per entry field, starting with minutes.

Feet'n'Frames Count from Project Start

If you use any of the "Feet+Frames" display formats, you can activate this.

If this is activated, time displays and rulers in Feet+Frames format will always start with 0'00 at the beginning of the project - regardless of any Start offset settings in the Project Setup dialog.

User-definable Frame Rate

This is where you set the frame rate (the number of frames per second) for the Display format "User". This frame rate will then be used in every ruler for which you select the User display format.

Stationary Cursors

If this option is activated, the Project cursor will be positioned in the middle of the screen (if possible), and the window will scroll continuously during playback (instead of moving from one "page" to the next).

Locate When Clicked in Empty Space

If this is activated, you can move the Project Cursor by clicking anywhere in an "empty" area of the Project window.

RELATED LINKS

Locating to Specific Time Positions on page 230

Transport - Scrub

Scrub Volume

This lets you set the playback volume for the Scrub function in the Project window and audio editors.

Use High Quality Scrub Mode

When you activate this option, effects are enabled for scrubbing and the resampling quality is higher. However, scrubbing will be more demanding on the processor.

Use Inserts While Scrubbing

When you activate this option, you can activate insert effects for scrubbing with the shuttle speed control. By default, insert effects are bypassed.

VST

This page contains settings for the VST audio engine.

Connect Sends automatically for each newly created Channel

When this option is enabled, creating a new audio or group channel will automatically connect the send routing for existing FX channels. Note that this option is disabled by default to save memory resources.

Instruments use Automation Read All and Write All

If you deactivate this option, the Read and Write automation status in VST instrument panels are not affected by the “Activate/Deactivate Read for All Tracks” and “Activate/Deactivate Write for All Tracks” automation switches.

Mute Pre-Send when Mute

If this is activated, sends set to “Pre-fader” mode will be muted if you mute their channels.

Default Send Level

This allows you to specify a default level for your send effects.

Group Channels: Mute Sources as well

By default, when you mute a group channel no audio will pass through the group. However, other channels that are routed directly to that group channel will remain unmuted. If any of those channels have cue sends routed to other group channels, FX channels or output busses, those will still be heard.

If **Group Channels: Mute Sources as well** is activated, muting a group channel will cause all other channels directly routed to it to be muted as well. Pressing mute again will unmute the group channel and all other channels directly routed to it. Channels that were muted prior to the group channel being muted will not remember their mute status and will be unmuted when the group channel is unmuted.

NOTE

Group Channels: Mute Sources as well does not affect how mute automation is written. Writing mute automation on a group channel only affects the group channel and not channels routed to it. When writing the automation you will see the other channels being muted when this option is checked. However, upon playback, only the group channel will respond to the automation.

Delay Compensation Threshold (for Recording)

Nuendo features full delay compensation - any delay inherent in the VST plug-ins you use will automatically be compensated for during playback. However, when you play a VST instrument in realtime or record live audio (with monitoring through Nuendo activated), this delay compensation may result in added latency. To avoid this, you can click the Constrain Delay Compensation button on the Project window toolbar. This function tries to minimize the latency effects of the delay compensation, while maintaining the sound of the mix as far as possible.

The Delay Compensation Threshold setting is a kind of “tolerance” setting for the Constrain Delay Compensation function - only plug-ins with a delay higher than this threshold setting will be affected by the Constrain Delay Compensation function. By default, this is set to 0.0 ms, which means that all plug-ins will be affected (e.g. turned off) when you activate Constrain Delay Compensation. If you feel that a little latency is acceptable, you can raise this threshold value.

Do not Connect Input/Output Busses When Loading External Projects

Activate this option to load external projects without automatically connecting their input and output busses to the ASIO ports of your system. If you often work with projects created on computers that have ASIO configurations different from the configurations of your own system, this option prevents unwanted audio connections.

Default Stereo Panner Mode

This allows you to specify the default pan mode for inserted audio tracks (Stereo Balance Panner, Stereo Dual Panner or Stereo Combined Panner).

Default Stereo Panner Mode

This allows you to specify the default pan mode for inserted audio tracks (Stereo Balance Panner, Stereo Dual Panner or Stereo Combined Panner).

Activate ‘Link Panners’ for New Tracks

Activate this to activate **Link Panners** by default for new tracks so that the channel sends section always mirrors the Pan settings made in the channel fader section.

Auto Monitoring

Determines how Nuendo handles monitoring (listening to the input signal during recording). The following options are available:

- **Manual**
  This option allows you to turn input monitoring on or off by clicking the monitor button in the track list, Inspector, or MixConsole.
- **While Record Enabled**
  With this option you will hear the audio source connected to the channel input whenever the track is record enabled.
- **While Record Running**
  This option switches to input monitoring only during recording.
- **Tapemachine Style**
  This option emulates standard tapemachine behavior: input monitoring in Stop mode and during recording, but not during playback.

NOTE

The automatic monitoring options apply when you are monitoring through Nuendo, or when you are using ASIO Direct Monitoring. If you are monitoring externally (listening to the input signal from an external mixer, for example), select the “Manual” mode and keep all audio monitor buttons turned off in Nuendo.

Warn on Processing Overloads

When you activate this option, a warning message is displayed as soon as the CPU overload indicator (on the Transport panel) lights up during recording.

VST - Plug-ins

Warn Before Removing Modified Effects

If this is activated, a dialog will appear whenever you remove an effect plug-in for which you have made parameter changes, asking for confirmation as to whether you really want to remove the effect.

If you do not want this dialog to appear and modified effects to be removed without confirmation, leave this option deactivated.

Open Effect Editor after Loading it

When this is activated, loading an effect or VST instrument (e.g. in one of the plug-in slots of the Send or Insert sections) will automatically open the control panel for the plug-in.

Create MIDI track when loading VSTi

This pop-up menu allows you to what specify happens when you add a VSTi in the VST Instruments window. The following options are available:

- **Always**
  When this is selected, a corresponding MIDI track will always be created when you add a VST instrument.
- **Do not**
  When this is selected, no MIDI track will be created when you add a VSTi in the VST Instruments window. This is the behavior from earlier versions of Nuendo.
- **Always ask to**
  When this is selected, you will be asked whether a corresponding MIDI track is created when you add a VSTi in the VST Instruments window.

Suspend VST3 plug-in processing when no audio signals are received

When this is activated, VST plug-ins will not consume any CPU power during “silent” passages, i.e. when no audio is passing through them. This can improve system performance noticeably.

NOTE

Note however that this might lead to situations where you loaded more plug-ins in Stop mode than the system will be able to play back simultaneously. As a safety measure, try playing back the part of your project which contains the largest number of audio events to make sure that your computer system can handle the current number of VST plug-ins.

Synchronize Plug-in Program Selection to Track Selection

If you route multiple MIDI tracks to multi-timbral instruments and activate this option, track selection and plug-in program selection are synchronized.

Plug-in Editors “Always on Top”

When this is activated, the control panels for effect plug-ins and VST instruments will always be shown on top of other windows.

VST - Control Room

This page contains settings for the Control Room.

Show Control Room Volume in Transport Panel

When this is activated, the Transport panel will display the Control Room Volume if the Control Room is enabled. If the Control Room is disabled, the volume of the Main Mix bus will be shown in the Transport panel.

Auto Disable Talkback Mode

Allows you to specify, if Talkback is disabled during recording, during playback and recording, or not at all.

NOTE

Set the Talkback DIM level to 0 dB so as not to radically change the mix level when punching in and out of record mode.

Use Phones Channel as Preview Channel

When this is activated, the Phones channel will be used for monitoring. When this is deactivated, the Monitor channel in the Control Room will be used.

Dim Cue during Talkback

When this option is activated, the cue mix heard in a studio will be dimmed (by the amount set in the Talkback Dim Level field in the Control Room) for as long as the Talkback channel is used. When this option is deactivated, the cue mix level remains the same during Talkback.

Exclusive Device Ports for Monitor Channels

When activated, the port assignment for Monitor channels is exclusive. If your scenario does not require you to assign ports to several Monitor channels, it is recommended to activate this option. This way you can make sure that you do not accidentally assign ports to inputs/outputs and Monitor channels at the same time.

NOTE

This setting is saved with the Control Room presets.

Reference Level

The reference level is the level that is used in calibrated mixing environments, such as film dubbing stages. Use this option to specify the reference level that can be assigned to the Control Room level.

NOTE

You can also manually adjust the reference level in the Control Room settings.

Main Dim Volume

Use this to set the amount of gain reduction applied to the Control Room channel when the DIM button is activated.

VariAudio

Inhibit warning when changing the Sample Data

When you are modifying audio material that is used in several places in the project in the Sample Editor, a warning message is shown. This message can be deactivated: If you activate the **Please, don't ask again** checkbox, the message will not be displayed in the future (when editing the pitch or time of audio material that is used several times in one project).

To display this message again, and thus be informed whether the audio is used in other places, deactivate this option.

Inhibit warning when applying Offline Processes

When you are applying offline processes (e.g. with the Envelope or Normalize functions) to audio material that is used in several places in the project, a warning message is shown. This message can be deactivated: If you activate the **Please, don't ask again** checkbox, the message will not be displayed in the future.

To display this message again, and thus be informed whether the audio is used in other places, deactivate this option.

Video

Extract Audio on Import Video File

If this option is activated and you import a video file, the audio data of the video is automatically extracted and saved as a separate audio clip.

Thumbnail Memory Cache Size

The value entered here determines how much memory is available for displaying thumbnails. The currently shown image of a video is buffered in the thumbnail memory cache. Whenever you move to another image and there is no memory capacity left, the "oldest" picture in the cache is replaced by the current one. If you have long video clips and/or work with a large zoom factor, you may have to raise this value.

Part II - Score Layout and Printing (NEK only)

How the Score Editor works

About this chapter

In this chapter you will learn:

- How the Score Editor and MIDI data relate.
- What Display Quantize is and how it works.

Welcome!

Welcome to scoring in Nuendo! The Score Editor has been created to allow you to get any possible piece of music displayed as a score, complete with all the necessary symbols and formatting. It allows you to extract parts out of a full orchestra score, to add lyrics and comments, create lead sheets, score for drums, create tablature, etc. In other words: just about any type of notation you could ever desire!

There are a few basic principles to how the Score Editor works, which you have to understand to make full use of it.

How the Score Editor operates

The Score Editor does the following:

- Reads the MIDI notes in the MIDI parts.
- Looks at the settings you have made.
- Decides how the MIDI notes are displayed according to the settings.

The Score Editor takes MIDI data and settings as input and produces a score as output.

The Score Editor does all this in realtime. If you change some of the MIDI data (for example by moving or shortening a note) this is immediately reflected in the score. If you change some of the settings (for example the time signature or key signature) this is also immediately apparent.

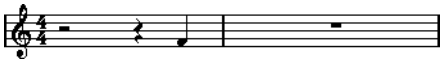
Do not think of the Score Editor as a drawing program, but rather as an “interpreter” of MIDI data.

MIDI notes vs. score notes

MIDI tracks in Nuendo hold MIDI notes and other MIDI data. As you may know, a MIDI note in Nuendo is only defined by its position, length, pitch and velocity. This is not nearly enough information to decide how the note is to be displayed in a score. The program needs to know more: What type of instrument are we talking about, Drums? Piano? What key is the piece in? What is the basic rhythm? How should the notes be grouped under beams? You provide this information by making settings and working with the tools available in the Score Editor.

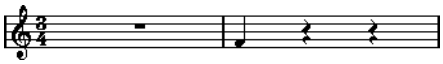
An example of the MIDI/score relationship

When Nuendo stores a MIDI note’s position, it makes the measurement in an absolute value, called ticks. There are 480 ticks to a quarter note. Have a look at the example below:



A quarter note at the end of a 4/4 measure

The note is on the fourth beat of the measure. Now, let’s say you change the time signature to 3/4. This shortens the length of a “measure” to only three quarter notes – 1440 ticks. Suddenly our quarter note is in the next measure:



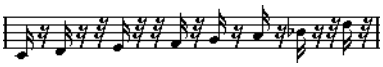
The same note in 3/4

Why? Since you are not changing the MIDI data in the track/part (that would ruin your recording!) by changing the time signature, the note is still at the same absolute position. It is just that now each “measure” is shorter, which effectively moves the note in the score.

What we are trying to get across here is that the Score Editor is an “interpreter” of the MIDI data. It follows rules that you set up by making settings in dialogs, on menus, etc. And this interpretation is “dynamic”, or in other words, it is constantly updated whenever the data (the MIDI notes) or the rules (the score settings) change.

Display Quantize

Let's say you used the Project window to record a figure with some staccato eighth notes. When you open the Score Editor, these notes are displayed like this:



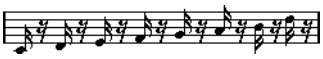
This does not look anything like what you intended. Let's start with the timing – obviously, you were off at a couple of places (the third, fourth and last note all seem to be a 32nd note late). You can solve this by quantizing the figure, but this would make the passage sound too "stiff", and not fit in the musical context. To resolve this problem the Score Editor employs something called "Display Quantize".

Display Quantize is a setting which is used to tell the program two things:

- How precise the Score Editor is to be when displaying the note positions.
- The smallest note values (lengths) you want displayed in the score.

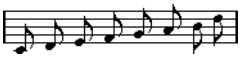
In the example above, the Display Quantize value seems to be set to 32nd notes (or a smaller note value).

Let's say we change the Display Quantize value to sixteenth notes in the example:



With Display Quantize set to sixteenth notes

OK, now the timing looks right, but the notes still do not look like what you intended. Maybe you can understand that from a computer's point of view, you did play sixteenth notes, which is why there are a lot of pauses. But that's not how you meant it. You still want the track to play back short notes, because it is a staccato part, but you want something else "displayed". Try setting the Display Quantize value to eighth notes instead:



With Display Quantize set to eighth notes

Now we have eighth notes, as we wanted. All we have to do now is to add staccato articulation which can be done with one simple mouse click using the Draw tool or using musical articulations.

How did this work? By setting the Display Quantize value to eighth notes, you give the program two instructions that would sound something like this in English: "Display all notes as if they were on exact eighth note positions, regardless of their actual positions" and "Don't display any notes smaller than eighth notes, regardless of how short they are". Please note that we used the word "display", which leads us to one of the most important messages of this chapter:

IMPORTANT

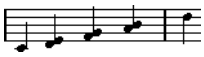
Setting a Display Quantize value does not alter the MIDI notes of your recording in any way, as regular quantizing does. It only affects how the notes are displayed in the Score Editor (and nowhere else)!

RELATED LINKS

Working with symbols on page 1402
Expression maps (NEK only) on page 854

Choose your Display Quantize values with care

As explained above, the Display Quantize value for notes puts a restriction on the smallest note value that can be displayed. Let's see what happens if we set it to quarter notes:



With Display Quantize set to quarter notes

Oops, this doesn't look too good. Well of course it doesn't! We have now instructed the program that the "smallest" note that occurs in the piece is a quarter note. We have explicitly told it that there are no eighth notes, no sixteenths, etc. So when the program draws the score on screen (and on paper) it quantizes the display of all our eighth notes to quarter note positions, which makes it look like above. But again, please note that when you hit Play, the passage still plays as it originally did. The Display Quantize setting only affects the score image of the recording.

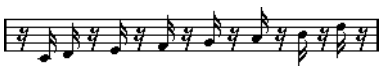
IMPORTANT

Even if you manually enter notes in the score using perfect note values, it is very important that you have your Display Quantize settings right! These values are not just used for MIDI recordings! If you for example set the Display Quantize value for notes to quarter notes and start clicking in eighth notes, you get eighth notes in the track (as MIDI data), but still only quarter notes in the display!

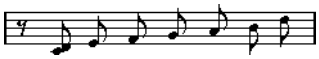
Using Rests as Display Quantize setting

Above we used Display Quantize for notes. There is a similar Display Quantize setting called "Rests" which is used to set the smallest rest to be displayed. Often, this setting is very effective.

Let's start with the following note example:

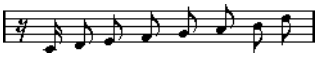


As you see, the first note appears one sixteenth note late. If we change the Display Quantize value for notes to eighth notes, the score is displayed like this:



With Display Quantize: Notes set to eighth notes

Unfortunately, this moves the first note to the same position as the second, since sixteenth note positions are not allowed. We can solve this by inserting extra Display Quantize values within the bar with the Display Quantize tool, but there is a much easier way: Change the Display Quantize value for notes back to sixteenths, but set the value for rests to eighth notes! This tells the program not to display any rests smaller than eighth notes, except when necessary. The result looks like this:



With Display Quantize: Notes set to sixteenth notes, but Rests set to eighth notes.

How did this work? Well, you instructed the program not to display any rests smaller than eighth notes, except when “necessary”. Since the first note appeared on the second sixteenth note position, it was necessary to put a sixteenth rest at the beginning of the figure. All other rests can be hidden by displaying the notes as eighth notes, and were therefore not “necessary”.

This leads us to the following general guidelines:

- Set the Notes value according to the “smallest note position” you want to be shown in the score (e.g. if you have notes on odd sixteenth note positions, set the Notes to sixteenth notes).
- Set the Rests value according to the smallest note value (length) you want to be displayed for a single note, positioned on a beat.

  Common Display Quantize settings would be to have Notes set to 16 (sixteenth notes) and Rests set to 4 (quarter notes).

RELATED LINKS

Inserting Display Quantize changes on page 1318

Handling exceptions

Unfortunately, the guidelines above do not work perfectly in every situation. You may for example have a mix of straight notes and tuplets of different types, or you may wish to display equally long notes with different note values depending on the context. There are several methods you can try:

Automatic Display Quantize

If your score contains both straight notes and triplets, you can use Auto Quantize. When this is activated, Nuendo tries to “understand” whether the notes should be display quantized to straight notes or triplets.

RELATED LINKS

If your music contains mixed straight notes and triplets on page 1353

Using the Display Quantize tool

With the “Q” tool, you can insert new Display Quantize values anywhere in the score. Inserted Display Quantize values affect the staff from the insertion point onwards.

RELATED LINKS

Inserting Display Quantize changes on page 1318

Permanent alteration of MIDI data

As a last resort, you can resize, quantize or move the actual note events. However, this would result in the music not playing back like it originally did. Often it is possible to get the score to look the way you want without altering any MIDI data.

Summary

This closes our discussion on the basic concept of display quantizing. There are a number of other special situations which require more advanced techniques described in the next chapters. The interpretation options which work along the same lines as Display Quantize are also explained.

Entering notes by hand vs. recording notes

Sometimes you enter and edit notes by hand (or rather using the mouse and/or the computer keyboard) and at other times you record them from a MIDI keyboard. Most of the time, you do a combination of both. In real life, even if you have recorded the piece perfectly, you often have to do some permanent editing to your recording before printing.

RELATED LINKS

Transcribing MIDI recordings on page 1315
Entering and editing notes on page 1323

The basics

About this chapter

In this chapter you will learn:

- How to open the Score Editor.
- How to switch between Page Mode and Edit Mode.
- How to set up the page size and margins.
- How to hide and show the Symbols Inspector, the toolbar, and the extended toolbar.
- How to set up the ruler.
- How to set a zoom factor.
- How to make initial settings for clef, key, and time signature.
- How to transpose instruments.
- How to print and export your score.

Preparations

PROCEDURE

1. In the Project window, create a MIDI track for each instrument.

   You can prepare a piano (split) staff from a single track, i.e. there is no need to create one track for the bass clef and one for the treble clef.

2. Name each track after the instrument.

   This name can later be used in the score if you like.

3. Record on the tracks or create empty parts on all tracks.

   You can make very long parts that cover the entire project, or you can start out with shorter parts to begin with. If you choose the latter option, you can always go back later and add new parts or copy existing parts.

Opening the Score Editor

Editing one or several parts

To open one or several parts in the Score Editor, select the parts (on the same or on different tracks) and select “Open Score Editor” from the MIDI menu or “Open Selection” from the Scores menu. The default key command for this is [Ctrl]/[Command]-[R].

- You can also select the Score Editor as your default editor, allowing you to open it by double-clicking parts.

  This is done with the Default Edit Action pop-up menu in the Preferences dialog (Event Display–MIDI page).

Editing whole tracks

When preparing a score for printing, you probably want to open whole MIDI tracks in the Score Editor. To do this, select the track(s) in the track list and make sure no parts are selected – then open the Score Editor as described above.

Editing parts on different tracks

If you have selected parts on two or more tracks (or several entire tracks – no parts) and open the Score Editor, you get one staff for each track (although you can split a staff in two, e.g. when scoring for piano). Think of the Project window as an overview of your entire score and the tracks as representing one instrument each.

Editing predefined combinations of tracks

You can open the Score Editor for a certain combination of tracks that you edited before.

RELATED LINKS

Layout operations on page 1468

Displaying single voices or the complete score

When the Double-click on staff flips between full score/part option is activated in the Preferences dialog (Scores–Editing page), double-clicking on the blue rectangle to the left of a staff switches between display of either the whole score or the current voice.

The project cursor

The project cursor appears as a vertical line across the staff. When you open the Score Editor, the view is automatically scrolled so that the project cursor is visible in the window. This means you do not always see the beginning of the edited part when you first open the Score Editor.

- Hold down [Alt]/[Option] and [Shift] and click anywhere in the score to move the project cursor there.

  This is handy when the project cursor is not visible. This is not possible if Computer Keyboard Input mode is activated.

RELATED LINKS

Entering notes using the computer keyboard on page 1328

Playing back and recording

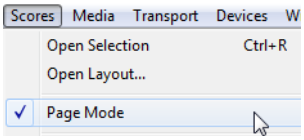
You can play back and record MIDI in the Score Editor using the standard transport commands, just like in the other MIDI editors.

RELATED LINKS

MIDI Editors on page 777

Page Mode

When you are preparing a score for printout, you should set the Score Editor to Page Mode. This is done by selecting Page Mode from the Scores menu. When Page Mode is activated, a checkmark appears next to this menu option.



In Page mode, the window switches to display one page at a time, as it appears on printout.

Page Mode vs. Edit Mode

When Page Mode is not activated, the Score Editor is in Edit Mode. All you can do in Edit Mode, you can also do in Page Mode. But Page Mode offers lots of additional features which are directly related to how the score is displayed and printed.

IMPORTANT

This section of the manual assumes you are in Page Mode. It is mentioned explicitly if something in this text specifically relates to Edit Mode.

Changing the Background in Page Mode

In Page Mode, you can specify different background textures for the score by selecting an option from the Background Texture pop-up menu on the toolbar.

NOTE

The background texture only affects the display and is not used for printing.

Using the scrollbars in Page Mode

In Page Mode, the scrollbars are used to scroll the image of the page inside the window.

Moving between pages in Page Mode

If your score takes up more than one page, you use the page number indicator in the lower right corner to move to another page in your score. The number can be adjusted using the standard editing techniques.

The page number indicator – adjust it to move to another page.

Also, if Auto-Scroll is activated on the toolbar, the score display follows the project cursor position. This way you can scroll the score by using fast forward or rewind.

Editing individual parts in Page Mode

When you view a single part in Page Mode, the bars before and after the part is normally shown as empty measures in the Score Editor. This is to preserve the layout of the track, i.e. the spacing between staves and bar lines, number of bars per staff, etc.

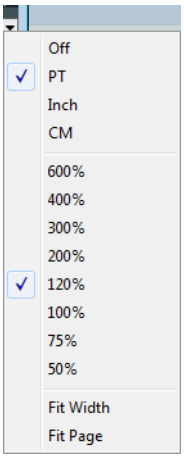
If you want to view and print a single part, without any surrounding empty bars, activate the “Unlock Layout when editing single parts” option in the Preferences dialog (Scores–Editing page). Note, however, that if you adjust the layout when editing the part in this mode, this erases the layout for the whole track!

Changing the zoom factor

There are two ways to change the zoom in Page Mode: by setting a zoom factor on the zoom pop-up menu or by using the Zoom tool (magnifying glass).

Using the Zoom pop-up menu

Above the vertical scrollbar to the right you can find a pop-up menu allowing you to set the zoom factor.



By zooming in you can make detailed adjustments to symbols, etc. By zooming out you get a better overview.

- If you select “Fit Page”, the zoom factor is adjusted according to the window size so that the whole page becomes visible.
- If you select “Fit Width”, the zoom factor is adjusted according to the window width so that the full width of the page becomes visible.

NOTE

This pop-up menu can also be opened by right-clicking in the ruler.

Using the Zoom tool

The Zoom tool in the Score Editor works much like in the Project window:

- Click once with the Zoom tool to zoom in one step.
- Hold down [Alt]/[Option] and click once with the Zoom tool to zoom out one step.
- Drag a rectangle with the Zoom tool to set a custom zoom factor.

  The section encompassed by the rectangle is zoomed to fill the window.

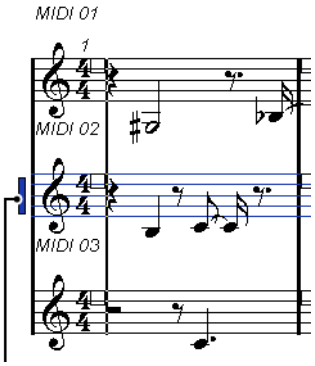
- Hold down a modifier key and right-click with the Zoom tool to open the Zoom context menu, and select the desired Zoom setting.

Using the Mouse wheel

You can also zoom by holding down [Ctrl]/[Command] and moving the mouse wheel. The mouse position is kept (if possible) when zooming in or out.

The active staff

One thing to note when you are working with multiple staves is the “active” staff. Only one staff at a time can be active, and it is indicated by a blue rectangle to the left of the clef symbol.



This staff is active.

NOTE

To make a staff active, click anywhere on it. By default, you can also use the up and down arrow keys on the computer keyboard to step between staves.

Making page setup settings

Before preparing the score for printout, you have to make some page settings for your project. This does not have to be the first thing you do, but it is a good working habit, because it also affects the on-screen display of the score.

PROCEDURE

1. On the File menu, select Page Setup.

   The Page Setup dialog appears. This is the regular operation system Page Setup dialog, described in detail in your system’s documentation. The only things that Nuendo adds to this are the margin settings.

2. Select the preferred printer, paper size, orientation, etc.

3. If you need to, change the margins by setting the left, right, top and bottom settings.

   To make the settings permanent, save the project.

   If you want new projects to always start with certain page setup settings, you can create project templates.

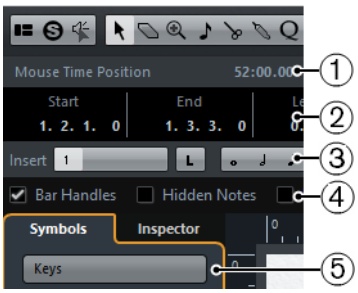
RELATED LINKS

Saving a Project Template File on page 72

Designing your work space

You can design your work space according to your needs by showing/hiding different areas using the Window Layout function and by showing/hiding different options of these areas using the Setup options dialogs. Which areas and options to show or hide depends on what kind of project you are working on, how large your monitor is, and so on.

Window layout

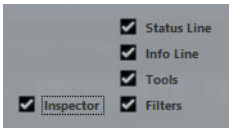


1) Status line
2) Info line
3) Extended toolbar
4) Filter bar
5) Symbols Inspector

Configuring the window layout

PROCEDURE

1. On the toolbar, click the “Set up Window Layout” button.



2. Activate the desired options.

The status line

The status line features the Mouse Time and the Mouse Note Position displays as well as the Current Chord Display, which helps you identify chords in the Score Editor note display. It can be hidden/displayed using the “Status Line” option in the “Set up Window Layout” pane.

The status line has its own Setup dialog where you can specify exactly which properties you want to see.

- Right-click on the status line and select “Setup…” from the context menu.

  In the dialog that appears you can configure where the separate items will be placed and save/recall different setup configurations.

The info line

The info line displays information about the selected note. It can be shown and hidden using the “Info Line” option in the “Set up Window Layout” pane.

The info line has its own setup dialog where you can specify exactly which properties are shown.

- Right-click on the info line and select “Setup…” from the context menu.

  In the dialog that appears you can configure where the separate items will be placed and save/recall different setup configurations.

The extended toolbar

The extended toolbar contains additional tools four your score. It can be hidden/displayed using the Tools option in the “Set up Window Layout” pane.

The filter bar

This area contains checkboxes determining which indicators, handles, and other non-printed elements are shown in the score. It can be hidden/displayed using the Filters option in the “Set up Window Layout” pane.

Showing and hiding elements

Some of the elements in the score are not printed, but rather serve as indicators for layout changes, handles, etc. These elements can be hidden or shown in any combination by using the Filters options.

The following options are available:

Bar Handles

Displays the bar handles, used for copying bars.

Hidden Notes

Displays any notes you might have hidden.

Hide

Displays markers in the score for each hidden element (except notes).

Quantize

Displays markers in the score where you have made Display Quantize “exceptions”.

Layout Tool

Displays markers in the score where you have made adjustments with the Layout tool.

Grouping

Displays markers in the score where you have made beam groupings.

Cutflag

Displays markers in the score where you have inserted cutflag events.

Split Rests

Displays markers in the score wherever you have split multiple rests.

Stems/Beams

Displays markers in the score where you have made any stem or beam adjustments.

RELATED LINKS

Moving and duplicating with the bar handles on page 1425
Hiding/showing objects on page 1480
Inserting Display Quantize changes on page 1318
Graphic moving of notes on page 1394
Grouping on page 1384

The Cut Notes tool on page 1393
Splitting multi-rests on page 1483
Setting stem direction on page 1374
Manual adjustment of beams on page 1391

The Symbols Inspector

This area contains symbol tabs, which are used to add symbols to the score. It can be hidden/displayed using the Symbols option in the “Set up Window Layout” pane.

The symbol tabs can also be opened as free-floating palettes by opening them, right-clicking any of the buttons and selecting “Open as Palette” from the context menu. This way you can move symbol palettes around on the screen by clicking and dragging their title bars. Right-clicking on a symbol palette brings up a pop-up menu:

- Select “Toggle” to switch between a vertical or horizontal view of the palette.
- Select one of the options on the pop-up menu to bring up the corresponding palette instead of the current palette.
- Hold down [Ctrl]/[Command] and select a palette from the pop-up menu to open the selected palette in a new window (without closing the existing one).
- Click the close button to close a symbol palette.

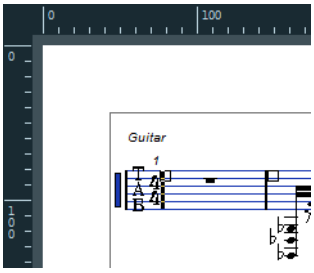
In the Symbols Inspector setup dialog you can specify exactly which symbol tabs are shown.

RELATED LINKS

The Symbols Inspector Setup dialog on page 1404
Working with symbols on page 1402

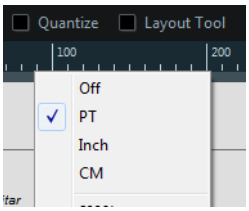
The ruler

In the Score Editor there are no meter/time position rulers as in the other editors. Instead, there are horizontal and vertical “graphic rulers” in Page Mode. These help you to position symbols and graphical objects in the score.



- To specify which units to show on the rulers, open the Zoom pop-up menu and select one of the options.

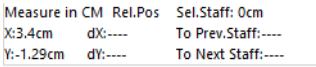
  You can choose between points, inches, and centimeters.



- To hide the rulers, select “Off” from the pop-up menu.

The Position Info window

To help you when positioning objects in the score, the Page Mode has a special Position Info window, in which you can view and adjust object positions numerically, in the unit selected for the ruler. To display the Position Info window, click in the ruler.



About the Score Editor context menus

Many functions and settings of the Score Editor can be accessed via context menus, opened by right-clicking on certain elements of the score. For example, if you choose a note, the note context menu opens, listing note-related functions.

If you open the context menu on an empty area of the score, it lists all available tools (allowing you to quickly switch between tools) and it contains many functions of the main menus.

About dialogs in the Score Editor

There are two types of dialogs available in the Score Editor:

- Non-modal dialogs can remain open while you continue working in the score.

  In a non-modal dialog, clicking the Apply button applies the settings in the dialog to the selected objects in the score. This means you can select different elements in the score and change their settings, without having to close the dialog in between.

  The dialog is closed by clicking the standard close button in the window title bar. The Score Settings dialog is an example for a non-modal dialog.

- Regular dialogs have an OK button instead of an Apply button.

  Clicking OK applies the settings you have made and closes the dialog. You cannot continue working in the score (or select other objects) until you close the dialog.

NOTE

If the “Apply closes Property Windows” option is activated in the Preferences dialog (Scores–Editing page), clicking the Apply button in a non-modal dialog closes the dialog. In other words, this makes a non-modal dialog work a bit more like a regular dialog.

Setting clef, key, and time signature

When preparing to enter notes into a score, you probably want to start out by setting the desired clef, key, and time signature for the staff. The text below assumes you are working on one track only. If you have multiple staves, you either make this setting independently for each staff or for all staves at once.

Normally, all these symbols appear at the beginning of each staff. However, you can control this by using the Real Book option and by hiding objects.

When entering or editing keys, there is one important thing to note:

IMPORTANT

In the Score Settings dialog on the Project–Notation Style subpage (Keys category) you can find the “Key Changes for the entire Project” option. When this option is activated, all changes made to the key always affect every staff in the project, i.e. it is not possible to define different keys for different staves.

RELATED LINKS

Staff settings on page 1348
Real Book on page 1478
Hiding/showing objects on page 1480

Using the Symbols Inspector to set the initial clef, key, and time signature

PROCEDURE

1. Click the “Set up Window Layout” button on the toolbar and activate the Symbols option.

   The Symbols Inspector is displayed.
2. Open the Clefs tab of the Inspector and click on the symbol for the clef that you want to use in your score.
3. Click anywhere in the first bar of the staff to set the clef for this track.
4. Select the Keys tab and click on the symbol for the key that you want to use.
5. Click anywhere in the first bar of the staff to set the key for the track.

6. Open the Time Signature tab of the Inspector and click on the symbol for the time signature value that you want to use.

   If you cannot find the desired time signature, you can use the Edit Time Signature dialog (see below).

After Completing This Task

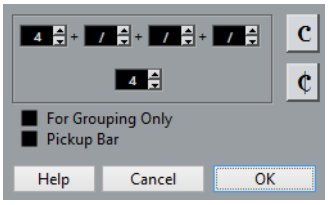
The settings you have made so far are valid for the entire track. If you want to further edit these settings, or if you need different settings for different bars of your track, proceed as described in the next section.

Editing the time signature

Procedure

1. Double-click on the time signature symbol at the beginning of the staff.

   A dialog opens.



2. If the project is in 4/4 or 2/2, you can select common time/cut time directly by clicking one of the two symbols on the right.

   This sets the time signature to 4/4 or 2/2, respectively and also inserts a common/cut time symbol on the staff.

3. If the project is in any other time, set the numerator and denominator above and below the line, respectively.

   The numerator can consist of several numbers for composite time signatures. However, if the project is in a simple time signature you only need to fill in the first number above the line. The more advanced options are described below.

4. Click OK or press [Return].

   Important

   All tracks share the time signature! In other words, when you set the time signature, you do this for all tracks in the project.

   If you need to enter half a bar somewhere (for example) you have to make a time signature change (e.g. from 4/4 to 2/4 and back again).

RELATED LINKS

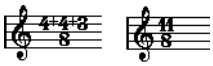
By using the Pickup Bar feature on page 1485
Inserting and editing clefs, keys, or time signatures on page 1344

Composite time signatures and the For Grouping Only option

For composite signatures, the numerator can be made up of up to four groups. For example, “4+4+3+/” on the upper line and 8 on the lower means the time signature is 11/8.

The reason for dividing the numerator into several numbers is to get beaming and tied notes displayed correctly automatically. This does not affect the metronome or anything else, only beams and ties.

If “For Grouping Only” is not activated, the numerator shows all the numbers entered. If it is activated, it shows the sum of the numbers entered, as for “simple” time signatures.



“For Grouping Only” off and on

Note that Nuendo tries to preserve the denominator when you insert a composite signature with “For Grouping Only” activated. This means that if you have a 4/4 time signature, and change it to a composite value (3+3+2 eighths for example), the time signature still is displayed as 4/4 instead of 8/8.

RELATED LINKS

Handling beaming on page 1384

Setting the time signature on the Transport panel

You can also set the time signature directly on the Transport panel. Please note that you cannot create composite time signatures from the Transport panel.

Setting the time signature using the signature track/Tempo Track Editor

You can also add, edit and delete time signatures using the signature track or the Tempo Track Editor.

Please note the following:

- The score always shows the time signature events set in the signature track/Tempo Track Editor, regardless of whether or not the Tempo button is activated. Likewise, any time signatures you create in the Score Editor are shown in the signature track/Tempo Track Editor.

- You cannot create composite time signatures using the signature track/Tempo Track Editor.

RELATED LINKS

Editing tempo and signature on page 980

Editing the clef

On the clef context menu

When you right-click on a clef symbol, a context menu with a list of all available clefs opens. This menu also contains the following options:

- Display Clef Changes as Small Symbols

  If you activate this option and insert a clef change in the score, the clef is displayed with a smaller symbol.

- Warnings for new Clefs at Line Breaks

  If you activate this option and insert a new clef at a line break, the Clef change symbol is inserted in the last bar before the staff break. When this is deactivated, the symbol is inserted in the first bar of the next staff line.

- Hide

  If you select this function, the clef is hidden.

- Properties

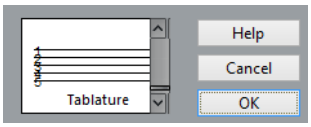
  If you select this function, the Edit Clef dialog opens.

In the Edit Clef dialog

PROCEDURE

1. Double-click on the current clef.

   A dialog appears.

2. Use the scrollbar to select a clef.

   IMPORTANT

   This does not work if Auto Clef is activated on the Staff page of the Score Settings dialog, see below.

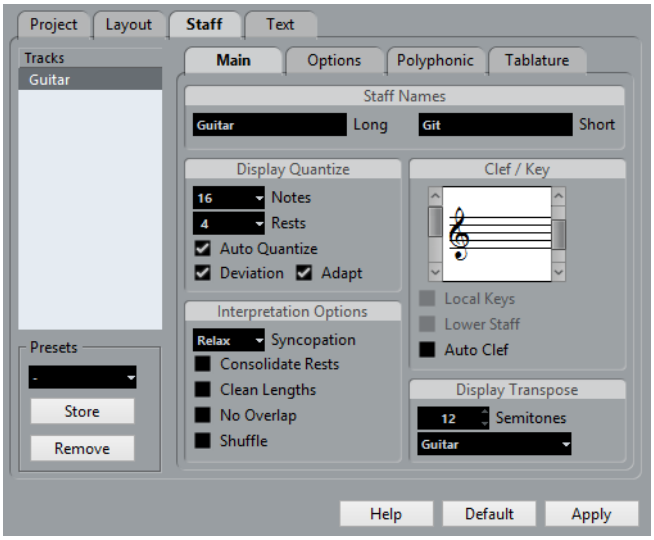
3. Repeat the steps above for all staves in the system.

On the Staff page of the Score Settings dialog

PROCEDURE

1. Click on a staff to make it the active staff.
2. On the Scores menu, select “Settings…” to open the Score Settings dialog. Select the Staff page at the top to open the Main tab, showing the current settings for the active staff.

   You can also double-click to the left of a staff to make it active and bring up the Score Settings dialog in one go (if this does not work, the “Double-click on staff flips between full score/part” option in the Preferences dialog (Scores–Editing page) may be activated.



3. In the Clef/Key section, use the scrollbar on the left to select one of the available clefs.
4. Click Apply.

NOTE

You can select another staff in the score and make settings for it without having to close the Score Settings dialog first.

RELATED LINKS

Displaying single voices or the complete score on page 1293
Inserting and editing clefs, keys, or time signatures on page 1344

In a split system

If you have a split system you can set different clefs for the upper and lower staff.

PROCEDURE

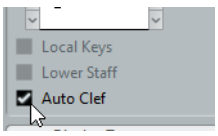
1. Open the Score Settings dialog on the Staff page.
2. Select a clef for the upper staff.

3. Activate the “Lower Staff” checkbox.
4. Set a clef for the lower staff.

RELATED LINKS

Split (piano) staves on page 1342
Strategies: How many voices do I need? on page 1364

Using Auto Clef



On the Staff page of the Score Settings dialog you also find the Auto Clef option. If this is activated, the program automatically selects a treble clef or a bass clef for the staff, depending on the range of the notes in the part.

Editing the key

IMPORTANT

In the Score Settings dialog on the Project–Notation Style subpage (Keys category), you can find the “Key Changes for the entire Project” option. When this is activated, all changes made to the key always affect every staff in the project, i.e. it is impossible to define different keys for different staves (other than the relative display transpose settings for instruments made on the Staff page). Furthermore, on the Staff page, any staff (e.g. a drum staff) can be set to not show key signatures.

Therefore, when you want to edit the key, decide if you want the key change to apply to the entire project, or if you want to use different keys on different staves:

- If the key set at the beginning of the track is to be used on all staves, and if any subsequent key changes are also valid for all staves, then leave the “Key Changes for the entire Project” option activated.
- If you want to use different keys on different staves, make sure that the “Key Changes for the entire Project” option is deactivated.

On the key context menu

When you right-click on a key symbol, a context menu with a list of all available keys opens. This menu also contains the following options:

- Key Changes for the entire Project

  If this option is activated, all changes made to the key always affects the entire project, so that it is not possible to define different keys for different staves.

- Hide

  If you select this, the key is hidden.

- Properties

  If you select this, the Edit Key dialog opens.

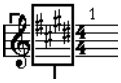
In the Edit Key dialog

If the current key is anything but C major/A minor (no accidentals), you can set the key directly in the score:

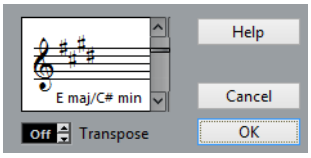
PROCEDURE

1. Double-click on the accidentals at the beginning of a staff.

   The "Edit Key" dialog opens.

   Double-click here…

   …to open the Edit Key dialog.

2. Use the scrollbar to select a key and click OK.

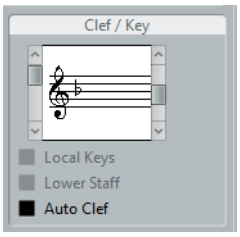
RELATED LINKS

Transposing instruments on page 1311

On the Staff page of the Score Settings dialog

PROCEDURE

1. Make the desired staff active, open the Score Settings dialog and select the Staff page.

   The Clef/Key section on the Staff page

2. Use the right scrollbar in the Clef/Key section to select the desired key.

3. Click Apply.

NOTE

You can select other staves in the score and make settings for these, without having to close the Score Settings dialog.

Setting the key for a split system

If you have a split system with two staves you can set different keys for the upper and lower staff.

PROCEDURE

1. Click in the system to make one of its staves the active staff.
2. Open the Score Settings dialog on the Staff page.
3. Set a key for the upper staff.

   This automatically sets the lower staff to the same key.
4. If you need to set a different key for the lower staff, activate the “Lower Staff” checkbox and set a key for this.

RELATED LINKS

Split (piano) staves on page 1342
Strategies: How many voices do I need? on page 1364

Setting a local key

You can also set a different key for the selected staff only. This is useful for instruments like oboe and English horn that change display transpose and therefore also the key.

PROCEDURE

1. Make the desired staff active, open the Score Settings dialog and select the Staff page.
2. Activate the “Local Keys” option on the Main subpage in the Clef/Key section.

   NOTE

   This option is only available if “Key Changes for entire Project” is activated in the Score Settings dialog, on the Project–Notation Style subpage (Keys category).
3. Use the scrollbar to the right to set the desired key.
4. Click Apply to set the selected key for the staff.

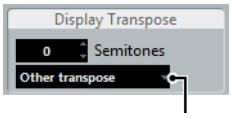
Transposing instruments

Scores for some instruments, for example a lot of brass instruments, are written transposed. Therefore, the Score Editor provides a Display Transpose function. With this function notes are transposed in the score without affecting the way they are played back. This allows you to record and play back a multi-staff arrangement, and still score each instrument according to its own transposition.

Setting Display Transpose

PROCEDURE

1. Make the desired staff active, open the Score Settings dialog and select the Staff page.
2. In the Display Transpose section, select your instrument from the Transpose pop-up menu or adjust the value directly in the Semitones field.



Transpose pop-up menu

3. Click Apply.

IMPORTANT

Display Transpose does not affect MIDI playback!

Display Transpose in the Edit Key dialog

If you want to change the Display Transpose setting in the middle of the score, you can do this by inserting a key change. In the Edit Key dialog, which is opened by double-clicking a key symbol, you can find a Transpose field, in which you can enter a transposition value in semitones. This is useful if you are for example writing a saxophone part and want the player to switch from alto to tenor saxophone.

NOTE

Note that you enter an absolute Display Transpose value that is used from this point on. In other words, this setting is not relative to any Display Transpose settings you made on the Staff page of the Score Settings dialog.

RELATED LINKS

Inserting and editing clefs, keys, or time signatures on page 1344

Disabling Display Transpose

You can also disable Display Transpose by deactivating the “Display Transpose” button on the Score Editor toolbar. This can be useful if you work with transposing instruments and want to show the concert key and not the scored key.

Printing from the Score Editor

When you have made all necessary changes to the score display and are satisfied with the result, you can go ahead and print your score, e.g. to hand out note sheets.

PROCEDURE

1. On the Scores menu, activate “Page Mode”.
   Printing is only possible from within Page Mode.
2. Select Page Setup from the File menu and make sure all your printer settings are correct. Close the dialog.

   IMPORTANT

   If you change your setting for paper size, scale, and margins now, the score may change its look.
3. Select Print from the File menu.
4. A standard print dialog appears. Fill out the options as desired.
5. Click Print.

Exporting pages as image files

You can export a section of a page or a complete page in various file formats. This allows you to import your scores into desktop publishing and drawing applications.

Selecting a section of a page for exporting

If you only want to export a part of a certain page, proceed as follows:

PROCEDURE

1. Make sure that you are in Page Mode.
2. Select the Export tool (“Select Export Range”).
   The pointer turns into a cross-hair cursor.

3. Drag over the section of the score you want to include.

   The area is indicated by a black rectangle

   - You can adjust the size of the rectangle by clicking and dragging its handles with the Object Selection tool.
   - You can move the rectangle to another position in the score by clicking and dragging.

   To export the selected range, you have two possibilities:

   - Double-click inside the rectangle while it is selected.

     This opens the Export Scores dialog, where you can make settings for the file to be created (see below).
   - Use the Export Scores function, see below.

Exporting

To export the score, proceed as follows:

PROCEDURE

1. Make sure that you are in Page Mode.
2. Select the page that you want to export.
3. Open the File menu, open the Export submenu and select “Export Scores…”.

   The Export Scores dialog appears.
4. Select a picture format.
5. Specify a resolution for the file.

   This determines the accuracy with which the image is created. 300 dpi, for example, is the resolution many laser printers use for printing. If the image file is only displayed on screen in other programs, select 72 or 96 (depending on screen resolution) and it has the same size as it had in Nuendo.
6. Specify name and location for the file and click Save.

   The page of the score is exported and saved as a file. It can now be imported into any program supporting the selected file format.

Working order

When you prepare a score, we suggest you do things in the following order, since this minimizes the time needed if you make a mistake somewhere and need to redo a step.

- Preferably work on copies of recorded tracks.

  If the parts are fairly complex you might have to change them permanently, after which they do not play back as they originally did.

- If memory is an issue, break the score up into segments.

You might for example use the Split Loop function from the Functions submenu on the Edit menu to split the parts across all tracks.

- Arrange the tracks in the Project window in the order you want them displayed in the score.

  You cannot rearrange the order of systems in the Score Editor. However, you can go back and change the order in the Project window at any time.

- When opening the Score Editor, begin with the adjustments described above.

  You should always begin by setting page margins, etc.

- If you have recorded music into tracks already, try adjusting the graphic display of the score as much as possible without permanently editing the notes.

  Use the Score Settings, Display Quantize, Grouping, etc.

- If the tracks are empty, make basic staff settings, enter the notes and then make detailed adjustments, add Display Quantize, etc.
- If needed, use polyphonic voicing to resolve overlapping notes, create piano systems, handle crossing voices, etc.
- When all this is done, decide if you need to perform “destructive” editing.

  You might for example have to permanently alter the length or position of some of the recorded notes.

- Hide unwanted objects and add note-dependent and note-related symbols.

  This includes accents, dynamic symbols, crescendo, slurs, lyrics, “graphic rests”, etc.

- Work through the score and adjust the number of bars across the page.
- Adjust the vertical spacing between staves and grand staves.

  The last two steps can be performed automatically by the program using the Auto Layout features.

- Add layout symbols like endings, page text, etc.
- Print or export the score.
- Go back and create alternative layouts, e.g. to extract voices.

Force update

If for some reason the screen is not redrawn properly (as a result of the computer’s recalculation of the appearance of the page), you can select “Force Update” from the Functions submenu on the Scores menu or click the Force Update button on the extended toolbar. This forces a redraw of the whole page.

Transcribing MIDI recordings

About this chapter

In this chapter you will learn:

- How to prepare your parts for score printouts.
- How to use the Display Quantize tool to handle “exceptions” in the score.
- How to resolve parts that contain mixed notes and triplets.

About transcription

This chapter assumes you have a MIDI recording that you want to transform into a printable score. However, if the parts are fairly complicated, you probably need to perform some manual editing of the notes.

IMPORTANT

Before starting, make sure that you understand the basic principles behind the score notes/MIDI notes relationship and also what Display Quantize is.

RELATED LINKS

Entering and editing notes on page 1323
How the Score Editor works on page 1286

Getting the parts ready

PROCEDURE

1. Record the music.

   You must definitely play in time with the click.

2. Play back to check that the music was recorded as intended.

   If not, you might need to re-record or perform some editing.

3. Decide how much permanent alteration to the recording you can accept to make the score look good.

   If the answer is “none”, you should prepare your score from a copy of the track. See the section below.

4. Select all parts (on all tracks) that you want to work on.
5. Open the Score Editor.
6. Activate Page Mode.

Preparing parts for score printout

Below follow a few tips to note when preparing a score for printout:

- If a part is complex, you may have to do some manual editing of notes, like moving them or changing their lengths. This means that the recording does not play back exactly as it originally did. If this is a problem, we suggest you work on a copy of the recording. Use the Duplicate Track function on the Project menu to create a version of the track for scoring. Rename the track and mute the original track while you are preparing the score. You can of course also work on a copy of the entire project file.
- For reasons described in the previous chapter, quantizing the track might be a good idea. This reduces the amount of detailed adjustments needed in the Score Editor.
- If you need to quantize, always play back your tracks afterwards to make sure timing was not disrupted due to inappropriate quantize settings. You might have to quantize some sections with one value and others with another.
- If the project contains many repetitions, it might be quicker to record just one instance of each to start with. If you then finish the score work on each section, you can assemble the entire project by working with parts in the Project window. This might save you some time since the detailed adjustments to each section have to be performed only once.
- A similar approach can also be used when you create sections where several instruments play the same rhythm, a horn section for example. Record the first instrument and make adjustments so that it looks like it should in the Score Editor. Then copy the part to the other tracks, and change the pitches of the notes using MIDI input. Finally, go through the copied parts and make fine adjustments, change display transpose settings, etc. This can be a very fast way to create polyphonic parts with complicated rhythms.
- There also may be situations when the quickest way to record a part for several instruments is simply to record it in one go, by playing the chords on your MIDI instrument. If you later want to split the recording into separate tracks or polyphonic voices, you can use the Explode function.

RELATED LINKS

Entering and editing notes on page 1323
The Explode function on page 1320

Staff settings

The first thing to do after opening the Score Editor is to make initial staff settings. This is done in the Score Settings dialog, on the Staff page.

There are three ways to open the Score Settings dialog:

- Make the staff active, open the Scores menu and select “Settings…”.
- Double-click on the blue rectangle to the left of the staff.

  If this does not work, the “Double-click on staff flips between full score/part” option may be activated in the Preferences dialog (Scores–Editing page).
- Make the staff active and click the “i” button on the extended toolbar.

  For this to work, make sure no notes or symbols are selected – otherwise, clicking the “i” button may open a dialog with settings for the selected object instead.

Click the Staff button to open the Staff page of the Score Settings dialog. The Staff page shows the current settings for the staff on four tabs.

RELATED LINKS

Displaying single voices or the complete score on page 1293
Staff settings on page 1348

Situations which require additional techniques

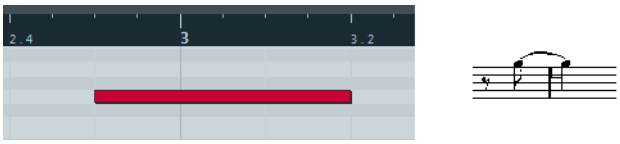
The notes may not always appear in the score as you expect them to, initially. This is because there are a number of situations which require special techniques and settings.

Below you can find a list of some of these and where to find more information about handling them:

- Notes at the same position are considered to be part of a chord. To get independent voicing e.g. notes with different stem directions, such as for vocal material, you need to use the polyphonic voicing feature.

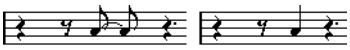
  

  Without and with polyphonic voicing
- If two notes beginning at the same position have different lengths, the longer one is displayed as a number of tied notes. To avoid this, you can either use the No Overlap feature or polyphonic voicing.
- One note is often displayed as two notes with a tie. Please note that this is merely the way the program displays this note; only a single note is “stored”.



This single note in the Key Editor is displayed as two tied notes in the Score Editor.

- Normally the program adds ties where necessary (if a note stretches over a beat), but not always. For a “modern” notation of syncopated notes (less ties) use the Syncopation feature.



The same note, without and with syncopation

- If you find that you want a long note to be displayed as two or more tied notes, you can achieve this with the Cut Notes tool.
- If two notes on the same position are too close to each other or if you want their order in the part reversed, you can do this without affecting playback.
- If a note has the wrong accidental, this can be changed.
- Stem direction and length are automatic, but you can change them manually if you wish.
- If you need a split staff (e.g. when you are scoring for piano), there are special techniques for this.

RELATED LINKS

Polyphonic voicing on page 1517
No Overlap on page 1354
Syncopation on page 1353
The Cut Notes tool on page 1393
Graphic moving of notes on page 1394
Accidentals and enharmonic shift on page 1377
Background: Note stems on page 1373
Split (piano) staves on page 1342

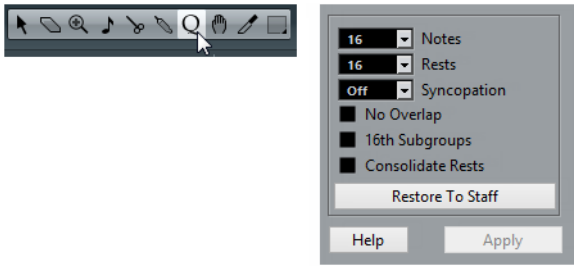
Inserting Display Quantize changes

Some situations may require different staff settings on different sections of the track. The staff settings are valid for the entire track, but you can insert changes wherever you like:

PROCEDURE

1. Select the Display Quantize tool on the toolbar or the context menu.

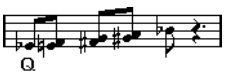
   The Display Quantize dialog opens.



Select the Display Quantize tool to open the Display Quantize dialog.

2. Activate the flags you need and set the quantize values as desired.
3. If you want to restore the settings to the ones used in the Score Settings dialog (Staff page), click the “Restore To Staff” button.
4. Move the mouse over the staff where you want to insert a new Display Quantize value.

   Use the Mouse Time Position display in the status line to find the exact location. The vertical position is of no relevance as long as you click somewhere in the staff.



5. Click the mouse button to insert a Display Quantize event.

RESULT

The new quantize settings are now inserted into the staff at the position where you clicked. The settings are valid until a new change is inserted. Display Quantize events is always inserted for all voices.

If you are using polyphonic voices, you can insert a Display Quantize event for all voices by pressing [Alt]/[Option] and clicking with the tool.

If the “Display Quantize Tool affects all Voices” option is activated in the Score Settings dialog on the Project page (Notation Style subpage, in the Miscellaneous category), Display Quantize events is always inserted for all voices.

RELATED LINKS

Display Quantize and Interpretation Options on page 1351
The status line on page 1299
Polyphonic voicing on page 1517

Viewing and Editing Display Quantize Changes

If you activate the “Quantize” checkbox on the filter bar, a marker is shown under the staff for each Display Quantize setting you have entered with the tool.

This allows you to edit your settings in the following ways:

- To edit a Display Quantize change event, double-click on its marker.

  This opens the Display Quantize dialog again – adjust the settings and click Apply.

- If the Display Quantize dialog is already open, you can select any Display Quantize change event, adjust its settings in the dialog and click Apply.

- To remove a Display Quantize change, either click its marker to select it and press [Backspace] or [Delete], or click on it with the Erase tool.

RELATED LINKS

Showing and hiding elements on page 1300

Adding Display Quantize changes

Very often, the score is fine except for a few bars somewhere. To remedy the problem, insert two Display Quantize changes with the tool (one at the beginning of the section, one after it to restore to the current staff settings).

If you have mixed triplets and straight notes, it can be tempting to insert many Display Quantize changes. Before you do so, try the Auto Quantize options and their additional settings.

RELATED LINKS

If your music contains mixed straight notes and triplets on page 1353

The Explode function

This function allows you to “split” the notes on a staff into separate tracks. It is also possible to use this function to convert a polyphonic staff into polyphonic voices.

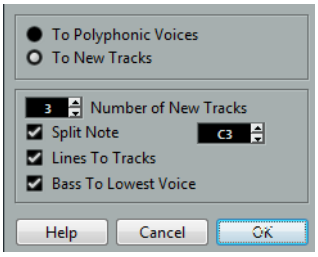
IMPORTANT

Create a copy of the original track first, because it will be changed by the operation.

PROCEDURE

1. Open the Scores menu, open the Functions submenu and select “Explode”.

   The Explode dialog opens.



2. Make sure that “To New tracks” is selected at the top of the dialog.
3. Enter the desired number of new tracks.

   Note that this is the number of new tracks to be created! For example, if you have a three-part polyphonic section and want to split this into three separate tracks, you must specify 2 new tracks, since the original track holds one of the parts.
4. Use the options in the bottom section to set up the criteria for the split.

   Choose from the following options:

Option	Description
Split Note	Use this to move all notes below a certain pitch to another track. When this is selected, it is pointless to specify more than 1 new track.
Lines To tracks	Use this when you want all musical “lines” to be put on one track each. The notes with the highest pitch remains on the original track, the notes with the second highest pitch are put on the first new track, and so on.
Bass To Lowest Voice	When this is activated, the lowest notes always end up on the lowest track.

5. Click OK.

RESULT

A number of new tracks are now added to the score and the Project window.

RELATED LINKS

Automatically – the Explode function on page 1366

Using "Scores Notes To MIDI"

For very complicated scores, there may be situations where you have tweaked the parameters for Display Quantize and Interpretation as best you can, and you still cannot get the score exactly as you want it. Perhaps one setting works fine in one section of the track and another is needed for another section.

In such a case, “Scores Notes To MIDI” helps you out. It changes the lengths and position of some or all the MIDI notes in the edited parts so that they have exactly the values currently shown on screen.

PROCEDURE

1. For safety, go back to the Project window and make a copy of the track.
2. Open the part(s) again in the Score Editor.

   If you only want some sections of your score to be “converted”, make sure to only open those parts.
3. Make sure that the notes you want to affect are not hidden.
4. Select “Scores Notes To MIDI” from the Functions submenu on the Scores menu.

   The notes are now “converted”.
5. Make whatever adjustments are needed to make the score read as intended.

Result

Now that the notes have the exact lengths and positions that were previously only displayed, you can probably deactivate many of the options on the Staff page of the Score Settings dialog and delete Display Quantize settings, etc.

If you find the operation did not give you the result you were after, you can undo your settings or go back to the original track, make a copy of that, and start over.

Related links

Hiding/showing objects on page 1480

Entering and editing notes

About this chapter

In this chapter you will learn:

- How to make various settings for how notes are displayed.
- How to enter notes.
- How to use tools and settings to make the score as legible as possible.
- How to set up a split (piano) staff.
- How to work with multiple staves.

Score settings

Before you start entering notes, you need to make some initial staff settings.

There are three ways to open the Score Settings dialog:

- Make the staff active, open the Scores menu and select “Settings…”.
- Double-click on the blue rectangle to the left of the staff.

  If this does not work, the “Double-click on staff flips between full score/part” option may be activated in the Preferences dialog (Scores–Editing page).
- Make the staff active and click the “i” button on the extended toolbar.

  For this to work, make sure no notes or symbols are selected – otherwise, clicking the “i” button may open a dialog with settings for the selected object instead.

The Score Settings dialog shows the current settings for the active staff.

RELATED LINKS

The basics on page 1292
How the Score Editor works on page 1286
Displaying single voices or the complete score on page 1293
Staff settings on page 1348

Applying settings and selecting other staves

To make settings for another staff, simply make it active in the score (by clicking anywhere in the staff or by using the up/down arrow keys on the computer keyboard).

NOTE

Always click Apply before making another staff active – otherwise your settings are lost!

Staff presets

When you want to reuse settings made for one track in other tracks, you can save some time by creating a staff preset.

NOTE

There are a number of staff presets available, set up to suit various instruments, etc. These are accessed via the Presets pop-up menu on the Staff page of the Score Settings dialog, or from the Staff context menu, opened by right-clicking on the blue rectangle to the left of the staff. Use them as they are, or as starting points for your own settings.

RELATED LINKS

Working with staff presets on page 1349

Suggested initial settings

When you start out entering notes, your staff settings should make your score display the notes as entered. We suggest the following:

Display Quantize: Notes

64

Display Quantize: Rests

64

Auto Quantize

Activated

Syncopation

Off

Consolidate Rests

Off

Clean Lengths

Off

No Overlap

Off

Shuffle

Off

Key

As required

Clef

As required

Auto Clef

Activate this if you want the program to select a treble or bass clef automatically.

Display Transpose value

0

Options tab settings

As is

Polyphonic tab settings

Staff Mode: Single

Tablature tab settings

Tablature Mode deactivated

NOTE

It is very important that you understand how the Display Quantize values for notes and rests interact with the score. If you select too large a notes/rests value, the notes you “click in” may not appear as intended.

RELATED LINKS

Split (piano) staves on page 1342
How the Score Editor works on page 1286
Display Quantize and Interpretation Options on page 1351

Note values and positions

Two of the most important settings for entering notes are the length of the note (the note value) and the minimum spacing between notes (the Quantize value).

Selecting a note value for input

You can choose the length for entering notes as follows:

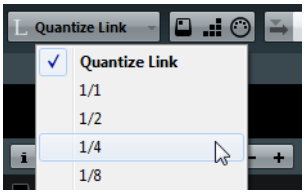
- By clicking the note symbols on the extended toolbar.

  You can select any note value from 1/1 to 1/64 and activate/deactivate the dotted and triplet options by clicking the two buttons to the right.

  The selected note value is displayed in the Length Quantize field on the toolbar and also reflected by the cursor shape of the Insert Note tool.

- By selecting an option from the Length Quantize pop-up menu on the toolbar.

- By assigning key commands to the different length values.

  This is done in the Key Commands dialog (in the category “Set Insert Length”).

About unusual note values

Not all note values can be selected directly, for example double dotted notes. Such notes are created by changing the length of the note after you have entered it, by gluing notes together or by using the Display Length feature.

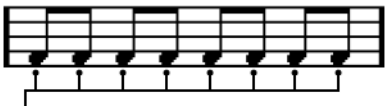
RELATED LINKS

Changing the length of notes on page 1339
Lengthening a note by gluing two notes together on page 1340

Selecting a Quantize value

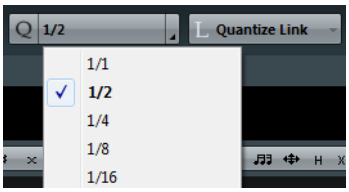
When you move the mouse pointer over the score the Mouse Time Position display in the status line tracks your movement and shows the current position in bars, beats, sixteenth notes, and ticks.

Positioning on screen is controlled by the current Quantize value. If you set this to 1/8, for example, you can only insert and move notes to eighth note positions, at quarter notes, at half bars or at bar positions. It is a good strategy to set the Quantize value to the smallest note value in the project. This does not stop you from inputting notes at “coarser” positions. However, if you set the Quantize value to too small a note value, it is easier to make mistakes.



With the Quantize value set to 1/8, you can only input notes at eighth note positions.

The Quantize value is set on the toolbar on the “Quantize Presets” pop-up menu:



- You can also assign key commands to the different Quantize values.

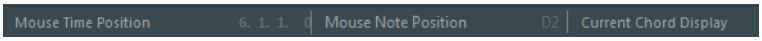
  This is done in the Key Commands dialog (in the category “MIDI Quantize”).

- Just like in the other MIDI editors, you can use the Quantize Panel to create other Quantize values, irregular grids, etc.

  However, this is not often used when inputting score notes.

The mouse position info

While you often use the graphical position in the actual score to determine where the notes go, there are instances when you want to verify the position numerically using the mouse position info displayed in the status line.



The Mouse Note Position display shows the pitch according to the vertical position of the pointer in a staff. The Mouse Time Position display shows the “musical position” in bars, beats, sixteenth notes, and ticks:

- The relation between beats and bars depends on the time signature: In 4/4 there are 4 beats to a bar. In 8/8 there are eight, in 6/8 there are six, etc.

- The third number is the sixteenth note within the beat. Again, the time signature determines the number of sixteenth notes to each beat. In a quarter note based time signature (4/4, 2/4, etc.) there are four sixteenth notes to each beat, in an eighth note based time signature (3/8, 4/8, etc.), there are two sixteenth notes, etc.

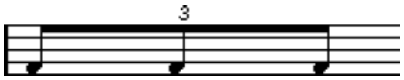
- The last value is in ticks, with 480 ticks per quarter note (and thus 120 ticks per sixteenth note).

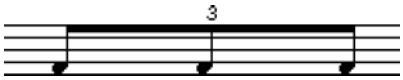
The figures below show some note positions and their corresponding position values:

Eighth note positions

2/2	1.1.1.0	1.1.3.0	1.1.5.0	1.1.7.0	1.2.1.0	1.2.3.0	1.2.5.0	1.2.7.0
4/4	1.1.1.0	1.1.3.0	1.2.1.0	1.2.3.0	1.1.3.0	1.3.3.0	1.4.1.0	1.4.3.0
8/8	1.1.1.0	1.2.1.0	1.3.1.0	1.4.1.0	1.5.1.0	1.6.1.0	1.7.1.0	1.8.1.0

Eighth note triplet positions





2/2	1.1.1.0	1.1.2.40	1.1.3.80	1.1.5.0	1.1.6.40	1.1.7.80
4/4	1.1.1.0	1.1.2.40	1.1.3.80	1.2.1.0	1.2.2.40	1.2.3.80
8/8	1.1.1.0	1.1.2.40	1.2.1.80	1.3.1.0	1.3.2.40	1.4.1.80

Sixteenth note positions

2/2	1.1.1.0	1.1.2.0	1.1.3.0	1.1.4.0	1.1.5.0	1.1.6.0	1.1.7.0	1.1.8.0
4/4	1.1.1.0	1.1.2.0	1.1.3.0	1.1.4.0	1.2.1.0	1.2.2.0	1.2.3.0	1.2.4.0
8/8	1.1.1.0	1.1.2.0	1.2.1.0	1.2.2.0	1.3.1.0	1.3.2.0	1.4.1.0	1.4.2.0

Adding and editing notes

Entering notes using the computer keyboard

A quick and easy way to enter notes, without having to decide on the pitch, position and note value first is using the computer keyboard. To enter a note, proceed as follows:

PROCEDURE

1. On the toolbar, activate the “Computer Keyboard Input” button.

   Now you can enter notes using the computer keyboard.

2. Hold down [Alt]/[Option].

   A note with the note value specified in the extended toolbar appears. By default, the insert position is the first position of the bar and the pitch is C3. You can however change this using the computer keyboard.

   - You can change the pitch of the note by using the up and down arrow keys.

     To transpose the note in octave steps, use the Page Up/Page Down keys.
   - To change the insert position of the note, use the right and left arrow keys.

     Note that for position changes, the Quantize value is taken into account.
   - To change the length of the note, hold down [Shift] and use the right and left arrow keys.

     This changes the note value step by step, passing from one Quantize value to the next.

3. To insert the note, press [Return].

   The note with the specified pitch and note value is inserted at the selected position and the insert position for the next note changes according to the Quantize value. If

you press [Shift]-[Return], the insert position does not change, allowing you to enter chords.

Entering notes with the mouse

To add a note to the score, proceed as follows:

PROCEDURE

1. Make the staff active.

   Notes are always inserted on the active staff.

2. Select the desired note value.

3. If you select the note value by clicking on a symbol on the extended toolbar, the Insert Note tool is automatically selected – otherwise select the Insert Note tool on the toolbar or context menu.

4. Select a Quantize value.

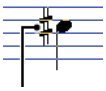
   The Quantize value determines the spacing between notes. If you set Quantize to 1/1 you only can add notes at downbeats. If you set Quantize to 1/8, you can add notes at eighth note positions, etc.

5. Click in the staff and keep the mouse button pressed.

   The Insert Note tool changes into a note symbol (showing the note exactly as it would be inserted in the score).

6. Move the mouse horizontally to find the correct position.

7. Move the mouse vertically to find the correct pitch.

   Accidentals are shown beside the note to indicate the current pitch.

   NOTE

   If the “Show Note Info by the Mouse” option is activated in the Preferences dialog (Scores–Editing page), the position and pitch of the note is also shown in a “tooltip” next to the pointer while you are dragging. If you find that screen redraws are too sluggish, you may want to deactivate this option.

8. Release the mouse button.

   The note appears in the score.

   IMPORTANT

   If you activate the “Animate Note Cursor” option in the Preferences dialog (Scores–Editing page), you do not need to keep the mouse button pressed to see the note as it would be inserted in the score.

RELATED LINKS

The active staff on page 1297
Selecting a note value for input on page 1326

Adding more notes

PROCEDURE

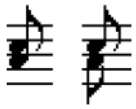
1. If you want the next note to have a different length value, select the corresponding note symbol.
2. If you need finer positioning, or if the current value is too fine, change the Quantize value.
3. Move the mouse to the desired position, and click.

   Notes input at the same position are automatically interpreted as chords, see below.

About the interpretation

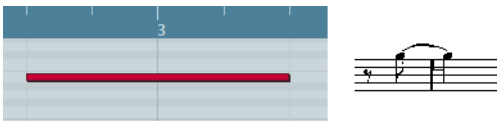
The notes may not always appear in the score as you initially expect them to. This is because there are a number of situations that require special techniques and settings. Below you can find a list of some of these and where to find more information about handling them:

- Notes at the same position are considered parts of a chord. To get independent voicing (for example notes with different stem directions), such as for vocal material, you need to use polyphonic voicing.

  Without and with polyphonic voicing

- If two notes beginning at the same position have different lengths, the longer is displayed as a number of tied notes. To avoid this, you can either use the “No Overlap” feature or polyphonic voicing.
- One note is often displayed as two notes with a tie. This is only how the program displays the note, there is still only a single note “stored”.

  This single note in the Key Editor is displayed as two tied notes in the Score Editor.

- Generally the program adds ties where necessary (if a note stretches over a beat), but not always. For more “modern” notation of syncopated notes (less ties), you need to use the syncopation feature.

  The same note, without and with Syncopation

- If you want a long note to be displayed as two (or more) tied notes, you can use the Cut Notes tool for this.
- If a note has the wrong accidental, this can be changed.

- If two notes on the same position are too close to each other or if you want their “graphical order” in the score reversed, you can do this without affecting playback.
- Stem direction and length is normally automatic, but you can set it yourself.
- If you are scoring for piano and therefore (or for other reasons) need a split staff, there are special techniques for this.

RELATED LINKS

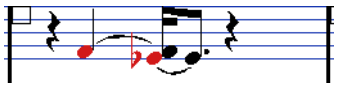
No Overlap on page 1354
Syncopation on page 1353
Accidentals and enharmonic shift on page 1377
Graphic moving of notes on page 1394
Background: Note stems on page 1373
Split (piano) staves on page 1342
Polyphonic voicing on page 1359

Selecting notes

In the operations described in the rest of this chapter, you often work on selected notes. The text below describes how to select notes:

By clicking

To select a note, click on the note head with the Object Selection tool. The note head gets colored to indicate that it is selected.

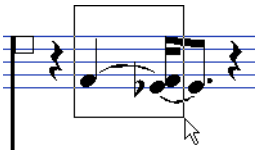


- To select more notes, hold down [Shift] and click on them.
- To deselect notes, hold down [Shift] and click on them again.
- If you hold down [Shift] and double-click on a note, this note and all the following notes in the same staff are selected.

Using a selection rectangle

PROCEDURE

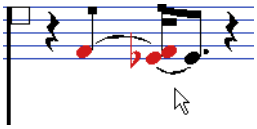
1. Click in an empty area in the score with the Object Selection tool and keep the mouse button pressed.
2. Drag the mouse pointer to create a selection rectangle.



You can drag to select notes on several voices or staves if you wish.

3. Release the mouse button.

   All notes with note heads inside the rectangle are selected.



If you want to deselect one or more of the notes, hold down [Shift] and click on them.

Using the keyboard

By default, you can step through (and select) the notes in the staff using the left and right arrow keys. If you press [Shift], you can select a series of notes as you step through them.

- If you are working with polyphonic voices, you step through the notes on the current track, i.e. in a split system, you step through the staves.
- If you want to use other keys for selecting notes, you can customize the settings in the Key Commands dialog (in the Navigate category).

Selecting tied notes

Longer notes are often displayed in the score as one note with a tie. If you intend to select the entire note (e.g. for deleting), you should select the first note, not the tied note.

IMPORTANT

There is a setting for this in the Preferences dialog (Scores–Editing page): If you activate “Tied Notes selected as Single Units”, the whole note is selected, even if you click on one of the tied notes.

Deselecting everything

To deselect everything, simply click in an empty area of the score with the Object Selection tool.

Moving notes

In the following, you can find descriptions of the various methods to move notes, as well as related features.

Moving by dragging

PROCEDURE

1. Set the Quantize value.

   The Quantize value restricts your movement in time. You cannot place notes on positions smaller than the Quantize value.

2. Select the note(s) you want to move.

   You can select notes across several staves if you wish.

3. Click one of the selected notes and drag it to a new position.

   The horizontal movement of the note is “magnetically attracted” to the current Quantize value. The Mouse Time Position and Mouse Note Position displays in the status line show the new position and pitch for the dragged note.

   NOTE

   If the “Show Note Info by the Mouse” option is activated in the Preferences dialog (Scores–Editing page), the position and pitch of the note is also shown in a “tooltip” next to the pointer while you are dragging. If you find that screen redraws are too sluggish, you may want to deactivate this option.

4. Release the mouse button.

   The notes appear at their new position.

   - If you press [Ctrl]/[Command] and drag, movement is restricted to vertical or horizontal (depending on the direction in which you drag).
   - If you move notes vertically and the “Keep moved Notes within Key” option is activated in the Preferences dialog (Scores–Editing page), the notes are transposed within the current key only.

RELATED LINKS

Selecting a Quantize value on page 1326

Moving by using key commands

Instead of dragging the note with the mouse, you can assign key commands for this:

- The corresponding commands can be found in the Nudge category in the Key Commands dialog.
- When moving notes to the left or right using key commands, the notes are moved in steps according to the Quantize value.

  The keys assigned for up/down nudging transpose notes in semitone steps.

Moving across staves – the Lock button

If you are editing several tracks, you may want to move notes from one staff to another.

PROCEDURE

1. Make the desired Quantize settings and select the notes.

   Make sure to only select notes on the same staff.

2. Make sure that the “L” (Lock) button on the extended toolbar is deactivated.

   When this button is activated, you cannot move notes and other objects from one staff to another, which is handy if you need to transpose a note very high or low, for example.

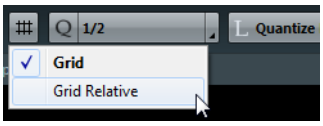
   The “L” Lock button is deactivated.

3. Click on one of the notes and drag them to the new system.

   The active staff rectangle indicates on which staff the dragged note(s) appears.

The Snap mode

The notes you move (or copy) snap to positions defined by the note length and Quantize values. Using the Snap Type pop-up menu on the Score Editor toolbar you can select the Snap mode used when moving or copying notes:



- When using the “Grid” mode, notes you move (or copy) always snap to exact grid positions.
- When using the “Grid Relative” mode, a note with a certain position relative to a grid line always maintains that relative position to the grid when moved (or copied).

Acoustic Feedback

To hear the pitch of the note while moving, activate the speaker icon (Acoustic Feedback) on the toolbar.

About the lock layers

When you are moving and editing notes in the score, you might accidentally move other objects nearby. To avoid this, assign different types of objects to different “lock layers” (up to three) and instruct Nuendo to “lock” one or two of these layers, making them unmovable.

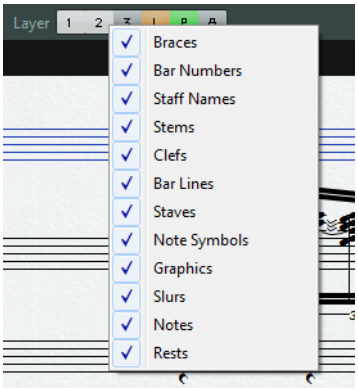
There are two ways to set up which type of object should belong to which lock layer:

- Open the Preferences dialog from the File menu and select the Scores–Note Layer page.

  This page lets you adjust the layer setting for each object type.

- Right-click one of the layer buttons, (1-2-3), on the extended toolbar to bring up a pop-up menu, showing which object types are associated with that layer.

  A checkmark for an object type means it belongs to that layer. If no checkmark is shown, you can select the object type on the menu to move it to that layer.



To lock a layer, click the corresponding layer button, so that it is disabled not highlighted. You can only select or move objects whose Layer button is activated.

NOTE

There are also “L” and “P” layer buttons, for the layout and project layer. Clicking these buttons allows you to lock the layout and project layers.

RELATED LINKS

Using the lock layers on page 1421
Background: The different layers on page 1402

Displaying layers

To see which score objects you assigned to which layer, you can activate and deactivate the Layer buttons on the extended toolbar.

- To display all the score objects that you assigned to the different note layers, activate layers 1, 2, or 3.

- To display all the score objects that are associated with the layout layer, activate the Layout Layer (L) button.
- To display all the score objects that are associated with the project layer, activate the Project Layer (P) button.
- To get an overview of all layers, activate the Colorize Layer (A) button. This deactivates all other layer buttons and displays the score objects in different colors, where each color stands for a specific type of layer.

Duplicating notes

To duplicate notes in the score, proceed as follows:

PROCEDURE

1. Set the Quantize value and select the desired notes.

   You can duplicate any block of notes, even on several systems at the same time. The Snap mode applies.

2. Press [Alt]/[Option] and drag the duplicate notes to their new position.
   - If you want to restrict movements to one direction, press [Ctrl]/[Command].

     This works just as for moving, as described above.
   - If you want to restrict the pitch to inside the current key only, make sure that the “Keep moved Notes within Key” option is activated in the Preferences dialog (Scores–Editing page).

3. Release the mouse button to insert the notes.

   [Alt]/[Option] is the default modifier key for copying/duplicating. If you like, you can change this in the Preferences dialog (Editing–Tool Modifiers page).

   The entry for this is found in the Drag & Drop category (“Copy”).

   NOTE

   You can also move or copy whole bars by dragging the bar handles.

RELATED LINKS

The Snap mode on page 1334
Moving and duplicating with the bar handles on page 1425

Cut, copy, and paste

- To cut notes, select them and choose Cut from the Edit menu (or use a key command, by default [Ctrl]/[Command]-[X]).

  The notes are now removed from the score and put on the clipboard.

- To copy notes, select them and choose Copy from the Edit menu (or use a key command, by default [Ctrl]/[Command]-[C]).

  A copy of the notes is made, and put on the clipboard. The original notes remain where they were.

IMPORTANT

The clipboard can only hold one set of notes. If you cut or copy and then cut or copy again, the notes copied to the clipboard first are lost.

Inserting notes from the clip board to the score

Notes that you have put on the clipboard by cutting or copying can be inserted into the score again as follows:

PROCEDURE

1. Activate the desired staff.
2. Move the project cursor to the position where you want the first note to appear.

   This is done by holding down [Alt]/[Option] and [Shift] and clicking at the desired position in the score.
3. Select Paste from the Edit menu (or use a key command, by default [Ctrl]/[Command]-[V]).

   The notes are pasted in, beginning at the project cursor. If the cut or copied notes come from different staves, they are also inserted on different staves. Otherwise, the notes are inserted on the active staff. They keep the pitch and relative positions they had when you cut or copied them.

Editing pitches of individual notes

By dragging

The simplest way to edit the pitch of a note is to drag it up or down. Remember to hold down [Ctrl]/[Command] to avoid moving the note sideways as well.

- If the “Keep moved Notes within Key” option is activated in the Preferences dialog (Scores–Editing page), notes are transposed within the current key only.
- To avoid accidentally moving the note into another staff, activate the Lock button.
- When you drag the mouse up and down before releasing the button, accidentals are shown beside the note to indicate the current pitch.

  This helps you verify the vertical position for the note.

RELATED LINKS

Moving across staves – the Lock button on page 1334

Using the Transpose Palette

The Transpose Palette on the toolbar contains buttons for transposing the selected notes up or down in steps of one semitone or one octave.

- To show the Transpose Palette, right-click the toolbar and activate “Transpose Palette” on the context menu.

Using key commands

Instead of transposing the note with the mouse, you can assign key commands for this.

- The commands for which you can assign key commands are found in the Nudge category in the Key Commands dialog.

  Transpose commands are, for example, “Up” (transpose one semitone up) and “Down” (transpose one semitone down).

Using the info line

You can use the info line to change the pitches (and other properties) of one or several notes numerically.

- If you have several notes selected and change the pitch on the info line, the changes are relative.

  That is, all selected notes are transposed by an equal amount.

- If you have several notes selected, hold down [Ctrl]/[Command] and change the pitch on the info line, the changes are absolute.

  That is, all selected notes are set to the same pitch.

RELATED LINKS

Info Line on page 47

Via MIDI

PROCEDURE

1. On the toolbar, activate the MIDI Input button and the Record Pitch button to the right.

   If you also want to change the note-on and/or note-off velocity of the notes via MIDI, this can be done by also activating the corresponding velocity buttons.

   To edit notes via MIDI (pitches only), set up the buttons like this.

2. Select the first note that you want to edit.
3. Press a key on your MIDI keyboard.

   The note takes on the pitch of the key you pressed. The program then selects the next note.

4. To change the pitch of the next selected note, simply press the desired key.

   In this manner you can change the pitches of as many notes as you wish, by simply pressing the relevant keys. You can also use key commands (by default the left and right arrow key) to pass from one note to the other. For example, if you make a mistake, you can step back to the previous note by pressing the left arrow key.

RELATED LINKS

MIDI Editors on page 777

Changing the length of notes

When it comes to note lengths, the Score Editor is special in that it does not necessarily display the notes with their actual length. Depending on the situation, you may want to change the “physical length” of the notes or the “display length”.

Changing the “physical” length

This changes the actual length of the notes. The change is audible when you play back the music.

IMPORTANT

Remember that the appearance of notes and rests in the score is determined by the Display Quantize settings on the Staff page of the Score Settings dialog. Depending on the Notes and Rests values, notes may be displayed as if they were longer than they really are.

RELATED LINKS

Display Quantize on page 1288

By using the extended toolbar

Using the extended toolbar is another quick way to set a number of notes to the same length:

PROCEDURE

1. Select the notes that you want to change.
2. Hold down [Ctrl]/[Command] and click on one of the note icons on the extended toolbar.

   All the selected notes now get the note value on which you clicked.

By using the info line

You can also edit length values numerically on the info line. The same rules apply as when changing the pitch of notes.

RELATED LINKS

Using the info line on page 1338

Lengthening a note by gluing two notes together

You can create unusual note length values by gluing notes of the same pitch together.

PROCEDURE

1. Insert the notes that you want to glue together (if they do not already exist).
2. Select the Glue tool on the toolbar or context menu.
3. Click on the first note.

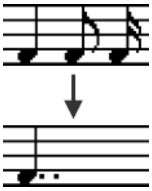
   This note is now tied to the first following note with the same pitch.

   IMPORTANT

   Make sure that you have Display Quantize values for notes and rests that allow you to display notes of the created note value.

4. If you want to glue more notes, click again.

   By gluing together a quarter note, an eighth note and a sixteenth note…

   …you get a double dotted quarter note.

Changing the display length

If you want to change the displayed length of notes without affecting how they play back, the first thing to try is to adjust Display Quantize, either for the whole staff or for a separate section, using the Display Quantize tool.

But you can also make display length adjustments to individual notes in the Set Note Info dialog:

PROCEDURE

1. Double-click on the note.

   The Set Note Info dialog opens.

2. Locate the “Length” setting.

   By default, this is set to “Auto”, which means that the note is displayed according to its actual length (and the Display Quantize settings).

3. Double-click in the value field and enter a new length value (displayed in bars, beats, sixteenth notes, and ticks).

   To set the display length to “Auto” again, scroll the value down to zero.

4. Click Apply and close the dialog.

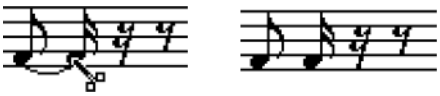
   The note is now displayed according to its display length setting. However, the Display Quantize settings still apply!

RELATED LINKS

Inserting Display Quantize changes on page 1318

Splitting a note in two

If you have two notes strung together by a tie, and click on the “tied” note head with the Split tool, the note is divided into two, with the length of the “main” and the tied note, respectively.



Before and after splitting a tied note

Working with the Display Quantize tool

There are instances when you want different staff settings for different sections of the track. The settings on the Staff page of the Score Settings dialog are valid for the entire track, but by using the Display Quantize tool you are able to insert changes and exceptions wherever you like.

RELATED LINKS

Inserting Display Quantize changes on page 1318

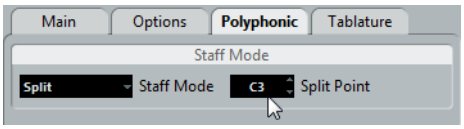
Split (piano) staves

Setting up the split staff

PROCEDURE

1. Make a staff active.
2. Open the Score Settings dialog on the Staff page and select the Polyphonic tab.
3. From the Staff Mode pop-up menu, select Split.
4. Set the Split Point value to a suitable note.

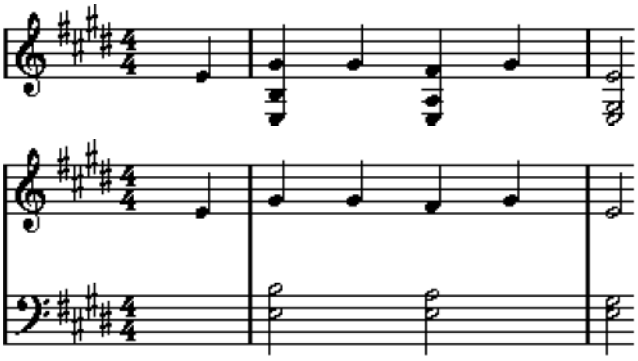
   All notes below this note value are put on the lower clef, all above are put on the upper clef.

   Split mode selected.

   If the default piano clef settings for the upper and lower staff are not what you want, you can adjust these settings now (or you can make key and clef adjustments directly in the score).
5. Make whatever additional staff settings you need.

   These apply to both the upper and lower staves of the split system.
6. Click Apply.

   Before and after setting a split at C3

RELATED LINKS

Setting clef, key, and time signature on page 1303

Changing the split point

PROCEDURE

1. Make sure that the system you are working on is active.
2. Open the Score Settings and select the Staff page.

3. Select the Polyphonic tab.
4. Change the Split Point value.
5. Click Apply.

RESULT

Now, some notes that were previously on the lower staff are on the upper, or vice versa.

Strategies: Multiple staves

As described above, when you have parts on several tracks selected in the Project window, these are put on one staff each, when you open the Score Editor. This allows you to work on several staves in parallel.

Working with several staves is not much different from working with one. Below follow some guidelines that apply specifically to working with multiple staves.

Score settings dialog, Staff page

The settings on the Staff page of the Score Settings dialog are local to each staff. You can have the Score Settings dialog open and select each staff in turn to make settings – just remember to click Apply before selecting another staff, otherwise your changes are lost.

If several staves share settings, you can save some time by using staff presets. Set up the staff settings for the first staff, and save them as a preset. This preset can then be applied to any of the other staves, one at a time.

RELATED LINKS

Working with staff presets on page 1349

Selecting notes

You can select notes from one or several staves at the same time, using any of the selection methods.

RELATED LINKS

Selecting notes on page 1331

Adding notes

This is done just as on a single system. Please note the following:

- When you enter a note, use the Mouse Note Position display (in the status line) to determine the pitch. Whether it ends up on the upper or lower staff has nothing to do with where you aim with the mouse. The Split Point setting always decides if a note goes on the upper or lower staff. If you change the split point, this affects existing notes, see below.
- Sometimes a fixed split point is not good enough. You might want to put two notes with the same pitch on different staves in different parts of the score. To achieve this you need to use polyphonic voicing.
- You can add notes to any staff by clicking on it with the Insert Note tool. The active staff rectangle moves to the staff where you input the note.
- If you need to enter a note with a very high or low pitch, which makes it wind up on the wrong staff when you click, first enter a note with the wrong pitch, and then edit its pitch.

RELATED LINKS

Adding and editing notes on page 1328
Polyphonic voicing on page 1359
Editing pitches of individual notes on page 1337

Inserting and editing clefs, keys, or time signatures

It is possible to insert a change of clef, key, or time signature anywhere in the score.

Inserting a symbol on one staff

PROCEDURE

1. In the Symbols Inspector, open the “Clefs etc.” tab.

   This contains clef, key, and time signature symbols.

2. Select the symbol that you want to insert.

   When you move the mouse over the score display, the pointer takes on the form of a pencil.

3. Move the mouse over the staff where you want to insert a new symbol.

   Use the Mouse Time Position display in the status line to find the exact location. The Mouse Note Position, i.e. the vertical position is of no relevance as long as you click somewhere in the staff. Time signature changes can only be inserted at the beginning of a bar.

4. Click the mouse button to insert the symbol.

IMPORTANT

Inserting a symbol at position 1.1.1.0 is the same as changing the staff settings which are stored in the track. Inserting anywhere else adds the change to the part.

RELATED LINKS

About the Draw tool on page 1409

Inserting a symbol on all staves

If you hold down [Alt]/[Option] when you insert a symbol with the Draw tool, it is inserted at this position on all staves currently being edited in the Score Editor.

- Time signature changes are always inserted on all tracks in the score.

  Or rather, they are inserted on the signature track, which affects all tracks.

- For key changes, Display Transpose is taken into account.

  This allows you to set all staves to a new key and the staves set to Display Transpose still show the correct key after the key change.

NOTE

If some of the staves are bracketed (straight brackets only, as set up in the Score Settings dialog on the Layout page), inserting a symbol for one of these staves inserts it for all other staves within the bracket. Staves outside the bracket are not affected.

RELATED LINKS

Adding brackets and braces on page 1493

Editing clefs, keys, and time signatures

If you double-click on a symbol, a dialog appears allowing you to change the settings for it.

If you hold down [Alt]/[Option] when double-clicking, all symbols at the same position are changed accordingly. With key signatures, the Display Transpose value is taken into account as described above.

- In the Score Settings dialog on the Project page (Notation Style subpage), you can find several options for how clef, key, and time signature changes are displayed.

  You can also adjust the automatic spacing between these symbols in the Spacings subpage. See the dialog help for details.

Moving clefs

Clefs inserted into the score have an effect on how notes are displayed. If you for example insert a bass clef in the middle of a treble staff, the staff switches to show bass pitches. Therefore it is very important where you insert the clef.

If you want to move the clef graphically, without disturbing the relation between the clef and the notes, proceed as follows:

PROCEDURE

1. Select the Layout tool on the toolbar or context menu.

   Note that this tool is available in Page Mode only.

2. Click on the clef and drag it to the desired position.

   Note that this tool is available in Page Mode only.

   NOTE

   When you insert a clef change in the score, you can decide whether this has the same size as the first (default) clef symbol or whether it is displayed with a smaller symbol. Simply right-click the symbol and activate or deactivate “Display Clef Changes as Small Symbols”.

   NOTE

   When “Warnings for new Clefs at Line Breaks” is activated on the Clef context menu and you inserted a clef change at a line break in the score, the Clef change symbol is inserted in the last bar before the staff break. When this is deactivated, the symbol is inserted in the first bar of the next staff line.

Deleting notes

Using the Erase tool

PROCEDURE

1. Select the Erase tool on the toolbar or context menu.
2. One at a time, click on the note(s) you want to erase, or enclose them in a selection rectangle, and click on any of the notes.

Using the Delete menu option or the keyboard

PROCEDURE

1. Select the notes that you want to delete.
2. Select Delete from the Edit menu, or press [Delete] or [Backspace] on the computer keyboard.

Staff settings

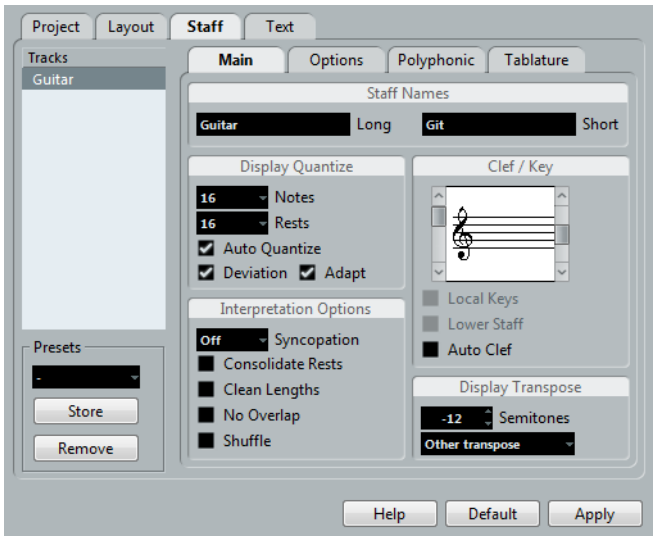
About this chapter

In this chapter you will learn:

- How to make staff settings.
- How to work with staff presets.

Staff settings

Below follows a run-through of all staff settings, more detailed information about the ones already described and references to other places in the manual for some options.



The Staff page has four tabs – here, the Main tab is selected.

Making settings

PROCEDURE

1. Open the Score Settings and select the Staff page.
2. With the dialog open, make the desired staff active.

   Click anywhere in a staff to make it active, or use the up and down arrow keys to step from staff to staff.
3. Select the desired tab and make all necessary settings.

   The settings for regular staves are found on the Main and Options tab, the Polyphonic tab contains settings for split systems and polyphonic voices while the Tablature tab lets you set up tablature scores.
4. When you have made the desired settings, click Apply.

   NOTE

   If the “Apply closes Property Windows” option is activated in the Preferences dialog (Scores–Editing page), clicking Apply also closes the dialog.

   To make settings for another staff, simply make it active in the score (by clicking anywhere in the staff or by using the up/down arrow keys on the computer keyboard).

   However, please note that you need to click Apply before making another staff active – otherwise your settings are lost!

   IMPORTANT

   Staff settings can be saved in the track presets.

RELATED LINKS

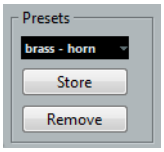
Track Presets on page 167

Working with staff presets

Making staff settings for your scores can be time-consuming. Staff presets allow you to reuse those settings whenever you work with a staff similar to one you have worked on before. A staff preset contains all the settings from the Staff page of the Score Settings dialog, except for the key.

- To save the current settings (including the settings on the Options tab, see below) click the Store button in the Presets section of the Staff page.

  Enter a name for the preset in the name dialog that appears, and click OK. The preset is now available on the Presets pop-up menu (in all projects).



- There are a number of staff presets available, set up to suit various instruments, etc. The presets are accessed from the Presets pop-up menu on the Staff page of the Score Settings dialog or from the staff context menu, opened by right-clicking on the blue rectangle to the left of a staff.

  Use them as they are, or as starting points for your own settings. Note that this loads the settings in the preset into the dialog – to apply these to a staff you must click the Apply button as usual. You can also apply staff presets directly in the score – see below.

- To remove a preset, select it from the pop-up menu and click the Remove button.

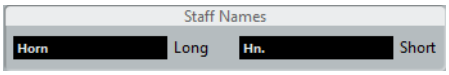
Applying a preset directly in the score

If you right-click on the blue rectangle to the left of a staff, a context menu appears, listing all available presets. Select one to apply it to the staff.

How staff presets are stored

The staff presets are stored as individual files in the Presets–Staff Presets folder within the Nuendo program folder. The presets are available for selection in any project you create or edit.

Staff names



These fields allow you to specify a “long” and a “short” name for the staff. The long name is shown for the very first system for this staff in the score (at the start of the project), while the short name is shown for the remaining systems.

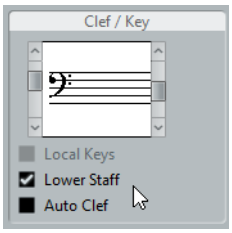
- Whether the names are shown at all is set in the Score Settings dialog on the Layout page.
- If you only want the “long name” to be shown (i.e. if you do not want a name shown for each system in the score), simply delete the short name.
- If the “Show Long Staff Names on new Pages” option is activated in the “Staff Names” section of the Score Settings dialog (Project page), the long name is shown at the beginning of each new page.
- You can also specify two separate subnames by double-clicking the staff name and entering them in the upper and lower text entry fields in the dialog that appears.

Note that this is only displayed correctly, if you are in Page Mode and if “Show Staff Names to Left of Staff” is activated in the Score Settings dialog, on the Project–Notation Style subpage (Staff Names category).

RELATED LINKS

Staff names on page 1462

Key and clef



The basic key and clef settings are described in detail in another section (see below). There is also a Lower Staff checkbox which is only used in conjunction with split (piano) staves and polyphonic voicing.

- If you want to set a different key symbol, e.g. when scoring for French horn, activate the “Local Keys” option.

RELATED LINKS

Setting clef, key, and time signature on page 1303
In a split system on page 1307

Display Quantize and Interpretation Options

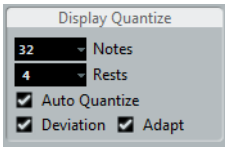
These two sections of the dialog contain a number of settings used to determine how the notes are interpreted. While these settings are more critical to making MIDI recorded music appear as legible as possible it is still important to have them set correctly when entering notes using the mouse. Below you can find descriptions of the settings.

There are “fixed” Display Quantize values plus an “Auto” option which should only be used when your music contains mixed straight notes and triplets.

RELATED LINKS

Adding Display Quantize changes on page 1320
Display Quantize on page 1288

Display Quantize values



Notes and Rests

- Generally, the Notes value should be set to a value equal to, or smaller than, the “smallest note position” that you want to be shown in the score.
- The Rests value should be set to a value equal to, or smaller than, the smallest note value (length) you want to be displayed for a single note, positioned on a beat.
- If the score contains only triplets, or mostly triplets, select one of the Triplet options.

Auto Quantize

- If the project contains no triplets or only triplets, deactivate this option.
- If the project contains mixed triplets and straight notes, activate this option (see below).

Deviation and Adapt

- When Deviation is activated, triplets/straight notes are detected even if they are not exactly “on the beat”. However, if you know your triplets/straight notes are perfectly recorded (quantized or entered by hand), deactivate this option.
- When Adapt is activated, the program “guesses” that when one triplet is found, there are probably more triplets surrounding it. Activate this option if not all of your triplets are detected.

If your music only contains “straight” notes or triplets

PROCEDURE

1. Specify a Notes value.

   For example, if you have notes on odd sixteenth note positions, the Notes value should be set to 16 (sixteenth notes). The “T” values on the pop-up menu are for triplets.
2. Specify a Rests value.

   For example, if you want a single short note on a beat (quarter note position) to be displayed as a quarter note, set the Rests value to 4 (quarter notes).
3. Deactivate the Auto Quantize option.

4. Set all the Interpretation Options.

   These are described in detail below.

5. Examine the score.
6. If necessary, use the Display Quantize tool to insert “exceptions” to the staff settings.

RELATED LINKS

Inserting Display Quantize changes on page 1318

If your music contains mixed straight notes and triplets

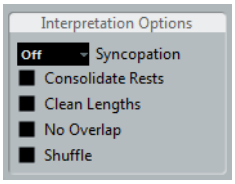
PROCEDURE

1. Examine the score and decide if it mainly contains triplets or mainly “straight” notes.
2. Set the Notes value accordingly.

   If the score is mainly triplets, select the smallest triplet note position used in the score. If it is mainly straight notes, select the smallest “ordinary” note position.

3. Set the Rests value as described above.
4. Activate the Auto Quantize option.
5. Activate the Deviation and Adapt flags if you need them.

Interpretation Options



Syncopation

Activate Syncopation when the program adds more ties to notes crossing beats and bar lines than you prefer. The following options are available:

Relax

When Syncopation is “relaxed”, the program applies syncopation in a number of common cases.

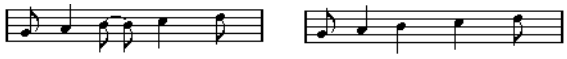
Full

Syncopation is on.

Off

Syncopation is off, with no exceptions.

For a “modern” notation of syncopated notes, activate Syncopation.



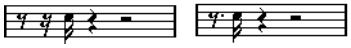
Without and with Syncopation

Again, without and with Syncopation

Note that you can insert “exceptions” to the Syncopation setting in the Score Settings dialog on the Staff page, by using the Display Quantize tool. You can also create tied notes in various combinations by using the Cut Notes tool.

Consolidate Rests

Activate this when you want small consecutive rests joined into one (an eight note rest and a sixteenth note rest joined to a dotted eighth note rest for example).



Consolidate Rests deactivated and activated

Clean Lengths

When this option is activated, the program interprets the length of your notes differently. A note’s length (in the display only) might be extended to the beginning of the next note or to the next Rests “position” for Display Quantize. An example:

- If a note is too short, you may get a rest just after it.
- When Clean Lengths is activated, the rest disappears.

A slightly short eighth note without and with “Clean Lengths”.

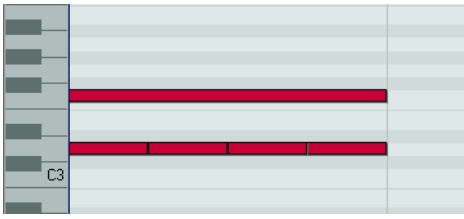
If using Clean Lengths does not help in a particular situation, you can manually resize the offending note(s) or use the Display Quantize tool.

RELATED LINKS

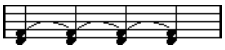
Inserting Display Quantize changes on page 1318

No Overlap

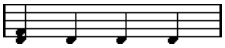
When notes starting at the same position have different lengths, the program tends to add more ties than you may want. This can be avoided by using No Overlap.



This recording in the Key Editor…



…is displayed like this when No Overlap is deactivated…



…and like this when No Overlap is activated.

You can insert “exceptions” to the No Overlap setting on the Staff page of the Score Settings dialog, by using the Display Quantize tool.

IMPORTANT

Please note that there may be situations when neither of these alternatives is ideal. If you run into such a situation, it can probably be resolved by using polyphonic voicing.

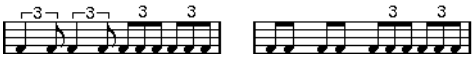
RELATED LINKS

Polyphonic voicing on page 1359

Shuffle

In jazz it is very common to score a shuffled beat as straight notes, simply to make it more legible.

When the Shuffle flag is activated, the program searches for eighth note or sixteenth note pairs where the second note is played late (with a “swing feel” or as the third note in a triplet). Such pairs are displayed as regular eighth or sixteenth notes instead of triplet-based figures.



Without and with Shuffle

Display Transpose

This is used when preparing parts for instruments that are not scored at the actual concert key. For example, if you want the note C3 to be played by an alto sax, you have to score it as an A3 – nine semitones up. Luckily, the Display Transpose setting takes care of this for you:

- Use the pop-up menu to select the instrument for which you are scoring.
- If the pop-up menu does not list your instrument, you can set the desired transposition with the Semitones value field.

NOTE

The Display Transpose setting does not affect playback or the actual pitch of the notes – it only changes how they are displayed and printed.

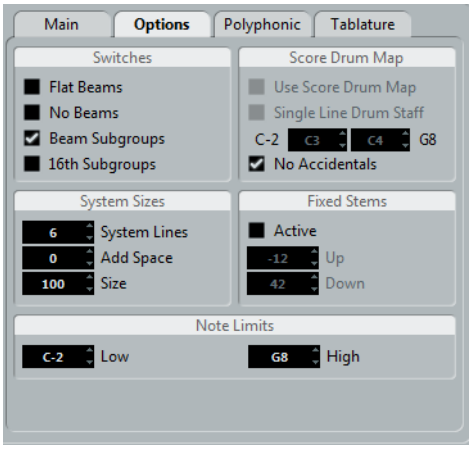
You can also insert Display Transpose changes anywhere in the score, by inserting a key change symbol and using the Transpose setting in the Edit Key dialog.

- In the Score Settings dialog, on the Project page ("Chord Symbols" subpage), deactivate the "Use Display Transpose" option if you do not want the chord symbols to be affected by the Display Transpose setting.
- You can disable Display Transpose by deactivating the "Display Transpose" button on the toolbar of the Score Editor.

RELATED LINKS

Display Transpose in the Edit Key dialog on page 1311
Chord Symbols on page 1446
Transposing instruments on page 1311

The Options tab



Clicking the Options tab in the dialog brings up another page with additional settings. Below follows a brief description of these, with references to more detailed explanations.

Switches

This section allows you to make beam settings.

Flat Beams

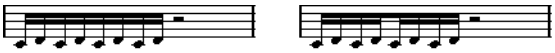
Activate this when you want the beams over notes to be flat (as opposed to slanted).

No Beams

Activate this when you do not want any beaming at all on the staff (for example for vocal scoring).

Beam Subgroups

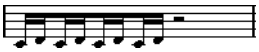
Use this when you want sixteenth notes displayed under a beam to be divided into groups of four notes.



Without and with Beam Subgroups.

16th Subgroups

Use this when you want even smaller subgroups of sixteenth notes. This setting has no effect if Beam Subgroups is deactivated.



As above, but with 16th Subgroups activated.

RELATED LINKS

Beam appearance and slant settings on page 1390
Turning beaming on/off on page 1384
Handling beam groups on page 1389

System Sizes

This section allows you to set the number of system lines and to control spacing between the lines:

System Lines

The number of lines in a system. For regular scoring, this should be set to 5.

Add Space

Allows you to increase or decrease the space between the lines in a system.

Size

Allows you to set a size for the systems, as a percentage (with 100% being the default value). In effect, this setting scales the score vertically.

Score Drum Map

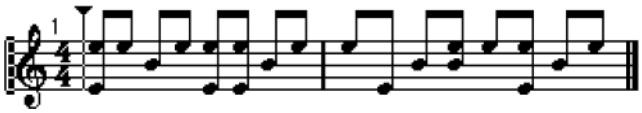
When scoring for drums, you can assign a unique note head to each pitch. There is even the possibility to set up different note heads for different note values!

RELATED LINKS

Scoring for drums on page 1500

Fixed Stems

Activate this if you want all note stems to end at the same vertical position. This feature is perhaps most often used when scoring for drums.



A drum pattern with Fixed Stem length activated

The Up and Down parameters determine which position (relative to the top of the staff) is used for up and down stems, respectively. The graphical display helps you get your settings right.

RELATED LINKS

Setting up a staff for drum scoring on page 1504

Note Limits

Use the Low and High fields to specify a note range. In the active staff, any notes outside this range are displayed in a different color. When writing a score for a specific instrument, this makes it easy to find notes that are outside of this instrument's note range.

NOTE

If the "Hide Notes beyond limits" option is activated in the Preferences dialog (Scores–Editing page), any notes outside the Note Limits range are hidden.

The Polyphonic tab

This is where you activate and set up split (piano) systems or polyphonic voices (several independent score lines in the same staves).

RELATED LINKS

Polyphonic voicing on page 1359

The Tablature tab

This tab contains settings for creating tablature scores.

RELATED LINKS

Creating tablature on page 1506

Polyphonic voicing

About this chapter

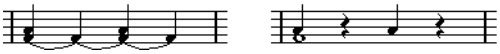
In this chapter you will learn:

- How to decide when to use polyphonic voicing.
- How to set up voices.
- How to automatically convert your score to polyphonic voicing.
- How to enter and move notes into voices.

Background: Polyphonic voicing

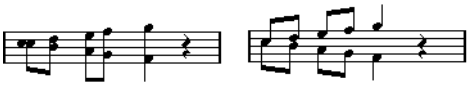
Polyphonic voicing allows you to resolve a number of situations impossible to score properly otherwise:

- Notes starting at the same position, but with different lengths. Without polyphonic voicing you get unnecessary amounts of ties.

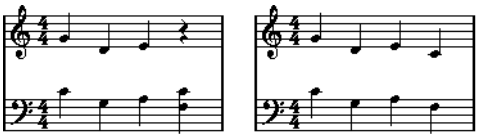
  Without and with polyphonic voicing

- Vocal scoring and similar. Without polyphonic voicing, all notes starting at the same position are considered parts of a chord. With polyphonic voicing you can give each voice a stem direction, you can have individual rest handling for each voice, etc.

  Without and with polyphonic voicing

- Complicated piano systems. Without polyphonic voicing, you have to resort to a fixed split note setting to decide which notes go on which clef. With polyphonic voicing, the split point can be “floating”. The program can even automatically put a bass line on the lower clef for you.



With a split system and with polyphonic voicing

How voices are created

Nuendo allows for up to eight voices. The first thing you do is to set them up. This includes “telling” the program which voices belong to the upper clef and which belong to the lower, how you want rests displayed for each voice, etc.

The second thing you do is to move or enter notes into the voices. If you have a recording done already, the program can do much of this work for you, automatically. You might then want to fine-tune by moving one or more notes into another voice, or you might want to add notes to a certain voice.

IMPORTANT

Each voice is polyphonic. In other words, one voice can contain chords.

RELATED LINKS

Adding and editing notes on page 1328

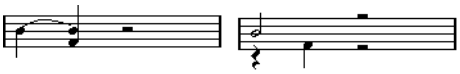
Overlapping notes

Throughout this chapter you encounter the term “overlapping notes”. Two notes are considered overlapping when they are on the same staff and:

- They start at the same position, but have different note values (for example whole note and a quarter note both at the beginning of a bar), or…

Notes starting at the same position, without and with polyphonic voices.

- One note starts before another has ended. For example a half note at the beginning of a bar and an eighth note at the second beat.



A note that starts before another has ended, without and with polyphonic voices.

Voices and MIDI channels

Internally the program organizes the notes into voices by changing their MIDI channel values. Normally you set it up so that notes with MIDI channel 3 belong to voice 3 etc. Most of the time the link between MIDI channels and voices is totally transparent to you as a user. Sometimes you can take advantage of this relationship, as described later in this chapter.

There are also a few important things to note:

NOTE

When you make a note part of a voice, you are in fact changing its MIDI channel value. However, when you change the voice's MIDI channel values in the setup dialog, this does not affect the notes' MIDI channel setting. This can lead to serious confusion, since the relationship between the notes and the voices is affected. It might even make notes disappear (the program warns if this happens). In other words, do not change the MIDI channels on the Polyphonic tab of the Staff page in the Score Settings dialog after you have put your notes into voices, unless you are absolutely sure of what you are doing.

NOTE

When you open a part that contains notes on different MIDI channels, these notes are in fact already assigned to voices (since notes are assigned to voices using their MIDI channel setting). While this fact can be put to good use, it can also create confusion, and even disappearing notes, as described above.

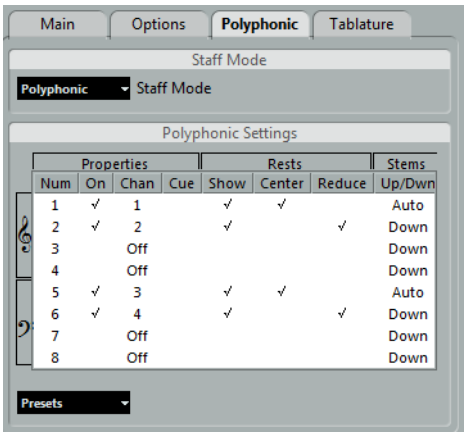
Setting up the voices

To set up your score for polyphonic voicing, proceed as follows:

PROCEDURE

1. Make sure that the desired staff is active.
2. Open the Score Settings dialog and select the Staff page.
3. Select the Polyphonic tab.
4. Open the Staff Mode pop-up menu and select Polyphonic.

   This makes the voice list in the lower part of the dialog available. It consists of eight rows, one for each voice. They are numbered and therefore we refer to them as voices 1 to 8.



IMPORTANT

Do not confuse the voice numbers with the MIDI channel setting for each voice.

5. To activate a voice, click in its “On” column, so that a checkmark appears.

   There are four voices on each staff, for a total of eight. If you activate one “upper” voice and one “lower” voice, you get a split (piano) staff.

6. If you have particular reasons to use specific MIDI channels, change the “Chan” settings for the voices.

   The program automatically sets each voice to a different MIDI channel. If you do not have good reasons to make changes, leave the settings as they are.

   IMPORTANT

   If two voices are set to the same MIDI channel, the lower voice is treated as if it were turned off.

7. Click in the “Rests–Show” column to decide for which voices you want rests displayed.

   A checkmark indicates that rests are shown for a voice. Often you only want rests to be shown for one voice per staff, see below.

8. If you have activated “Rests–Show” for a voice, but do not want rests to be shown in empty bars, click in the “Rests–Reduce” column for that voice.

   This is especially useful for cue voices.

9. Click in the “Rests–Center” column to determine at which vertical positions rests are shown (for voices with “Rests–Show” activated).

   When this option is activated for a voice, the rest is put in the vertical center of the staff, when it is not, the rest gets a vertical position based on the pitch of the notes.

10. Decide on a stem direction for each voice, by selecting from the pop-up menu in the Stems column.

    If you select Auto, the program makes decisions about which stems go in which direction (just as when not using polyphonic voices). You can always force stem direction for individual notes by using the Flip Stem function.

    IMPORTANT

    There is a special stem feature for voice 1: If you set this to Auto, the stem direction depends on the pitch of the note as usual – except if there are voice 2 notes in the bar, because then the voice 1 stems are automatically set to Up!

11. If you want the notes in a voice to be smaller than regular notes, put a checkmark in the Cue column for the voice.

12. Click Apply.

    The staff is changed to polyphonic voicing, and the program distributes the existing notes into voices according to their MIDI channel values.

    At this point you may want to use the Explode function to automatically move notes into the proper voices.

RELATED LINKS

Cue notes on page 1395
Flipping the stem of one or several notes on page 1374
Automatically – the Explode function on page 1366

If the “Some Notes Do Not Belong To Voices…” dialog appears

When you click Apply, a warning may appear saying “Some notes do not belong to any voice and may be hidden. Correct these notes?”.

This warning appears when the staff contains notes with MIDI channel settings which do not match any of the active voices.

If you click the “Correct” button, these notes are moved to active voices. If you click “Ignore”, nothing is changed, and some notes are hidden. However, they are not lost, they appear in all other editors and can be made to appear again in the Score Editor if you change the channel settings for the notes or voices, activate more voices, etc.

About the polyphonic presets

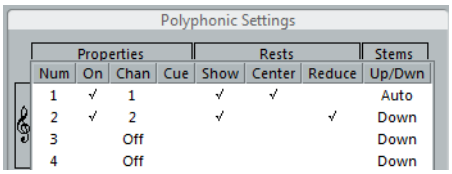
The Presets pop-up menu on the Polyphonic tab (below the list of voices) contains three very useful setups. Instead of making settings by hand, you can select one of the presets, saving some time. The presets are:

Variable Split

This sets up the dialog for two voices, one on each staff, each with auto stem direction. This is a good starting point for a piano staff when the fixed split option does not suffice.

Optimize Two Voices

In this preset, only voices 1 and 2 are activated, and set up like this:



This way the first voice behaves as in single staff mode, but if there are notes in the second voice, the stems of the first one are set to Up.

Optimize Four Voices

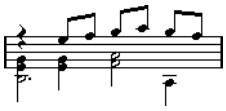
This is like “Optimize Two Voices”, but with two staves. Voices 5 and 6 are activated as well, with the same settings as voices 1 and 2. This is the recommended way to write piano music.

Strategies: How many voices do I need?

Well, it depends

- If you are scoring for vocals, you simply need one voice for each voice, so to speak.
- If you use voices for resolving the problem of overlapping notes, for example when scoring for piano, you need two voices each time two notes overlap. If three notes overlap, you need three voices. In other words you need to check for the “worst case” (largest number of overlapping notes at a certain position) and activate that many. If you do not know how many notes you need when starting out to prepare a score, do not worry, you can add more voices later.
- Voices 1 and 2 on the upper staff and 5 and 6 on the lower are special. These handle “collisions” (notes with small intervals, accidentals that otherwise would come too close, etc.) automatically which the other voices do not. Always use these voices first!

An example: in the situation below, three voices are required. The lowest note overlaps both the “melody” and the chords, so it cannot share a voice with the chords. The chords overlap the melody, so they cannot share a voice either.



RELATED LINKS

Overlapping notes on page 1360

Entering notes into voices

When you add new notes, you need to decide which voice they go into:

PROCEDURE

1. Make sure that the extended toolbar is visible.
2. Select the Object Selection tool.
3. If you have a split system, check the voice Insert buttons.

   These are displayed after the text “Insert” on the left side on the extended toolbar. Only the voices that are activated on the Polyphonic tab are shown. If the upper staff is active, the voice Insert buttons are numbered 1, 2, etc., otherwise they are numbered 5, 6, etc.

4. If you need to switch the voice icons to the right “clef”, click somewhere in the system you want to insert notes in.
5. Select one of the voices by clicking on the corresponding button.

   Any notes you enter from now on are inserted into that voice.

Voice 3 activated for insertion

6. Insert the notes as usual.
7. To switch to another voice, click the corresponding button.
8. To insert notes into a voice on the other clef, click on that clef and then select a voice using the buttons.

RELATED LINKS

Adding and editing notes on page 1328

Symbols and voices

Later in this manual you will learn about symbols that can be added to the score. Many of these symbols must also be put into a particular voice.

RELATED LINKS

Important! – Symbols, staves, and voices on page 1408

Checking which voice a note belongs to

When you select one single note, the corresponding voice button on the extended toolbar is selected. This allows you to quickly find out which voice a certain note is in (after you have used the Move To Voice function, for example).

- When you step through the notes using the arrow keys, you only step through the notes in one voice at a time.

  This can be used as a quick way to check which notes belong to the same voice as some other note.

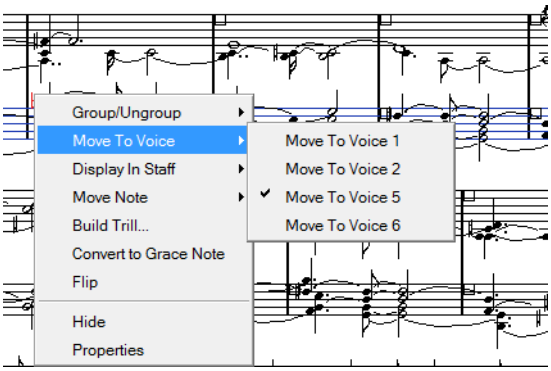
Moving notes between voices

Manually

To manually move notes to another voice, proceed as follows:

PROCEDURE

1. Select the note(s) you want to move to a particular voice.
2. Right-click on one of the notes and select “Move to Voice” from the context menu.



3. On the submenu, select the voice to which you want to move the notes.

   Only the activated voices are available on the menu.

   You can also press [Ctrl]/[Command] and click a voice Insert button on the extended toolbar to move the selected notes to the corresponding voice.

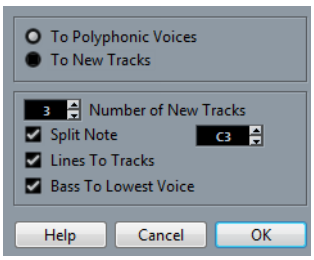
   You can also assign key commands for this in the Score Functions category of the Key Commands dialog on the File menu.

Automatically – the Explode function

The Explode function distributes notes, either onto new tracks or into polyphonic voices:

PROCEDURE

1. Open the Scores menu and select “Explode” from the Functions submenu.



The Explode dialog, set to create polyphonic voices.

2. Make sure that “To Polyphonic Voices” is selected at the top of the dialog.
3. Use the options in the lower half of the dialog to set up the criteria for the split.

   Choose from the following options:

Option	Description
Split Note	Use this to move all notes below a certain pitch to another voice.
Lines To Tracks	Use this when you want all musical “lines” to be put in one voice each. The notes with the highest pitch goes to the first voice, the notes with the second highest pitch goes to the second, and so on.
Bass To Lowest Voice	When this is activated, the lowest notes always ends up in the lowest voice.

4. Click OK.

   The notes are distributed to different voices.

RELATED LINKS

The Explode function on page 1320

Alternative ways of handling voices

Below we suggest further “advanced” ways of putting notes into voices. This is based on the relation between voices and MIDI channels, so please make sure that you understand how this connection works.

- You can use the Logical Editor to put notes into voices, based on other more complex criteria, like for example their pitch and length. This is done by setting up the Logical Editor so that the notes that meet the criteria get their MIDI channel changed to that of their voice.
- When you enter notes using step input you can change the MIDI channel on your input device and directly enter notes into separate voices.
- You can play back each voice on a different MIDI channel, simply by setting the track to Any. This can be used as a convenient way of “proof-hearing” each voice separately.
- You can use the Input Transformer to assign a certain key range to a MIDI channel, and thereby automatically put notes into voices when recording.
- For brass and vocals, you might record each voice on its own track, and use the “Merge All Staves” function to automatically copy each recording to a separate voice on a new track.
- When you have assigned parts to voices, you can use the Extract Voices function to create one track out of each voice.

RELATED LINKS

The Logical Editor, Transformer, and Input Transformer on page 935
Automatic polyphonic voicing – Merge All Staves on page 1371
Converting voices to tracks – Extract Voices on page 1372

Handling rests

With polyphonic voices, you often get more rest symbols than desired.

- If a voice does not need any rests at all, you can deactivate rests separately for this voice on the Polyphonic tab of the Staff page in the Score Settings dialog.
- If you only need rests from one voice on a staff, activate Rests–Center for that voice (this is done in the same dialog). If two or more voices have rests, deactivate Rests–Center. The program then automatically makes sure the rests do not “collide” in the score, by adjusting their vertical position.

- To avoid having several rests displayed in empty bars, you can activate the Rests–Reduce option for all voices (that have rests) except one. This option causes the program to hide rests in empty bars.
- You can use the Hide feature to totally remove individual superfluous rests from the score.
- You can use the Object Selection tool to manually move rests up/down or sideways to adjust the “picture”.
- If needed you can add “rest symbols” (rests that do not affect the playback data in any way) by using the symbols.

RELATED LINKS

Hiding/showing objects on page 1480

Voices and Display Quantize

When you insert Display Quantize changes, you can either apply the settings to all voices (by [Alt]/[Option]-clicking with the tool) or to the current voice only.

IMPORTANT

If “Display Quantize Tool affects all Voices” is activated in the Score Settings dialog on the Project–Notation Style subpage (Miscellaneous category), the Display Quantize settings always affects all voices (even if you do not press [Alt]/[Option] and click).

Making Display Quantize settings for one single voice allows you to do two things:

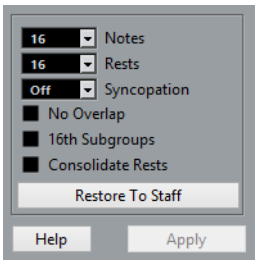
- Make each voice have its own Display Quantize settings by inserting a Display Quantize event for each voice, at the beginning of the staff. This is valid for the entire staff, until another Display Quantize event is inserted.
- Insert Display Quantize “exceptions” anywhere in the score, independently for each voice.

PROCEDURE

1. Make sure that the “Display Quantize Tool affects all Voices” option is deactivated.
2. Select the voice for which you want to insert a Display Quantize event.

   This is done by clicking at the corresponding voice button on the extended toolbar as described above, or by selecting a note that belongs to this voice.
3. Select the Display Quantize tool.
4. Click at the position at which you want to insert the event.

   The Display Quantize dialog appears.



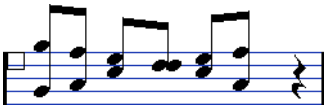
5. Fill out the dialog.
6. Click Apply.

RELATED LINKS

Inserting Display Quantize changes on page 1318
Display Quantize and Interpretation Options on page 1351

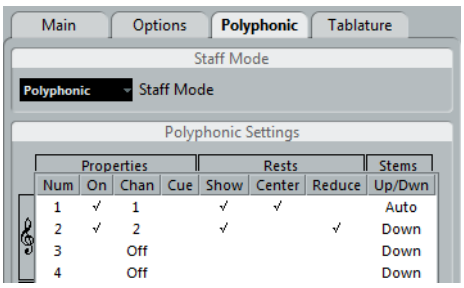
Creating crossed voicings

Often, for example in vocal scoring, you have crossed voicings on one system. You can of course move notes manually into voices to get the stem direction and other note properties right, but there is a quicker way. Let's explain how to do this by example. Without using polyphonic voicing, you have entered this:



PROCEDURE

1. Open the Score Settings dialog on the Staff page and select the Polyphonic tab.
2. From the Staff Mode pop-up menu, select Polyphonic.
3. Activate voice 1 and 2 only, and make settings for them as in the picture below.



4. Click Apply.

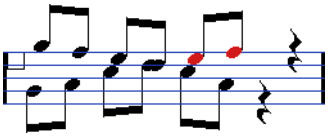
   The staff is in Polyphonic staff mode, but all notes are still in the same voice.
5. Open the Scores menu and select "Explode" from the Functions submenu.
6. In the dialog that appears, select the "To Polyphonic Voices" option and activate "Lines To Tracks".

   Leave the other options off.

7. Click OK.

   The notes have now been split in two “lines”, each in a separate voice. However, from the middle of the bar, notes that are in voice 1 should be in voice 2 and vice versa.

8. Select the two notes that you want to be moved from voice 1 to voice 2.

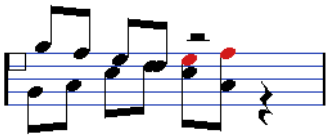
   

   Two notes in voice 1 selected.

9. Move the notes to voice 2.

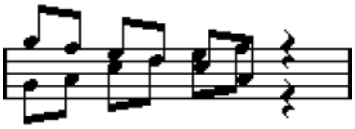
   The quickest way to do this is to press [Ctrl]/[Command] and click the voice Insert [2] button on the extended toolbar.

   Two notes moved to the right voice.

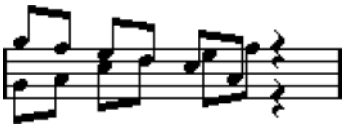
10. Select the two notes that you want to be moved to voice 1 and move them, too.

    All notes in the right voices.

Result

The voicing is now correct, as you can tell from the stem directions. However, there is still some work to do on the notes graphical positions and the display of stems and beams for some of the notes. When you have made those adjustments, the score may look like this:



After making graphical adjustments.

Related links

Graphic moving of notes on page 1394
Manual adjustment of beams on page 1391

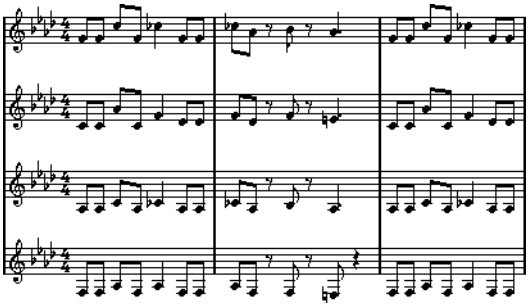
Automatic polyphonic voicing – Merge All Staves

If you have already created some tracks which look and play back as they should, and you want to combine these into one track with polyphonic voices, there is a special function on the Scores menu for this:

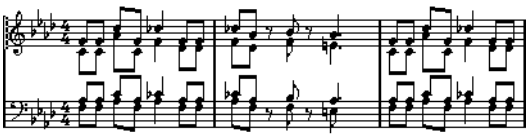
PROCEDURE

1. Open the tracks (up to four) in the Score Editor.
2. Open the Scores menu and select “Merge All Staves” from the Functions submenu.

   Now a new track is created and shown in the score. The track has polyphonic voices activated, and the four original tracks are assigned to one voice each (voices 1, 2, 5 and 6 are used).



Before…



…and after merging the staves

Furthermore, all non-linked symbols that belong to the staff that become the first polyphonic voice in the merged staff are copied. They have the same positions as the original symbols.

IMPORTANT

When you later play back the music, you need to mute the four original tracks, or you get double notes.

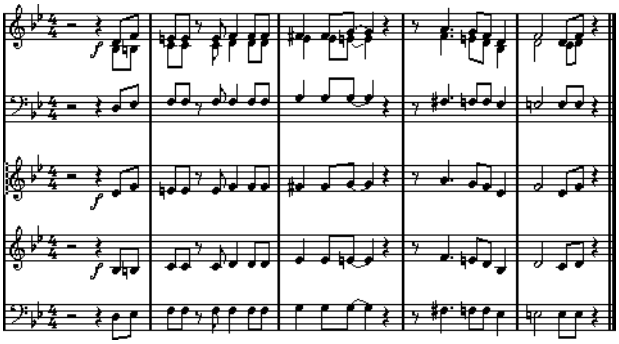
Converting voices to tracks – Extract Voices

This function does the opposite of “Merge All Staves” – it extracts polyphonic voices from an existing track and creates new tracks, one for each voice.

PROCEDURE

1. Open a track containing 2 to 8 polyphonic voices in the Score Editor.
2. Open the Scores menu and select “Extract Voices” from the Functions submenu.

   A number of new tracks is created and added to the display of the Score Editor. Each track contains the music from one polyphonic voice. If there were non-linked symbols in the original track, each new track gets a copy of these symbols.



IMPORTANT

When you later play back the music, you need to mute the original track (the one with polyphonic voices), or you get double notes.

Additional note and rest formatting

About this chapter

In this chapter you will learn:

- How to control stem direction.
- How to control beaming, and create cross-staff beaming.
- How to make detailed adjustments to note appearance.
- How to perform “graphic moving” of notes.
- How to create grace notes.
- How to create tuplets.

Background: Note stems

The direction of stems is governed by five things:

- How notes are grouped under beams.
- Any manual manipulation of beams.
- The Flip Stems function.
- How the note information is set for each note.
- How the Polyphonic tab on the Staff page of the Score Settings dialog is set up (if you use polyphonic voices).

The order of this list corresponds to the priority of the settings, i.e. on conflict, the grouping under beams has the highest priority and the settings made on the Polyphonic tab the lowest.

IMPORTANT

If you have edited the stem length of a note and then flip it, the stem is reset to default length.

IMPORTANT

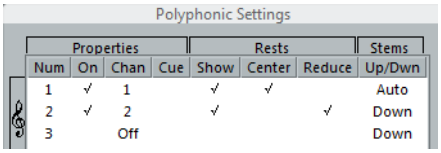
If you have activated the “Fixed Stems” option on the Staff page of the Score Settings dialog (Options tab), a lot of the automatic stem length settings are ignored. However, you can still edit the stem length and direction of individual notes.

RELATED LINKS

Fixed Stems on page 1358

Setting stem direction

In polyphonic voices



In the Score Settings dialog, on the Staff page (Polyphonic tab), the stem direction can be set separately for each voice.

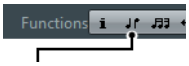
Using Flip Stems

Flipping the stem of one or several notes

PROCEDURE

1. Select the notes.
2. Click the Flip icon on the extended toolbar.

   All the stems in the selection are now flipped. Those that pointed up now point down and vice versa.

   The Flip icon

   You can also assign a key command for this. In the Key Commands dialog on the File menu, the command is called “Flip” and is found in the Score Functions category.

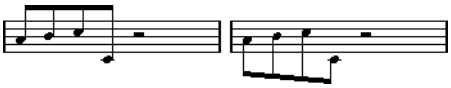
   You can also right-click a note or a selection of notes and select the Flip option from the context menu.

Flipping the stems of notes grouped under a beam

PROCEDURE

1. Select any note in the group.
2. Invoke Flip as described above.

   The entire group is now flipped.



Before and after the flip. No matter which note you select, the entire group is flipped.

IMPORTANT

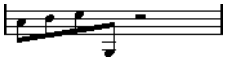
This does not work if you have adjusted the slanting of the beam by dragging. If you have, you must first reset the beam.

RELATED LINKS

Stem length on page 1376

Independent stem direction under a beam

If you need stems attached to the same beam to go in different directions, this is achieved by dragging the beam's start and end points. This feature is available in Page Mode only.



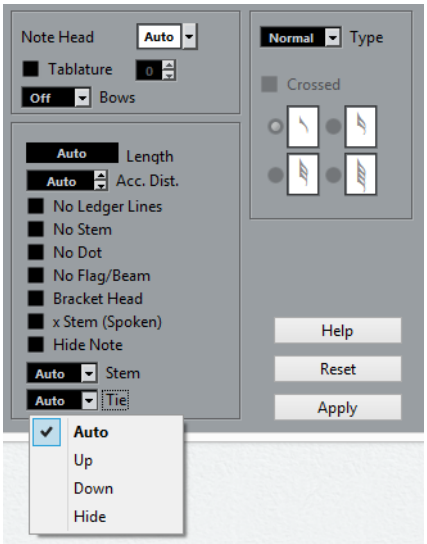
Independent stem direction under a beam

RELATED LINKS

Manual adjustment of beams on page 1391

Stem direction in the Set Note Info dialog

The Set Note Info dialog can be opened by double-clicking on a note head. In its lower left corner you can find a pop-up menu for setting stem direction.



- Setting this pop-up menu to Up or Down is the same as using Flip Stems.
- Setting this pop-up menu to Auto makes the program set the stem direction automatically.

RELATED LINKS

Using Flip Stems on page 1374

Stem length

Adjusting stem length (Page Mode)

PROCEDURE

1. Click on the end of the stem so that a handle appears.

2. If you want to change the lengths of several stems at the same time, hold down [Shift] and select these stems as well.
3. Drag the stem handle (on one of the selected stems) up or down.

   All selected stems are lengthened or shortened by the same amount.

Resetting stem length and beam slants

PROCEDURE

1. Make sure that the filter bar is visible.

   If the filter bar is not visible, click the “Set up Window Layout” button on the toolbar and select the Filters option.

2. Make sure that the “Stems/Beams” checkbox is activated on the filter bar.

   Now, below the notes where stems have been changed or beam slant adjusted manually, the word “Stem” appears.

3. Click on the “Stem” text to select it.

4. Press [Backspace] or [Delete] to remove it.

Before and after deleting the “Stem” item.

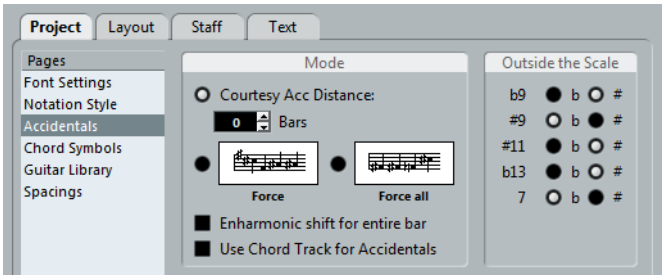
Accidentals and enharmonic shift

Making global settings

In the Score Settings dialog, on the Project page (Accidentals subpage), you can find a number of options for how accidentals are displayed in the score. Once set, these are valid for all tracks in the project. Proceed as follows:

PROCEDURE

1. Open the Score Settings dialog on the Project page and select the Accidentals subpage from the Pages list.



You have the following options:

- Activate the “Courtesy Acc Distance” option and enter a value in the Bars field.

  This determines after how many measures courtesy accidentals are shown. If you set this to “0”, notes outside the scale get accidentals and no courtesy accidentals are shown.

- Activate one of the following options:

Option	Description
Force	Notes outside the scale get accidentals, and accidentals are repeated even within the same bar.
Force all	Every single note in the score gets an accidental.

2. In the “Outside the Scale” area, you can decide how five of the most common intervals outside the scale are displayed, as sharps or as flats.

IMPORTANT

If you activate the “Accidentals for Each Note” option in the Score Settings dialog, on the Project–Notation Style subpage (in the “H.W. Henze Style” category), all notes are displayed with accidentals (even tied notes).

IMPORTANT

If you activate “Use Chord Track for Accidentals”, the chord track is used to determine the accidentals.

RELATED LINKS

Chord Functions (NEK only) on page 890

Enharmonic Shift

If one or several notes are not displayed with the accidentals that you want, you can perform an Enharmonic Shift operation on them.

PROCEDURE

1. Select the notes to be shifted.
2. Click the desired option on the extended toolbar.
3. If you want the enharmonic shift to be repeated in the whole bar, activate the “Enharmonic shift for entire bar” option in the Score Settings dialog (Project–Accidentals subpage).

Extended Toolbar

Use these buttons when you want regular Enharmonic Shifting (select one option).

Use this button when you want to deactivate Enharmonic Shifting for the notes.

Use this button when you want to hide the accidental completely.

Use this button when you want to create a “help accidental” for the selected notes only.

Use this button when you want to enclose the accidental in parentheses. To remove these, select “off”.

Changing the note head shape

PROCEDURE

1. Select the notes for which you want to change the note head shape.

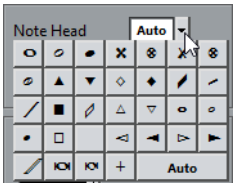
   Make sure not to select the stems, only the note heads.

2. Open the Set Note Info dialog.

   To do so, double-click one of the notes, click the “i” button on the extended toolbar, or right-click on a note head and select “Properties” from the context menu.

3. Open the “Note Head” pop-up menu in the top left corner of the dialog.

   The pop-up menu contains all the available head shapes and an “Auto” option, which selects the normal default shape for the note.



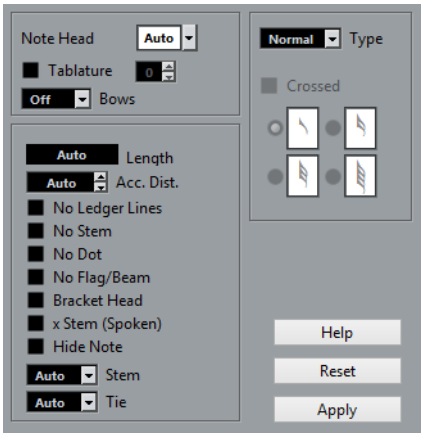
4. Select one of the note heads.
5. Click Apply.

   The settings are applied to the selected notes.

6. If you like, select other notes and make settings for them.
7. When you are done, close the dialog.

Other note details

Each note has a number of settings in the Set Note Info dialog.



The Set Note Info dialog contains the following settings:

Note Head

Used for selecting custom note head shapes.

Tablature on/off and number

Used for creating or editing tablature. This feature can be used for individual notes or together with the automatic tablature function.

Bows

Used for adding bow up/bow down articulation. When selecting “Off”, bow symbols are not displayed for the selected notes.


Bow up and down

Length

This allows you to change the displayed length of notes, without affecting playback. Note that the display quantize settings still apply. To reset this value to “Auto” (so that notes are displayed according to their actual length), scroll the value down to zero.

Accidental Distance

Use this to specify how far from the note, horizontally, you want the accidental. The higher the number the greater the distance.

No Ledger Lines

Turns off ledger lines for notes with high or low pitches.


With and without ledger lines

No Stem

Hides the note stem completely.

No Dot

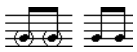
Hides the dot from a dotted note.

No Flag/Beam

Activate this to hide the flags or beams of the selected notes.

Bracket Head

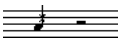
When this is activated, notes are displayed with brackets:



Bracket Head on and off

X Stem (Spoken)

When this option is activated for a note, it is displayed with an x across its stem. This is normally used to indicate spoken words.



Hide Note

Activating this checkbox hides the selected notes.

Stem

Determines the stem direction.

Tie

Determines the direction of ties. When this is set to “Auto”, the program chooses a tie direction depending on the stem direction of the tied notes.

Type

Determines the note type. There are four options:

- Normal. This is how notes usually are displayed.
- Grace. When this is selected, notes are displayed as grace notes.
- Cue. When this is selected, notes are displayed as cue notes (smaller notes, often used as “guide notes” or optional lines).
- Graphic. These are special notes, useful for example for guitar notation (pull-offs) and trills (as “help notes”, indicating which notes to trill between). In both these cases the “No Stems” option could be useful.

  Graphic notes are not included in the “automated cutting”. They are positioned after the notes they “belong to” (as opposed to grace notes).

Crossed

Activate this option, when you want the stem to be crossed by a slanted line (to indicate that the note is a grace note).

Grace note options

These options are available when Grace is selected on the Type pop-up menu.

RELATED LINKS

Changing the note head shape on page 1379
Creating tablature on page 1506
Display Quantize values on page 1352
Using Flip Stems on page 1374
Grace notes on page 1396
Cue notes on page 1395
The Cut Notes tool on page 1393

Coloring notes

You can assign colors to notes using the Event Colors pop-up menu on the toolbar.

PROCEDURE

1. Simply select the notes for which you want to use colors, open the Event Colors pop-up menu on the toolbar and pick a color.

   Only the note heads are colored. Note that the color is only visible once the notes have been deselected.

2. On the far right in the Score Editor toolbar you can find the Hide Colors button.

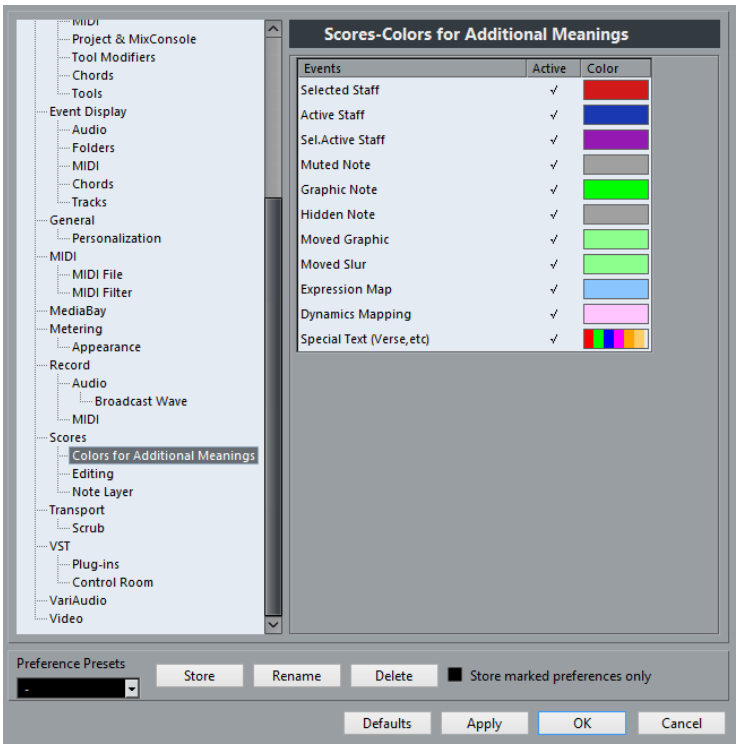
   If you assigned colors to some or all of the notes in your score, this button allows you to switch between display of colored or uncolored notes. This may help you to find selected notes among other colored notes.

Scores Colors for Additional Meanings

If the Preferences dialog (Scores–Colors for Additional Meanings page) you can specify different colors for elements in the score in order to indicate that they are “special” in any way. You can for example choose a color for a “Moved Graphic” or a “Moved Slur”. These objects are colored accordingly when they are moved from their default positions.

PROCEDURE

1. Open the Preferences dialog (Scores–Colors for Additional Meanings).



2. Click in the Active column to activate this function for the corresponding element.

3. Click in the Color field to the right to select a color.

   When color-printing a score, you get the colors you selected for the notes. When you are using a black-and-white printer, the notes appear in black (notes that have not been assigned a color) and different shades of gray (depending on how bright/dark a color was used for the note).

RELATED LINKS

Moving note symbols on page 1427

Copying settings between notes

If you have made various settings in the Set Note Info dialog for a note, and want to use these settings for other notes as well, there is an easy way to do this:

PROCEDURE

1. Set up the first note as desired.

   This includes the settings in the Set Note Info dialog, but also any note-related symbols such as accents, staccato, articulation, etc.
2. In the score, select the note and select “Copy” from the Edit menu.
3. Select the notes to which you want to copy the attributes.
4. Right-click the notes to which you want to copy the attributes, and select “Paste Attributes” from the context menu.

   The selected notes now get the attributes of the first, copied note, but their pitches and note values remain unchanged.

RELATED LINKS

Adding note symbols on page 1409

Handling beaming

Turning beaming on/off

Beaming is enabled/disabled independently for each staff.

PROCEDURE

1. On the Staff page in the Score Settings dialog, click the Options tab.
2. To turn off beaming, activate No Beams and click Apply.

   Even if beaming is deactivated for the staff, you can put some notes under beams, as described below.

Grouping

When beaming is on, the program automatically groups notes under beams. However, there are a number of ways to determine how notes are grouped.

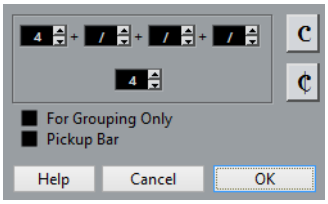
Using the Edit Time Signature dialog

The time signature for the score naturally affects grouping. But you can control this yourself by creating a composite time signature used only for grouping:

PROCEDURE

1. Open the Edit Time Signature dialog by double-clicking the time signature symbol for the staff.
2. Set up the numerator with the grouping you desire.

   If you for example want eighth notes in two groups of three and one group of two, enter 3+3+2.
3. Set the denominator, if necessary.
4. Activate “For Grouping Only”.



5. Click OK.

   IMPORTANT

   Note that the “For Grouping Only” setting only affects the way the numerator is divided. Any changes you make to the “sum” of the numerator number or the denominator result in a change of actual time signature in the project. If you need a grouping which cannot be entered in the current time signature, you have to group notes manually, see below.

Regular grouping of a number of eighth notes or smaller (“Beam”)

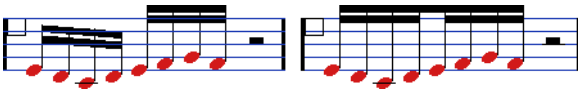
If the grouping the program assigns is not the one you want, you can put any selection of eighth notes or smaller under a beam:

PROCEDURE

1. Select at least two notes, where you want the beam to begin and end.

   All notes between these two notes are grouped under a beam.
2. Click the Group Notes icon on the extended toolbar or right-click on one of the notes to be grouped and select “Beam” from the “Group/Ungroup” submenu of the context menu.

   
   The Group Notes icon



Before and after grouping

Double-clicking on the “Grouping” text opens the Grouping dialog, allowing you to adjust the “note value” for the symbols.

Grouping quarter notes or larger under a beam (“Brillenbass”)

It is also possible to use the grouping feature for notes that are not displayed with beams (quarter notes, half notes, etc.). The result are so called “Brillenbass” symbols, commonly used for indicating repeated accompaniment patterns, etc.

- Double-clicking on the “Grouping” text opens the Grouping dialog, allowing you to adjust the “note value” for the symbols.

Grouping notes using Repeats

To show Repeats for the grouped notes, proceed as follows:

PROCEDURE

1. Make sure that the filter bar is visible in the Score Editor.

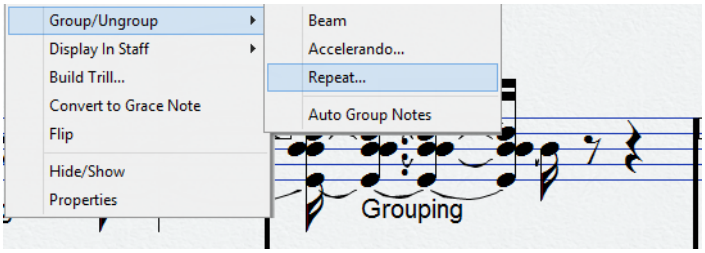
   If the filter bar is not visible, click the “Set up Window Layouts” button on the toolbar and select the Filters option.

2. Activate the “Grouping” checkbox in the filter bar.

   Now, you see the text “Grouping” below all groups you have created.

3. Select the desired notes.

4. Right-click on one of the notes and from the Group/Ungroup submenu, select “Repeat...”



5. In the dialog that appears, use the radio buttons to select the desired note value for the repeats.

In this example, the “Repeat” feature is used to display two pairs of sixteenth notes as two eighth notes with “repeat bars”. Note that the second and fourth sixteenth note have only been hidden – playback is not affected!

6. Click OK to close the dialog.

   Double-clicking on the “Grouping” text opens the Grouping dialog, allowing you to adjust the “note value” for the symbols.

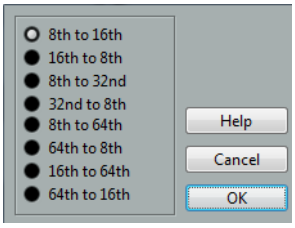
Creating an accelerando/ritardando

To create an accelerando/ritardando, proceed as follows:

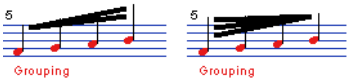
PROCEDURE

1. Select the notes as described above and select “Accelerando” from the Group/Ungroup submenu.

   A dialog appears.



2. Use the radio buttons to select the desired combination (i.e. define whether you want an accelerando or a ritardando and specify the desired note values) and click OK to close the dialog.



   Example for accelerando (left) and ritardando (right)

   Double-clicking on the “Grouping” text opens the Grouping dialog, allowing you to select another combination.

The Grouping dialog

As described above, the Grouping dialog can also be opened by double-clicking an existing grouping text in the score.

- Which Grouping dialog appears depends on the grouping option you used for the notes (Beam, Repeats or Accelerando, see above).

Removing groups

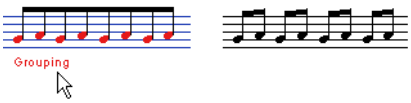
If you have created a group as described above and want to remove it, proceed as follows:

PROCEDURE

1. Make sure that the “Grouping” checkbox is activated in the display filter bar.
2. Select a group by clicking on its “Grouping” text.

3. Press [Backspace] or [Delete].

   The grouping is removed.



   If you need to remove all groups from the score, hold down [Shift] and double-click on the first “Grouping” text.

   This selects all “Grouping” symbols, so you can delete them all at once by pressing [Backspace] or [Delete].

Removing a note from a group

There is no dedicated “ungroup” command, simply because it is not needed. A group can consist of one note if you wish. In other words...

- To remove one note at the end of a group, select it and proceed with grouping as above.
- If you select notes in the middle of a beam and then group, three groups are created.

Before and after grouping

Automatic grouping

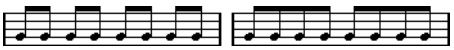
The program can also go through the selected notes and automatically create grouping for you, where it is deemed suitable.

PROCEDURE

1. Select the notes that you want checked for auto-grouping.

   Typically, you would select all notes on the track by using the Select All command on the Edit menu.

2. Right-click on one of the notes and select “Auto Group Notes” from the context menu.



   Before and after using auto grouping in 4/4

   In 4/4 you get for example two groups of eighth notes per bar, in 3/4 you get one group per bar, etc.

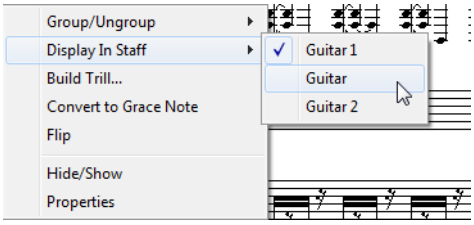
Cross-staff beaming

To create a beam that extends from one staff to another, proceed as follows:

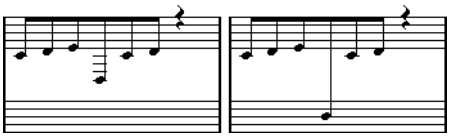
PROCEDURE

1. Set up a split or polyphonic voicing system or open the Score Editor with more than one track.
2. Set up a beam of notes (using the group command) and adjust their pitches so that they are correct even though some of the notes are on the wrong staff.

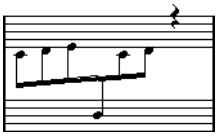
   Use the info line to edit the pitches if they are very low or high.
3. Select the notes that should appear on the other staff.
4. Select "Display in Staff" from the context menu for a selected note and select a staff from the submenu.



   The notes are "graphically" moved to the selected system, but keep their actual pitch.



   Before and after moving a note to the lower staff
5. If needed, adjust the beam appearance.



   Cross-staff beaming with the beam in the middle

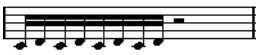
   This does not move the affected notes to another track, but merely displays them as if they belonged to the other staff.

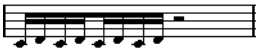
RELATED LINKS

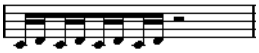
Manual adjustment of beams on page 1391

Handling beam groups

There are two settings for groups under a beam, Beam Subgroups and 16th Subgroups, both found on the Options tab on the Staff page of the Score Settings dialog. If "Beam Subgroups" is activated, the program displays subgroups after four sixteenth notes under a beam. If you also activate "16th Subgroups", subgroups appear after only two sixteenths.

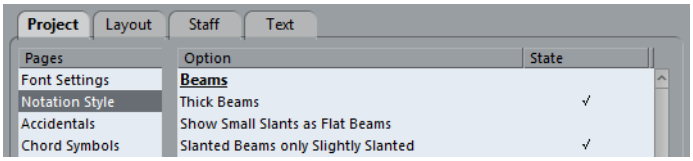

Beam Subgroups off


Beam Subgroups on


On with 16th Subgroups activated

Beam appearance and slant settings

Global settings



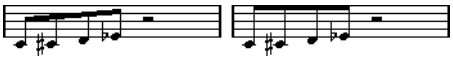
In the Score Settings dialog, on the Project page (Notation Style subpage), you can find the following three options for beam appearance in the Beams category:

- Thick Beams.

  Activate this if you want beams to be displayed as thick lines.

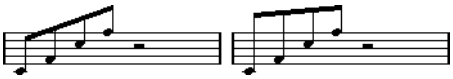
- Show Small Slants as Flat Beams.

  When this is activated, beams that would be only slightly slanted are displayed flat.

  
  Without and with “Show Small Slants as Flat Beams”

- Slanted Beams only Slightly Slanted.

  Activate this if you only want a slightly slanted beam even though there might be a significant pitch difference between the notes under the beam.

  
  Without and with “Slanted Beams only Slightly Slanted”

IMPORTANT

These settings are global for all staves.

Staff settings

In the Score Settings dialog, on the Options tab of the Staff page, you can find a couple of settings for beams as well:

Flat Beams

Activate this when you do not want any slant at all, no matter the pitch difference of the notes under the beams.

No Beams

Activate this when you do not want any beams at all.

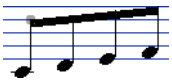
Manual adjustment of beams

For very detailed control you can manually adjust the beam slant:

PROCEDURE

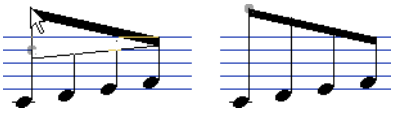
1. Group and flip notes and adjust the settings described above until the beams are as close as possible to how you want them.
2. Click on the corner made up by the beam and the stem.

   A handle appears on the corner of beam and stem.

   A beam handle
3. Drag the handle up or down.

   The slant of the beam changes.

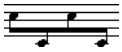
   Dragging a handle and the effect it has.

   NOTE

   You can adjust the distance between notes and their beam without changing the beam slant. Select both handles of a beam (by pressing the [Shift] key while selecting the second handle) and drag one of the handles up or down.

Mixed stem direction

By dragging the beam handles you can put the beam between the note heads:



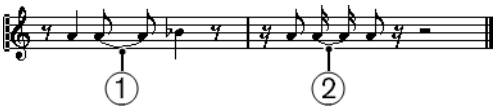
Putting the beam between the notes

About tied notes

Sometimes, notes are displayed as two or more notes tied together. Generally, there are three different occasions when this happens:

- When a note is of an “uneven” length that cannot be displayed without tying together two or more notes of different note values.
- When a note crosses a bar line.
- When a note crosses a “group line” within a bar.

The last case requires some explanation: Nuendo uses a “cutting mechanism” that automatically creates tied notes depending on the length and position of the notes. For example, a quarter note is cut in two and tied if it crosses a half note beat, and an eighth note is cut in two and tied if it crosses a quarter note beat:



1) This quarter note is cut.
2) This eighth note is cut.

However, this is not always what you want. There are three ways to affect the cutting mechanism:

Syncopation

When the Syncopation option is activated on the Main tab of the Staff page in the Score Settings dialog, Nuendo is less prone to cut and tie notes. For example, the second quarter note in the figure above would not have been cut if syncopation had been activated.

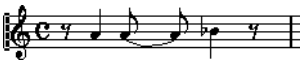
The Syncopation setting affects the whole track, but you can also make syncopation settings for separate sections in the score, by inserting display quantize events.

RELATED LINKS

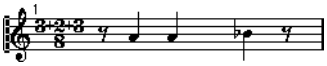
Inserting Display Quantize changes on page 1318

Time signature changes

By inserting time signature changes, you can change the way notes are cut. This is done in the same way as when you specify how beamed notes are grouped.



With a regular 4/4 time signature



With a composite time signature (3+2+3 eighth notes)

RELATED LINKS

Grouping on page 1400

The Cut Notes tool

By using the Cut Notes tool, you can disable the automatic cutting mechanism in a bar, and insert manual cuts at any given position in the score.

PROCEDURE

1. Select the Cut Notes tool.

2. Select a suitable quantize value from the “Quantize Presets” pop-up menu.

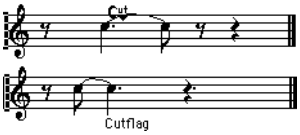
   As usual, this determines where you can click.

3. When you are using polyphonic voices, select the voice you want to make settings for.

4. Click in the bar containing the notes that you want to cut manually, at the position you want them cut.

   This inserts a cutflag event in the bar at the position you clicked. If you hold down [Alt]/[Option], a cutflag event is inserted for all voices in a polyphonic staff.

   A half note, placed at 2.1.3. This is by default cut at 2.3.1 (the middle of the bar). When you click at the position 2.2.1, a cutflag event is inserted.



   As a result, the regular cutting mechanism is disabled and the note is cut at the position you clicked instead.

   The following rules apply to cutflag events:

   - If a bar contains a cutflag event, the automatic cutting mechanism is disabled within that bar.
   - All notes or rests that start before and end after a cutflag event are cut at the position of the event.
   - To display cutflag events, make sure that “Cutflag” is activated on the filter bar.
   - To remove a cutflag event, either click again with the Cut Notes tool at the same position, or select it and press [Backspace] or [Delete].

Other options for tied notes

Tie direction

You can set the direction of the tie manually in the Set Note Info dialog.

RELATED LINKS

Other note details on page 1380

Flat ties

If you prefer ties to be displayed as flat lines, rather than regular “curved” ties, activate the “Flat Ties” option in the Score Settings dialog, on the Project–Notation Style subpage (H.W. Henze Style category).

Graphic moving of notes

There might be instances where the “graphical” order of the notes is not the one you want. In this case, you can move notes without affecting the score or playback in any way. This can be done with the Layout tool or using your computer keyboard.

By using the Layout tool

PROCEDURE

1. Select the Layout tool in the Score Editor toolbar.
2. Click again on the tool button to open the Mode pop-up menu and select the desired option.
3. Click on the note and drag it to the desired position.

   Note that movement is restricted to horizontally only.

   NOTE

   You can also automatically select all notes making up a chord, by holding down [Alt]/[Option] and clicking on one of the notes with the Layout tool.

Modes for the Layout tool

The following modes are available:

Move Single Object

In this mode, only the object you move with the Layout tool is affected (moved). Use this if you want to “correct” the position of one single note in the score, for example.

Move Notes and Context

In this mode, other score objects are moved accordingly when you move a note with the Layout tool. Use this mode if you want to correct the display of all score objects within a bar rather than modifying single note positions.

By using the computer keyboard

You can assign key commands for moving objects graphically. In the Key Commands dialog on the File menu, the commands are found under the Nudge category and called Graphical Left, Graphical Right, Graphical Bottom, and Graphical Top (only the Graphical Left and Graphical Right commands apply to notes).

After assigning key commands, you select the notes that you want to move and press the assigned keys to adjust their graphical position.

Cue notes

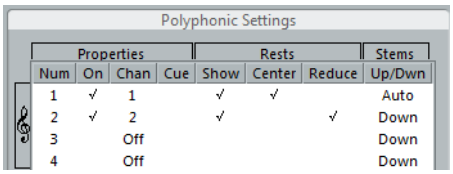
You can create cue notes by using voices or by converting individual notes into cue notes.

Setting a voice to display cue notes

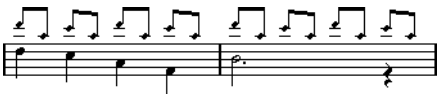
PROCEDURE

1. Open the Score Settings dialog on the Staff page and select the Polyphonic tab.
2. Click in the “Cue” column for the voice, so that a checkmark appears.
3. Decide how to handle rests for the voice.

   You might for example leave “Rests–Show” activated and activate “Reduce”. If you do, you get rests in this voice, but not as many as otherwise. Empty bars, for example, do not have any rests at all.

   “Cue” activated for voice 3
4. Close the dialog.
5. Move the notes into the cue voice.

   An example of a cue note voice

RELATED LINKS

Setting up the voices on page 1361
Polyphonic voicing on page 1359

A quick example

Let's say you have a flute part and want some cue notes for it:

PROCEDURE

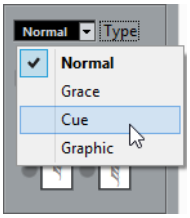
1. Switch on polyphonic voices and activate voice 1 and voice 2.
2. Set voice 2 to "Auto" stem direction and centered rests.
3. Set up voice 1 to be a cue voice, with hidden rests and stems pointing up.
4. Insert the cue notes into voice 1.

Turning individual notes into cue notes

PROCEDURE

1. Select one or several notes.
2. Double-click one of the notes.

   The Set Note Info dialog appears. You can also click the "i" button on the extended toolbar, or right-click on a note head and select "Properties" from the context menu to open this dialog.
3. Select Cue from the Type pop-up menu.

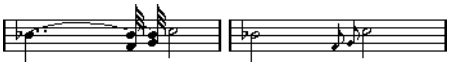


4. Click Apply.

   The settings are applied to the selected notes.
5. Close the dialog.

Grace notes

You can turn any note into a grace note. Grace notes are considered to be notes without lengths. This means that once a note is turned into a grace note it does not affect the rest of the score display in any way.



Before and after converting to grace notes. Note that after the conversion, the grace notes nolonger "interfere" with the interpretation of the other notes.

NOTE

Grace notes are always positioned just before the next note on the staff. If there is no note after a grace note on the staff, the grace notes are hidden!

Creating grace notes manually

PROCEDURE

1. Locate the note for which you want a grace note.
2. Insert one or more new notes just before it.

   The note value and exact position of the note is not important. However, the pitch of course is.

   From here on there are two ways to go:

   - Select the notes and open the Set Note Info dialog, either by double-clicking on one of the note heads or by clicking the “i” icon on the extended toolbar.

     In the dialog, select the Grace note type.
   - Right-click on one of the notes and select “Convert to Grace Note” from the context menu.

     This turns the note into a grace note without opening any dialog.

Grace notes and beaming

If two grace notes are at exactly the same position (the same tick), they are put onto the same stem, as a chord. If multiple grace notes in front of the same note are put on different positions (even if they are only one tick apart), they are grouped under a beam.

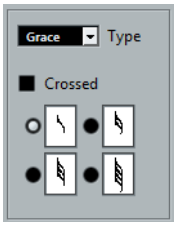
It is possible to have beamed grace notes overlapping a beam of regular notes, as in the example below:

Grace notes in the middle of a group of regular notes

Editing a grace note

PROCEDURE

1. Select one or several grace notes and open the Set Note Info dialog.



2. Select a note value for the stem.
3. Activate Crossed, if needed.

   When this is activated, the stem is crossed by a slanted line, to further indicate that the note is a grace note.
4. Click Apply.

   The settings are applied to the selected notes.
5. Close the dialog.

Converting grace notes to normal notes

PROCEDURE

1. Select the notes that you want to convert.

   If you want to make sure that all notes in the score are normal notes, you can select all notes (using the Select All command on the Edit menu).
2. Double-click on one of the selected grace notes.

   The Set Note Info dialog appears.
3. Select “Normal” from the “Type” pop-up menu.
4. Click Apply.

Tuplets

The regular Display Quantize values do not apply to any other divisions than triplets. To create quintuplets, septuplets, etc., follow the instructions below.

There are two methods for creating tuplets:

- With permanent alteration to the MIDI data. This is the “drawing” mode to use when you want to build the tuplet from scratch. It does not put any demand on the notes’ positions before the tuplet is created.

- As display quantize. This is the method you use when the tuplet is recorded and plays back as you want it, but is not displayed correctly.

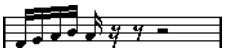
Actually, in the first case, you make permanent alterations and set display quantize settings, all in one go. In the second case you only make display quantize settings.

With permanent change to MIDI data

PROCEDURE

1. Insert as many notes as the tuplet consists of.

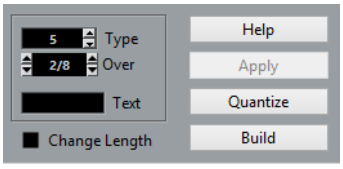
   This would typically be 5, 7 or 9. If the tuplet contains rests, simply leave space for those, but make sure that the current Display Quantize value allows them to be shown.

   Five sixteenth notes, about to be converted to a quintuplet.

2. Select all the notes that make up the tuplet.
3. Select “Build N-Tuplet…” from the Scores menu.

   The Tuplets dialog appears.

4. Set the type of tuplet in the Type field.

   “5” means a quintuplet, “7” means a septuplet, etc.

5. Set the length of the entire tuplet using the “Over” field.
6. Activate Change Length, if needed.

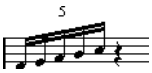
   If you do, the program alters the length of all notes so that they are exactly the note value the tuplet indicates. If you do not, the lengths of the existing notes is not affected in any way.

7. If you want any other text than the standard above the tuplet, enter it into the “Text” field.

   The standard text is simply the number in the type field. If the tuplet is put under a beam the text is put just above it. If there is no beam, the text is found in the middle of a bracket.

8. Click Build.

   The tuplet appears. The notes have now been moved to the tuplet positions and their length might have changed.

9. If needed, edit the lengths and pitches of the notes in the tuplet.

   You can also make various settings for the appearance of the tuplet – see below.

RELATED LINKS

Tuplet display options on page 1400

Without permanent change to MIDI data

PROCEDURE

1. Select the notes in the tuplet group.

   In this case, the notes play back correctly but are not displayed as a tuplet (yet).

2. Select “Build N-Tuplet…” from the Scores menu to bring up the Tuplets dialog.
3. Make settings in the dialog, as described above.
4. Click Quantize.

   Now the tuplet is displayed correctly. You can make additional settings for how the tuplet should appear, as described below.

5. If necessary, adjust the notes.

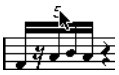
   IMPORTANT

   Lengths and positions in a tuplet group are probably best edited using the info line.

Editing tuplet settings

PROCEDURE

1. Double-click on the text above the Tuplet group to bring up the Tuplets dialog.

2. Adjust the Text setting.
3. Click Apply.

   The changes are applied to the tuplet, without affecting the tuplet type or length.

Grouping

If the Tuplet is a quarter note long or shorter, the notes are automatically grouped under a beam. If it is longer you have to perform the grouping manually.

RELATED LINKS

Grouping on page 1384

Tuplet display options

In the Score Settings dialog, on the Project–Notation Style subpage (Tuplets category), you can find the following settings for tuplets:

Tuplet Brackets

There are three possible settings for this option:

- None: Tuplets never have brackets.
- Always: Tuplets always have brackets.
- …by the head: Brackets are shown only when the tuplets are displayed on the “head side”.

Display Tuplet values by the Beams

When this is activated, tuplets are displayed on the “beam side” of the notes instead of on the note head side.

Suppress Recurring Tuplets

When this is activated, and you have several tuplets of the same type in the same bar, only the first of these is displayed as a tuplet.

Show Tuplet Brackets as “Slurs”

When this is activated, the tuplet brackets are “slur-like” (rounded).

Working with symbols

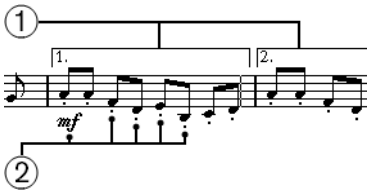
About this chapter

In this chapter you will learn:

- What the different types of symbols are.
- How to insert and edit symbols.
- Details about special symbols.

Background: The different layers

A score page is always made up of three layers – the note layer, the layout layer and the project layer. When you add symbols, these are inserted into one of these layers, depending on the type of symbol. The symbols that have a relation to notes – accents, dynamic markings, slurs, lyrics, etc. – are put in the note layer. Other symbols, such as some types of text, can be inserted either on the layout layer (which is individual for each layout) or on the project layer (common for all layouts). You can change the layer type by right-clicking the symbol and selecting the layer type from the context menu.



1) Layout layer symbols
2) Note layer symbols

Note layer symbols

Let's look at the note layer symbols first.

- Note symbols. These are each tied to a single note. Examples of note symbols are accents and lyrics. When you move the note, the symbol moves with it. The same is true if you cut the note and then paste; the symbol is cut and pasted together with the note.

- Note-dependent symbols. Only a few symbols belong to this category, for example the arpeggio lines. In one way, these behave just like grace notes. They always precede a note or chord. If there is no note “after them” on a staff, they disappear.
- All other note layer symbols (tempo, dynamics, chords, etc.). Their position is related to the bar. Whichever way you edit the notes, these symbols remain unaffected. However, their positions are fixed within a measure. If you for example change the spacing of the bars across the page, this affects the symbols positions.

RELATED LINKS

Setting the number of bars across the page on page 1486
Grace notes on page 1396

Layout layer symbols

Now let’s examine the layout layer symbols. The layout layer is not stored individually for each track, as the other symbols are. Instead it is common to a “set of tracks”. Let’s illustrate this with an example:

You have four tracks that make up a string quartet. You edit them all at the same time and add symbols to the score, both note layer symbols and layout layer symbols.

Now you close the Score Editor and open only one of the tracks for editing. All your note layer symbols are there just as you left them, but the layout layer symbols have disappeared! Don’t worry, close the editor again, and open all four tracks for editing and the symbols are back.

This is due to the fact that the layout layer symbols are part of a “bigger entity” called “layout”. And a layout is something that is stored not per track, but for a group of tracks. Each time you open the same combination of tracks for editing, you get the same layout.

RELATED LINKS

Working with layouts on page 1466

Project layer symbols

Project layer symbols are layout symbols that are present in all layouts.

Using project layer symbols in conjunction with the Arranger mode, you can have playback in the program follow the score – repeats, Da Capos, and endings are played back properly allowing you to hear your compositions as they would be played back by live players.

Why three layers?

There are several reasons for this division into layers:

- Many of the symbols that are in the layout layer can be stretched to span over several staves, or for other reasons make more sense to think of as belonging to a certain group of tracks.
- The layout layer is only one part of the bigger concept of layouts. Layouts allow you to easily extract parts from a full score and perform automatic formatting.
- Typically, you want to display some symbols – repeat bar lines, endings, score titles, etc. – for all layouts in a score. To achieve this, insert them on the project layer.

RELATED LINKS

Working with layouts on page 1466
The available symbols on page 1406

The Symbols Inspector

To display the Symbols Inspector, click the “Set up Window Layout” button on the toolbar and activate the Symbols option.

Customizing the Symbols Inspector

You can customize the appearance of the Symbols Inspector by showing/hiding tabs and by specifying their order in the Inspector.

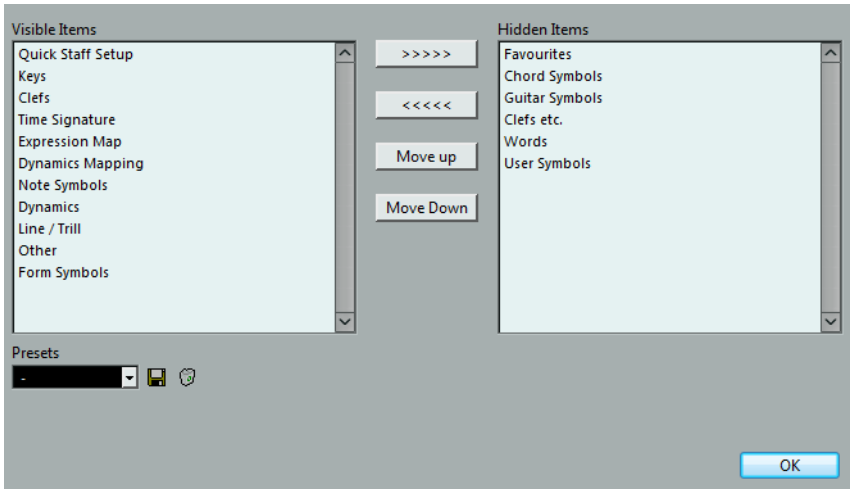
Showing/Hiding Symbols Inspector tabs

If you right-click on any tab in the Inspector, a context menu appears. On this menu, you can directly check (show) or uncheck (hide) elements of the Inspector as desired.

You can also select different preset configurations from the lower half of the menu. To display all Symbols Inspector tabs, select “Show All”.

The Symbols Inspector Setup dialog

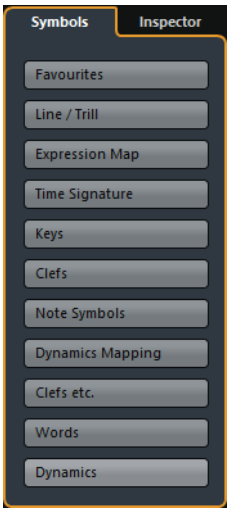
If you right-click on any closed tab in the Symbols Inspector and select “Setup…” from the context menu, a dialog appears. In this dialog you can configure where the separate tabs are placed in the Inspector and save/recall different configurations of the Inspector.



The dialog is divided into two columns. The left column displays the currently visible tabs in the Inspector, and the right column displays the currently hidden tabs.

- You can change the current show/hide status by selecting items in one column and using the arrow buttons in the middle of the dialog to move them to the other column. The changes are reflected directly in the editor.
- You can change the order of the (visible) tabs in the Symbols Inspector with the “Move Up” and “Move Down” buttons.

  The changes are reflected directly in the Score Editor.



A customized Symbols Inspector

- If you click the Save button (disk icon) in the Presets section, you can name the current configuration and save it as a preset.
- To remove a preset, select it and click the trash icon.
- Saved configurations are available for selection from the Presets pop-up menu in the dialog or directly from the Inspector context menu.
- To revert back to the default Inspector settings, right-click on any of the tabs and select “Default” from the context menu.

Working with symbol palettes

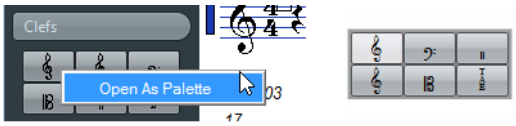
You can open any of the Symbols Inspector sections as separate symbol palettes.

Opening tabs as palettes

PROCEDURE

1. In the Symbols Inspector, open the desired symbols tab.
2. Right-click on any of the symbols of the tab.

   Note that you have to right-click on a symbol. Right-clicking on a tab header opens a different context menu instead.
3. Select “Open As Palette” from the context menu.

   The selected tab is shown as palette.

Moving and handling palettes

Palettes are handled as any window, which means that you can:

- Move a palette to another position by dragging its title bar.
- Close a palette by clicking its close button.

In addition, you can select whether the palette is shown horizontally or vertically, by right-clicking and selecting “Toggle” from the context menu.

The available symbols

The following symbols palettes/tabs are available:

- Quick Staff Setup
- Favourites
- Keys
- Clefs
- Time Signature
- Chord Symbols
- Guitar Symbols
- Expression Map
- Dynamics Mapping

- Clefs etc.
- Note Symbols
- Dynamics
- Line/Trill. Note that the arpeggios, hand indication and strum symbols are all “note-dependent”!
- Other
- Form Symbols. These symbols can be selected for the note layer, the layout layer, and the project layer.
- Words
- User Symbols

When you place the mouse pointer on a symbol, a tooltip shows you information about the function.

RELATED LINKS

Expression maps (NEK only) on page 854
Working with mapped dynamics on page 1512
The Words tab on page 1460
User Symbols on page 1438
Symbol details on page 1430

Setting up the Favourites tab

In the Symbols Inspector, you can find a tab called Favourites. Nuendo allows you to fill this tab with a selection of symbols from other tabs. This way, you have instant access to the symbols you use often:

PROCEDURE

1. Open the Favourites tab.

   If it is the first time you are using this tab, it is empty.

2. Open the tab from which you want to copy a symbol.

   NOTE

   Not all symbols can be placed on the Favourites tab.

3. Right-click on the symbol that you want to add to the Favourites tab and select “Add to Favourites” on the context menu.

   You can also add a symbol to the Favourites tab by [Alt]/[Option]-clicking on it.

4. Repeat this procedure for other symbols that you want to add to the Favourites tab.

   To remove a symbol from the Favourites tab, select “Remove from Favourites” from the context menu or hold down [Alt]/[Option] and click on it.

Important! – Symbols, staves, and voices

Most symbols belong to a staff when inserted. Only note symbols, slurs and ties are an exception. They belong to notes and therefore to voices.

It is extremely important that the correct staff is active when you insert a symbol (if you are editing multiple staves).

If you for example insert a symbol while the wrong staff is active, the symbol might later “disappear” because you edit another configuration of tracks (the track you actually inserted the symbol on might not be opened for editing).

The same is true for note symbols and their relation to voices. Make sure that the correct voice is active when inserting symbols or they might wind up at the wrong position, fermatas may be turned upside down, etc.

Layout symbols work slightly differently. Instead of belonging to a certain staff or voice, they belong to a layout. Since different track combinations use different layouts, this means that if you insert a layout symbol in the score when you are editing two tracks (for example a trumpet and a saxophone part), it is not there when you view each track by itself in the Score Editor. If you want the same symbols to appear in other layouts as well, you can copy the form of one layout to another. If you want a symbol to appear in all layouts, use the Project layer.

Adding symbols to the score

Making space and handling margins

- If you find there is not enough space between staves to add symbols (like for example text), you can separate the staves.
- If you find the score looks crammed after adding symbols, you can use the options in the Auto Layout dialog.

IMPORTANT

Symbols you add outside the margins are not printed!

RELATED LINKS

Dragging staves on page 1490
Auto Layout on page 1494

About the Draw tool

Unlike the other MIDI editors, the Score Editor toolbar does not contain a Draw tool. Instead, the Draw tool is “automatically” selected when you insert symbols. The following applies:

- Normally, the Draw tool is automatically selected when you click on a symbol in the Inspector. However, if the “Double-Click Symbol to get Draw Tool” option is activated in the Preferences dialog (Scores–Editing page), you need to double-click the symbol to get the Draw tool.
- On the same page of the Preferences dialog, you can find an option called “Display Object Selection tool after Inserting Symbol”. When this is activated, the Object Selection tool is automatically selected after you have inserted a symbol.

  If you want to insert a lot of symbols with the Draw tool, you may want to deactivate this option.

Adding note symbols

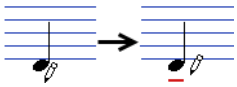
Adding a symbol to one note

PROCEDURE

1. In the Symbols Inspector, open the Note Symbols tab.
2. Click (or double-click) on the desired symbol on the tab.

   As mentioned above, the “Double-Click Symbol to get Draw Tool” preference determines whether you need to double-click. In either case, the Draw tool is selected.
3. Either click on the note or above or below it.

   If you click on the note, the symbol is put in at a predefined distance from the note. If you instead click “above or below” the note, you decide for a vertical position yourself. In either case, the symbol is aligned horizontally with the note. It can later be moved up/down.

   Clicking on a note inserts the note symbol (in this case a tenuto) at a predefined distance from the note head.

   There are three options in the Accents category of the Score Settings dialog (Project page–Notation Style subpage) that affect the vertical positioning of note symbols:

   - Accents above Stems

     When this is activated, accent note symbols are displayed at the stem side of notes instead of the note head.
   - Accents above Staves

     When this is activated, accent note symbols are displayed above the staff, regardless of the stem direction of the notes. This setting overrides the “Accents above Stems” option.

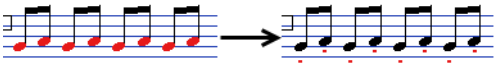
- Center Note-Linked Symbols on Stems
  When this is activated, accents are centered on stems and not on note heads.

Adding a symbol to several notes using the Draw tool

You might for example want to add a staccato symbol to all notes within a few measures.

PROCEDURE

1. In the Symbols Inspector, open the Note Symbols tab.
2. Select the notes to which you want to apply the symbol.
3. In the Symbols Inspector, click on the desired symbol.
4. Click on one of the notes.



The symbol is added to each selected note, at a predefined distance. The symbols can be moved later.

Adding a symbol without tying it to a note

Note-dependent symbols can be entered freely, too. This allows you to add a fermata to a rest symbol for example.

PROCEDURE

1. Make sure that the correct staff is active.
2. Click the symbol so that the Draw tool is selected, as described above.
3. Hold down [Ctrl]/[Command] and click where you want to add the symbol.

Adding other symbols

PROCEDURE

1. In the Symbols Inspector, open the desired symbol tab.
2. Click on the symbol that you want to add.
3. Click once or click and drag somewhere in the score.
   The symbol appears. For many symbols with a length, you can drag to set the length of the symbol directly. The symbol appears with its handles selected (if it uses handles) so that you can change its size directly if you wish.

Press the mouse button – drag – and release!

You can change the size of most of the note symbols and dynamics in a score by right-click on the corresponding object and selecting the desired option from the Size submenu on the context menu.

RELATED LINKS

Changing length, size, and shape on page 1427

About note-dependent symbols

Note-dependent symbols like arpeggios and strum directions must be put in front of a note or they belong to the following note instead (if there is no following note, the symbols are not inserted at all).

Adding text

There are special methods for working with text.

RELATED LINKS

Working with text on page 1447

Adding slurs and ties

Slurs can be drawn in manually or inserted automatically for a group of notes. Ties are usually added by the program but can also be drawn in as “graphic” symbols.

NOTE

There are two types of slurs – “regular” slurs and Bezier slurs (with which you have full control over thickness, curve shape, etc.).

Slurs, ties, and the Display Quantize value

Since a slur or tie “musically” always spans from one note (or chord) to another, the beginning and end of a slur/tie in Nuendo is always related to two notes in the score.

When you draw in a tie or slur, the program uses the Quantize value to find the closest two notes to “attach” the symbol to. In other words, if you want to add the slur/tie to a note at a sixteenth note position, make sure Quantize is set to 1/16th notes or smaller (this is only true for manual drawing in of slurs and ties).

Please note that this does not necessarily mean that the symbol has to start or end exactly above/below two notes. Instead, what it means is that when you use the Layout tool to move the note graphically to adjust the look of the bar, the slur/tie moves with it. The same is true if you adjust the width of the measure – the slur/tie is adjusted accordingly.

NOTE

If you want the end points of the slurs to snap to exact note positions, activate the "Snap Slurs when dragging" option on the context menu or in the Preferences dialog (Scores–Editing page).

RELATED LINKS

Graphic moving of notes on page 1394

Drawing the slur/tie

PROCEDURE

1. Set the Quantize value depending on the positions of the two notes that the slur/tie should span.

   For example, if one of them is at a quarter note position and the other at an eighth note position, set Quantize to 1/8 note or a smaller note value.

2. Click on the correct slur/tie in the Symbols Inspector, so that the Draw tool is selected.

3. Position the mouse close to the first note and drag to a position close to the second note.

   The end points of the slur/tie snap to their default positions – holding down [Ctrl]/[Command] allows you to move the end points freely.

   There are two special functions for inserting a slur or tie that automatically spans from one note to another.

Adding a slur/tie between two notes

PROCEDURE

1. Select two notes.

2. Click the correct slur/tie symbol in the Inspector, so that the Draw tool is selected.

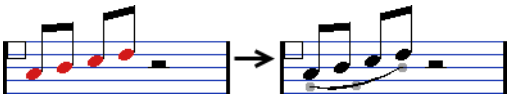
3. Hold down [Ctrl]/[Command] and [Shift] and click on one of the two notes.

   The slur/tie is added between the two selected notes.

Inserting a slur over a selection of notes

PROCEDURE

1. Select a span of notes.
2. Open the Scores menu and select “Insert Slur”.



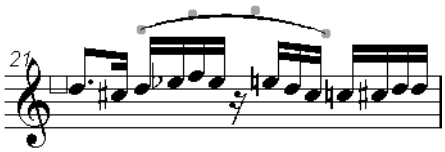
A slur is created, starting at the first selected note and ending at the last.

The Bezier slur

The Bezier slur is a special slur symbol, found on the Dynamics symbol tab. Unlike the regular slur, this symbol is made up of a bezier curve, allowing you to create more advanced curve shapes.

To add a Bezier slur, click on the symbol in the Inspector so that the Draw tool is selected, and click or drag in the score. Clicking creates a Bezier slur of the default length and shape, while dragging creates a straight line.

The default Bezier slur has four curve points – one at each end and two along the curve.



- To move the slur, click on it (but not on a curve point) and drag.
- To resize the slur, click and drag the end points.
- To change the shape of the slur, click on one of the middle curve points and drag in any direction.

Right-clicking on a curve point brings up a context menu with the following options:

Add Points/Reduce Points

Adds another pair of curve points to the Bezier slur. This allows you to create very complex slur shapes. After adding points, there is an additional menu item “Reduce Points” – selecting it removes the additional curve points.

Add Thickness

Makes the Bezier slur thicker.

Reduce Thickness

Makes the Bezier slur thinner.

Hide

This hides the slur symbol.

RELATED LINKS

Hiding/showing objects on page 1480

Creating trills

If you have recorded or entered a trill, Nuendo can help you display this properly:

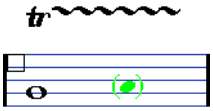
PROCEDURE

1. Select the notes that make up the trill.
2. Right-click on one of the notes and select “Build Trill…” from the context menu.
3. Select an option from the dialog that appears.

   The radio buttons determine how the trill should look. Activate the “Help Note” option if you want an extra note to indicate between which notes the trill should be played.
4. Click OK.

RESULT

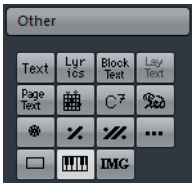
- All notes except the first one (and possibly the second) are hidden.
- The first note automatically gets a display length matching the length of the whole trill.
- If you choose to include a help note, the second note is converted to a “Graphic” note, with brackets but without stem. Otherwise, the second note is hidden, too.
- The trill symbols you selected in the dialog are inserted.



Inserting symbols across staves

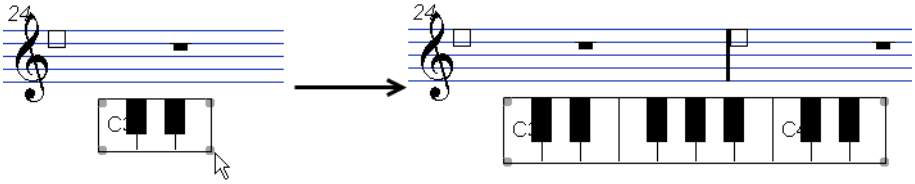
If you hold down [Alt]/[Option] while adding a symbol to one staff in a grand staff, this symbol is put in at corresponding positions on all staves. This allows you for example to insert rehearsal marks, repeats, etc. for all instruments at the same time.

Adding a keyboard symbol



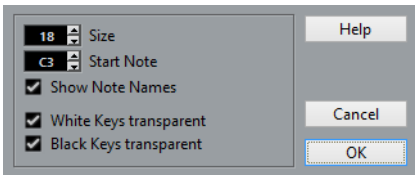
The Other tab contains a piano keyboard symbol, useful in educational scores, for example. The symbol has the following properties:

- To insert the keyboard symbol, select it from the Inspector, click with the Draw tool at the desired position and drag a box to specify the approximate size of the keyboard.
- After you have inserted the keyboard symbol, you can drag its edges to resize it vertically or horizontally.



- If you right-click on an inserted keyboard symbol and select “Properties” from the context menu, a dialog opens allowing you to specify further properties for the symbol.

  You can also double-click on an inserted keyboard symbol to open this dialog.



Size

Governs the width of the keys.

Start Note

This is the leftmost note in the keyboard symbol.

Show Note Names

When this is activated, each C key is displayed with note name and octave (C1, C2, etc.).

White/Black Keys transparent

Activate these if you want the white and/or black keys to be transparent.

Adding guitar chord symbols

A fretboard symbol of a guitar chord can be inserted anywhere in the score.

Guitar symbols are found on the “Guitar Symbols” tab and the Other tab in the Symbols Inspector.

- The Guitar Symbols tab contains all Guitar symbols of the current guitar library. If the symbol that you want to insert is among these, select it and insert it as you would any other symbol, see above.

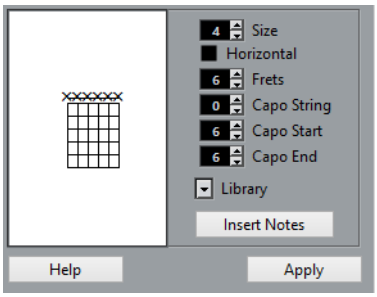
To insert a guitar symbol not present in the guitar library, proceed as follows:

PROCEDURE

1. Open the other tab.
2. Click on the guitar chord symbol, so that the Draw tool is selected.

3. Click in the score, at the position where you want the symbol to appear.

   The Guitar Symbol dialog appears.



   - To put a black dot on any fret and string, click on it.

     To remove it, click again.
   - To add a symbol just above the string, outside the fretboard, click there.

     Consecutive clicks allow you to select between a ring (open string), a cross (do not play this string) and no symbol.
   - To add a capodaster number, click to the left of the symbol.

     Consecutive clicks allow you to step through the possibilities.
   - You can also add a capodaster symbol (a line over the strings), by setting the “Capo String” parameter to a value higher than 0.

     By adjusting the Capo End and Start values, you can create capodaster symbols that span fewer strings.
   - Use the “Size” value field to adjust the size of the chord symbol.
   - If you want the symbol to be horizontal, activate the “Horizontal” checkbox.
   - To display more or fewer frets than the default six, change the “Frets” value.

4. Click Apply.

   The guitar symbol appears in the score.

- Clicking the Insert Notes button inserts the actual notes in the chord into the score.

  You can also right-click on a guitar symbol and select “Insert Notes” from the context menu.

  You can edit the symbol at any time by double-clicking it, changing the settings in the dialog and clicking Apply. Note that you can also access the symbols that you defined in the guitar library by right-clicking a guitar symbol – see below.

NOTE

If you select “Make Chord Symbol” from the context menu, the corresponding chord symbol is displayed above the guitar symbol. This function is very useful when writing lead sheets, for example.

RELATED LINKS

Using the guitar library on page 1417

Using the guitar library

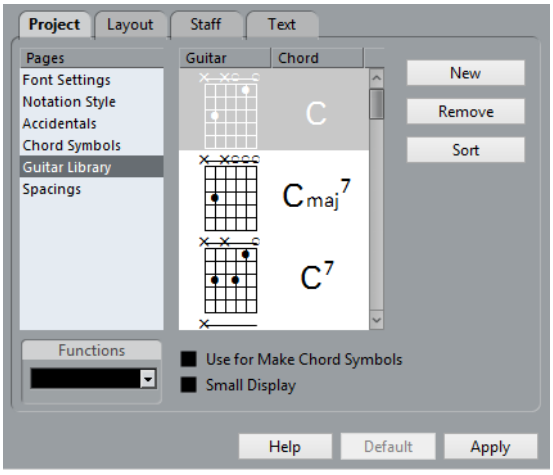
The above method is fine if you only want to add a few chord symbols to your score. If you need a lot of chord symbols, or if you are using chord symbols in a lot of different scores, you can gather all your chord symbols in a “guitar library” instead. This way you do not have to recreate the same chord symbol over and over again.

Defining chord symbols

PROCEDURE

1. In the Symbols Inspector, double-click on one of the symbols on the Guitar Symbols tab to open the guitar library.

   Alternatively, you can open the Score Settings dialog on the Project page and select the “Guitar Library” subpage.



2. To add a guitar chord symbol to the library, click the New button.

   A chord symbol appears in the list to the left.

3. To edit the chord symbol, double-click it in the list.

   This opens the Guitar Symbol dialog, as when editing a chord symbol in the score.

   - The symbol you create is also “interpreted” and its name is displayed to the right of the fretboard symbol.

     This can also be edited by double-clicking if you like.
   - To sort the available symbols in the library according to their root notes, click the Sort button.
   - To remove a symbol from the library, select it in the list and click Remove.
   - To save the current library as a separate file, select “Save…” from the Functions pop-up menu.

     A file dialog appears, allowing you to specify a name and location for the file.
   - To load a guitar library file, select “Load Current Pane…” from the Functions pop-up menu.

     In the file dialog that appears, locate and open the desired guitar library file.

IMPORTANT

Loading a guitar library file replaces the current library!

There are also two additional checkboxes in the Guitar Library dialog:

Option	Description
Use for Make Chord Symbols	When this is activated, and you use the “Make Chord Symbol” function, the program inserts guitar symbols as well as regular chords (if any fitting guitar symbols can be found). If there are several guitar symbols for a certain chord in the guitar library, the first one is used.
Small Display	If this is activated, the chord symbols in the list is displayed in the size they get in the score. If it is deactivated, the symbols are displayed in a larger size, for easier editing.

RELATED LINKS

Using Make Chord Symbols on page 1444

Inserting symbols from the library

Apart from the “Use for Make Chord Symbols” option above, there are two ways to insert symbols from the guitar library into the score:

- Use the Functions pop-up menu on the Project–Guitar Library subpage in the Score Settings dialog, when creating or editing guitar symbols.
- Right-click on a guitar symbol in the score and select a chord symbol from the Presets submenu on the context menu.

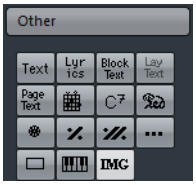
Adding an image file

You can insert image files as symbols into the Score. This allows you to import logos, copyright symbols, images of finger positions, etc.

PROCEDURE

1. In the Symbols Inspector, open the Other tab.

   Image files can be inserted on all three layers.

2. Click the Image File button to select the Draw tool. Click in the score at the position where you want to insert the file.

   A file dialog opens.

3. Locate and select the image file you want to insert.

   The lower section of the Import dialog contains the following settings:

   - To copy the referenced file into the Project folder, activate the “Copy to Project folder” option.

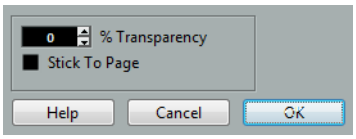
     This is recommended as it makes it easier to manage all files used in a project.
   - If you modify your score, by adding staves for example, the position of an inserted image file changes. If this is not what you want, activate “Stick to Page” to keep it at a fixed position in your staff.
   - The Transparency parameter allows you to set the desired transparency of the image.

4. Click Open to insert the file.

RESULT

The image file is inserted. Its size depends on the printer resolution. However, you can scale the image by dragging its handles. To restore the printer resolution, right-click on the image to open the context menu and select “Snap to Printer Resolution”.

You can modify the settings you made on import by right-clicking the image and selecting “Properties” on the context menu, to open the Image Properties dialog.

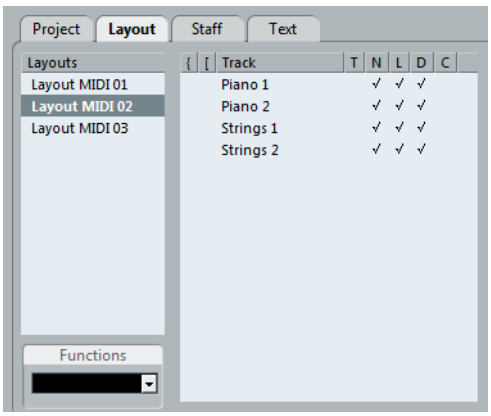


RELATED LINKS

Background: The different layers on page 1402

Using layout symbols

Layout symbols and texts are inserted on the layout layer. When you are editing a layout containing several tracks, you can have inserted layout symbols and texts automatically copied to any combination of tracks in the layout. You decide which staves should display layout symbols and texts by ticking their “L” column in the Score Settings dialog, on the Layout page.



- Any editing you perform to layout symbols and texts is automatically duplicated in the other tracks.
- The display of layout symbols and texts for different tracks can be deactivated at any time.
- Layout symbols and texts can be copied between layouts, by using the Get Form function on the Functions pop-up menu on the Layout page of the Score Settings dialog.

One example of how to use layout symbols and texts:

Let’s say you are editing a full orchestra score, and want rehearsal marks inserted for more than one staff (typically, above each instrument group – brass, strings, percussion, etc.). Now all you need to do is insert the rehearsal marks for one of the tracks. To do so, open the Score Settings dialog on the Layout page, tick the “L” column for the desired tracks/staves, and click Apply.

Using Project symbols

Project symbols are part of the project layer and therefore appear in all layouts. The project layer also contains changes to bar lines (e.g. repeats and double bar lines) and bar number offsets. Typically you use Project symbols when you know you want these shown for all combinations of tracks.

NOTE

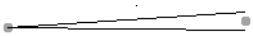
You can also use Project symbols in combination with the Arranger mode to have the program play back according to the score, e.g. repeats, Da Capos and endings.

RELATED LINKS

Scores and the Arranger mode on page 1511

Selecting symbols

Almost all symbols can be selected by clicking on them. For symbols that have a length or size, one or more handles appear.



A selected crescendo

An exception to this are the slurs and ties which can be selected by clicking on the end points or by drawing a selection rectangle.

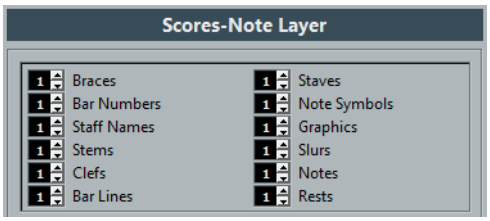
Using the lock layers

Sometimes it can be very hard to click on a symbol or other object in the score without accidentally selecting other symbols nearby. To remedy this, you can assign different types of objects to different “lock layers” (up to three) and instruct Nuendo to “lock” one or two of these layers, making them “unmovable”. Furthermore, you can lock the layout and project layers separately if needed.

Setting up the lock layers

PROCEDURE

1. Open the Preferences dialog and select the Scores–Note Layer page.

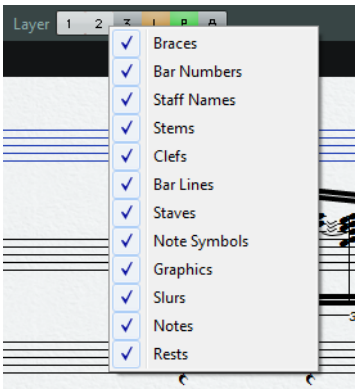


2. Assign each event type to a layer (1, 2, or 3).

   It is a good idea to specify different layers for event types that might conflict “graphically”. For example, you might want to assign bar numbers and note symbols to different layers, if you find that you accidentally move bar numbers when editing note symbols and vice versa.

3. Click OK to close the dialog.

   Alternatively, you can right-click on one of the Layer buttons (1-2-3) on the extended toolbar to bring up a pop-up menu, showing which object types are associated with that layer.



A checkmark for an object type means it belongs to that layer. If no checkmark is shown, you can select the object type from the pop-up menu to move it to that layer.

Locking a layer

To “lock” a layer, click on its lock layer button.

In this figure, layer 2 is locked. Event types assigned to layer 2 cannot be selected, moved, or deleted.

Visual indication of the layers

Objects belonging to locked note layers are “grayed out” in the score. This makes it very easy to find out which object belongs to which layer – perhaps especially useful for the layout and project layers. For example, to quickly spot all objects in the layout layer, lock all other layers by clicking their buttons. Now, only layout layer objects are shown normally; all other objects are grayed out.

Moving and duplicating symbols

There are four ways to move and duplicate symbols:

- By dragging them with the mouse (see below).
- By using the computer keyboard (moving only).
- By using the bar handles.
- By using the Paste Attributes function (duplicating note symbols only).

RELATED LINKS

Moving by using the computer keyboard on page 1425
Moving and duplicating with the bar handles on page 1425
Copying settings between notes on page 1384

Moving and duplicating by using the mouse

This is done much as with other objects in Nuendo. The following rules apply:

- Note symbols and note-dependent symbols move with the notes/chords they belong to. In other words, if you move the note/chord, the symbols move with it/them.
- Note symbols (like accents and lyrics) can only be moved vertically. Other symbols (like braces and brackets) can only be moved horizontally.
- All other symbols without handles can be moved freely. If you hold down [Ctrl]/[Command], movement is restricted to one direction only.
- If the symbol has one or more handles when it is selected, do not drag it by the handles, or you change its shape instead of moving it.
- Slurs and ties are an exception, as they can only be moved by first dragging one handle and then the other. However, if you use the Layout tool to move the notes they belong to, or if you change the measure width, they are adjusted automatically.
- Duplicating is done by moving with [Alt]/[Option] pressed, as always in Nuendo. Slurs, ties, and bar lines cannot be duplicated with this method.

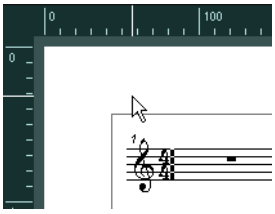
There are two features to help you position symbols (and other score objects) correctly: the rulers and the Position Info window.

RELATED LINKS

Graphic moving of notes on page 1394

The rulers

Unlike other editors, the Score Editor does not have a meter/time position-based ruler. Instead, its rulers are “graphical”, i.e. they indicate the actual x-y position of objects (with “zero” at the upper left corner).



- The current pointer position is indicated by thin lines in the rulers.
- To hide the rulers, right-click on a ruler and select “Off”.

  This pop-up menu can also be found above the scrollbar at the far right.
- To display the ruler again, open the pop-up menu above the scrollbar at the far right and select one of the units (inches, centimeters, or points).

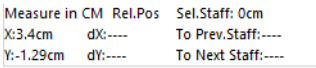
  This setting also affects the units used in the Position Info window (see below).

The Position Info window

If you need to fine-tune the graphical positions of symbols and other objects, you should use the Position Info window. This makes positioning easier in two ways:

- You get a numerical indication of the exact position of the mouse pointer (and any object you are dragging).
- You can move objects or staves by typing in position values.

You display the Position Info window by clicking in the ruler.



The window contains the following settings and values:

Measure in

Click this label to change units for the Position Info window. You can toggle between Inch, cm, and pt. This choice also affects the units used in the rulers.

Abs. Pos./Rel. Pos

Click this label to select whether X-Y position values are “absolute” (referring to the upper left corner of the current page) or “relative” (referring to the upper left corner of the active staff).

X, Y

When a single object is selected, these values show the horizontal and vertical position of this object.

When no objects or several objects are selected, these values show the current horizontal and vertical position of the pointer.

When a single object is selected, you can click on these values and type in a new position for the object.

dX, dY

When you are moving an object, these values indicate the horizontal and vertical distance you have moved it.

You can click and type in values to move the object(s) by the specified distances.

Sel. Staff

If “Abs. Pos” is selected (see above), this value shows the distance from the top of the score page to the top of the active staff.

You can click and type in a value to move the active staff. If “Rel. Pos” is selected, this value is always 0, since vertical positions are related to the top of the active staff!

To Prev Staff

The distance between the active staff and the staff above it. Clicking and typing in a value moves the active staff.

To Next Staff

The distance between the active staff and the staff below it. Clicking and typing in a value moves the staves below the active staff.

Dragging symbols across staves

If you drag a symbol across the staves, you can see how the “active staff” indicator to the left follows the mouse pointer. Use this as an indication to make sure that symbols end up in the correct staff.

- If you are editing several tracks at the same time, and want to make sure that a symbol is not accidentally moved to another track when you drag it vertically, activate the Lock “L” button on the extended toolbar.

  When this is activated, you cannot move symbols across staves by dragging.

Moving by using the computer keyboard

In the Key Commands dialog, you can assign key commands for moving symbols, notes, or rests graphically. The commands are found in the “Nudge” category and are called “Graphical Left”, “Graphical Right”, “Graphical Top”, and “Graphical Bottom”.

Selecting an object and using one of these commands is the same as dragging them with the Layout tool, but this method offers higher precision.

Moving and duplicating with the bar handles

This function allows you to move or copy the contents of a whole bar to one or several other bars. You can select which elements in the bar will be included in the operation.

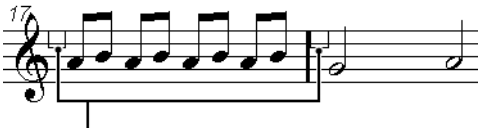
PROCEDURE

1. Make sure that the filter bar is visible.

   If the filter bar is not visible, click the “Set up Window Layout” button on the toolbar and activate the Filters option.

2. On the filter bar, make sure that the “Bar Handles” option is activated.

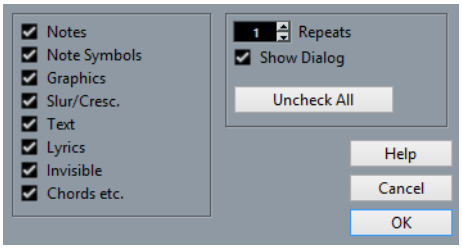
   Now, each bar in the score is shown with a handle in the upper left corner.



Bar handles

3. Double-click on the handle of the bar from which you want to copy or move symbols.

   The Bar Copy dialog appears.



4. Make sure that only the symbol types that you want to move/copy are checked.
5. If you have several subsequent bars to which you want to copy symbols, set the “Repeats” value to this number of bars.

   If you only want to copy symbols from one bar to another, make sure that “Repeats” is set to 1. This option is only available for copying, not for moving.
6. If you want this dialog to appear every time you perform the move/copy operation, activate “Show Dialog”.
7. Click OK to close the dialog.
8. To copy the specified event types to another bar, hold down [Alt]/[Option], click on the bar handle of the first bar and drag it to the “target” bar.

   To move the event types instead of copying them, drag the bar handle without holding down [Alt]/[Option].

   If you activated “Show Dialog”, the Bar Copy dialog appears, allowing you to confirm your settings.

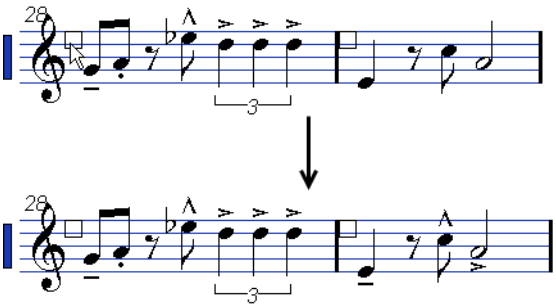
   Click OK to close the dialog and perform the operation.

Result

If you activated “Note Symbols”, the note symbols are copied from the “source” bar and pasted onto notes at the same positions in the “target” bar. If there is a note symbol for a certain note in the “source” bar, but no note at the corresponding position in the “target” bar, the symbol is ignored.

The actual positions of notes are used as a basis for this operation – not the displayed positions.

If you copy the note symbols from the first bar to the second bar…



…only symbols that find corresponding note positions in the second bar are copied.

- If you activated other types of symbols, these are simply moved to the same graphical position in the “target” bar.
- If you set “Repeats” to a number larger than 1, the same symbols are pasted into that number of bars (starting from the one you drag the bar handle to).
- If you do not hold down [Alt]/[Option] when dragging the bar handle, the symbols (and other event types specified in the dialog) are removed from the “source” bar.

IMPORTANT

If there already are symbols (or other objects) of the specified types in the “target” bars, these are removed.

Moving note symbols

Note symbols, slurs and ties all have “default positions”. This determines the vertical distance between the note head(s) and the symbol.

- You can manually adjust the vertical positions of individual symbols, but if you move or transpose their notes, the symbols are automatically reset to their default positions.

  This also ensures that note symbols and slurs are positioned sensibly when you change the Display Transpose settings.
- To reset the vertical positions of note symbols and slurs in a score, right-click on the corresponding object and select “Default position” from the context menu.

Changing length, size, and shape

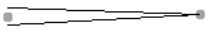
You can change the shape of any symbol that has a length.

Changing the length of a symbol

PROCEDURE

1. Select the symbol.

   The handles appear.

   Symbols with a length have two handles when selected.

2. Drag one of the handles.

   You may be restricted to vertically or horizontally only, depending on the type of symbol.

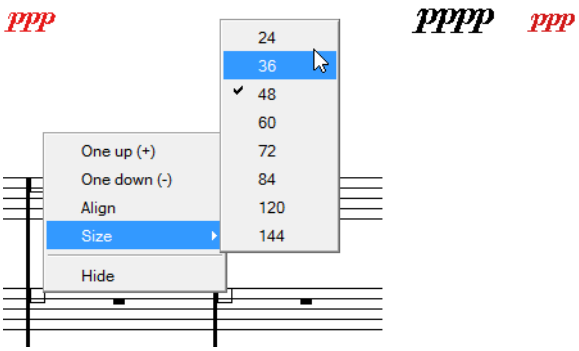
   IMPORTANT

   In the Preferences dialog (Scores–Editing page), there is a preference called “Keep Crescendo Symbols Horizontal”. When this is activated, crescendo and diminuendo symbols are never slanted.

Resizing note symbols and dynamics

PROCEDURE

1. Right-click on a dynamic or note symbol.
2. Select the desired option from the Size submenu.



The size of the symbol changes accordingly.

Altering the shape and direction of slurs and ties

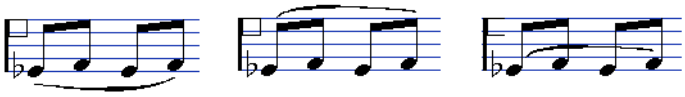
This section describes how to alter the “regular” slur and tie symbols.

There are two types of slurs and ties in the Symbols Inspector. The up/down variation of each actually represent the same symbol but with different initial direction. You can perform the following editing to slurs and ties:

- By dragging the middle handle up/down and left/right you can change the shape of the curve.

- By selecting a slur or a tie and clicking the “Flip” symbol on the extended toolbar or by selecting “Flip Position” on the context menu, you can change the direction and positioning of the slur or tie.

  Actually, there are three “modes” for a slur or tie. You step through these three modes by clicking the button.



- By dragging the end points of a slur or tie, you can change its shape without affecting its “relation” to the notes it belongs to.

  In other words, the end point of the slur/tie keeps its relative distance to that note when the note is moved with the Layout tool or when the measure width is adjusted.

- By holding down [Ctrl]/[Command] and dragging the end points of a slur or tie, it can be detached from the notes it belonged to.

  NOTE

  To restore the default shape of a symbol, right-click on it and select “Default position” from the context menu.

- To change the default shape and spacing of slurs and ties, open the Score Settings dialog on the Project–Spacings subpage and edit the “Slur’s Start & End Distance from Note Head” and “Slur’s Middle Distance from Note Head” settings.

  These settings are used for all new slurs and ties you create, as well as for all existing slurs for which you have not manually changed the shape.

RELATED LINKS

The Bezier slur on page 1413
Moving note symbols on page 1427

Deleting symbols

This is done as with all other objects in Nuendo, either with the Erase tool or by selecting it and pressing [Delete] or [Backspace].

Copy and paste

All symbols except those on the Layout and Project layers can be copied and pasted just as any other object in Nuendo. The following applies:

- Symbols that were tied to notes (e.g. accents) become “free-floating” objects when pasted.

  That is, they are not tied to any note any more. If this is not what you want, consider copying with the bar handles.

RELATED LINKS

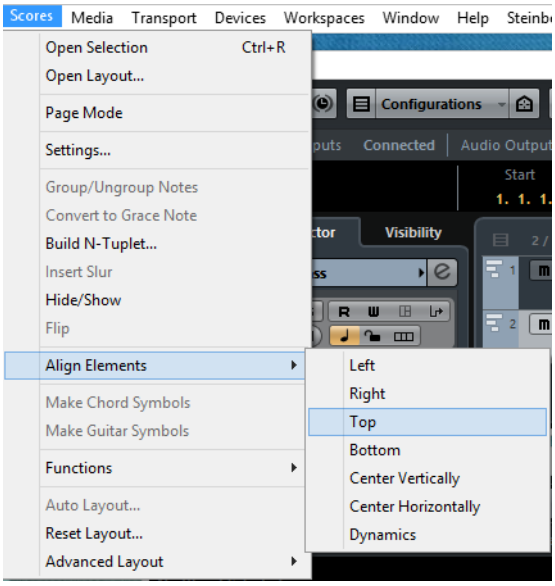
Moving and duplicating with the bar handles on page 1425

Alignment

Symbols can be aligned as in drawing programs.

PROCEDURE

1. Select all objects that you want to align.
2. Open the Scores menu and select an option from the Align Elements submenu.



IMPORTANT

Note symbols like staccato and accents can only be aligned horizontally.

The “Dynamics” option is a special function for aligning dynamic symbols.

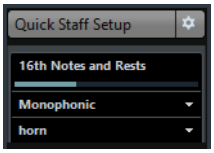
RELATED LINKS

Aligning dynamics on page 1433

Symbol details

This section further describes some of the symbol tabs.

The Quick Staff Setup tab



This tab combines the basic settings for Display Quantize, staff mode, as well as staff presets for quick access.

RELATED LINKS

Display Quantize values on page 1352
Setting up the voices on page 1361
About the polyphonic presets on page 1363

The “Clefs etc.” tab

Clefs

You can insert a clef symbol anywhere in the score. This has an effect on the notes, just as the first clef on the staff has. And just as with the first clef, the type is selected from the Edit Clef dialog that appears when you select the Clef symbol and click in the Score.

When you double-click on an existing clef, the Edit Clef dialog appears again, allowing you to change the type. When you right-click on a clef, you can change the type from the context menu.

Keys

Inserting a key change is similar to inserting a new clef (see above).

NOTE

In the dialog that appears when you insert a key change, you can also insert Display Transpose changes.

Time signatures

You can insert a time signature symbol at the beginning of any bar. Inserting a new time signature inserts a change on the signature track.

When you select the Time Signature symbol and click in the score, the Edit Time Signature dialog opens, allowing you to specify the time signature. When you double-click on an existing time signature symbol, the same dialog appears, allowing you to change the type. When you right-click on a time signature, you can change the type on the context menu.

- You can select a font and size for time signatures in the “Font Settings” subpage of the Score Settings dialog (Project page).
  The default font for this is the included “Steinberg Notation” font.

RELATED LINKS

Inserting and editing clefs, keys, or time signatures on page 1344
Setting clef, key, and time signature on page 1303
Editing the key on page 1308
Editing the time signature on page 1304

The Dynamics tab

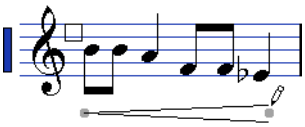
There are dynamic symbols ranging from ffff to pppp, plus “special” dynamic symbols such as sforzando, fortepiano, etc.

- By selecting a dynamic symbol and clicking the “+” and “-” buttons on the extended toolbar, you can quickly edit dynamics in the score.
  Use this feature to step between pppp, pp, p, mp, mf, f, ff, fff, and ffff.
- You can also right-click on a symbol and select “One up” or “One down” on the context menu.
  As above, these commands can be used to step between pppp, pp, p, mp, mf, f, ff, fff, and ffff.
- To change the size of a dynamic symbol, right-click on it and in the context menu, select an option from the Size submenu.
- In the Line/Trill tab you can find a line symbol which allows you to create the following type of change in dynamics:
  ppp ———————— *ff*

Crescendo and diminuendo (decrescendo)

In the Dynamics tab, there are three kinds of crescendo symbols: regular crescendo, regular diminuendo and a “double” crescendo (diminuendo–crescendo).

- To insert a crescendo (<) or diminuendo (>), select the corresponding symbol from the tab and drag from left to right.



- If you draw a crescendo symbol from right to left, the result is a diminuendo symbol, and vice versa.
- To insert a crescendo-diminuendo (< >) symbol, select the double crescendo symbol from the tab and drag from left to right.
- To insert a diminuendo-crescendo (> <) symbol, select the double crescendo symbol from the tab and drag from right to left.

- When you have inserted a crescendo or diminuendo symbol, you can move it and resize it by dragging its handles.
- The “dynamic crescendo/diminuendo” symbol (p < f) is special in that it actually affects the velocity of the notes as they are played back.
- If the “Keep Crescendo Symbols ‘Horizontal’” option is activated in the Preferences dialog (Scores–Editing page), crescendo/diminuendo symbols are never slanted when you draw them, but stay horizontal.

  Also, this option prevents you from accidentally dragging an endpoint up or down when moving the symbol.
- It is also possible to “flip” crescendo symbols, by selecting the option in the context menu or by clicking the Flip button on the extended toolbar.

RELATED LINKS

Working with mapped dynamics on page 1512

Aligning dynamics

There is a special command for aligning dynamic symbols (including crescendos) horizontally. Unlike the regular align function, aligning dynamics takes the “baseline” of the dynamic letters into account, aligning them as text rather than as graphic symbols.

PROCEDURE

1. Select the dynamic symbols that you want to align, e.g. pp and a crescendo.
2. Right-click on a selected symbol and select the “Align” function on the context menu.

   This aligns all selected dynamics (except slurs and beziers) horizontally.

   You can also align the dynamic objects by opening the Scores menu and selecting “Dynamics” from the Align Elements submenu.

RELATED LINKS

Alignment on page 1430

The Line/Trill tab

Octave Symbols

The octave symbols (8va and 15va) act as a “local display transpose” – they shift the display of the score one/two octaves down.

- By dragging the end of the dotted line, you can specify exactly which notes are affected by the octave symbol.

  Only notes beneath the dotted line are display transposed.

- You can also right-click on the octave symbol and select the “Extend (+)” or “Reduce (-)” command to extend it to the next chord or to reduce it.

RELATED LINKS

Transposing instruments on page 1311

Tuplet group symbols

These are “graphical” tuplet group symbols, as opposed to the “real” tuplets.

- After inserting a tuplet group symbol, you can double-click on its number and enter any number from 2 to 32.
- In the Score Settings dialog (Project page–Notation Style subpage) you can specify globally how tuplets are displayed.

  You can also select a font and size for the tuplet numbers in the Font Settings subpage.
- You can also right-click on the tuplet group symbol and select the “Extend (+)” or “Reduce (-)” command to extend it to the next chord or to reduce it.

Vertical symbols

The vertical symbols in the Line/Trill tab are “note-dependent”. This means that they must be inserted in front of a note.

RELATED LINKS

Note layer symbols on page 1402
Grace notes on page 1396

The Other tab

RELATED LINKS

Working with text on page 1447
Inserting chord symbols on page 1442

Pedal down and up symbols

When you insert a Pedal down or up symbol, you also insert an actual MIDI event (damper pedal, control change 64) at that position. Similarly, inserting or recording a damper pedal event in another editor displays a pedal down/up symbol in the score.

- If the “Hide Pedal Markers” option is activated in the Score Settings dialog, Project–Notation Style subpage (Miscellaneous category), all pedal markers are hidden.

  Use this if you have recorded a lot of damper pedal messages, but do not want these to show in the score (for example if you are writing for an instrument other than piano).

A pedal down/up symbol combination can be displayed as “Two Symbols”, ““Ped.” + Bracket” or as “Bracket only”. Just right-click on the pedal symbol and choose an option from the context menu. You can also set this in the Score Settings dialog, on the Project–Notation Style subpage (Miscellaneous category).

Repeats

Repeat signs (one and two bars) have a special feature: if you hold down [Shift]-[Ctrl]/[Command] when entering them, notes in the bars they relate to are automatically hidden.

RELATED LINKS

Hiding/showing objects on page 1480

Box (rectangle) symbol

This is a “generic” box symbol, which may be useful for different purposes. If you double-click on a box, a dialog opens in which you can specify whether the box is transparent or not, and whether the border is visible. This dialog can also be opened by selecting “Properties” from the context menu.

The box symbol is available on the “Other” and “Layout” tabs.

The keyboard symbol

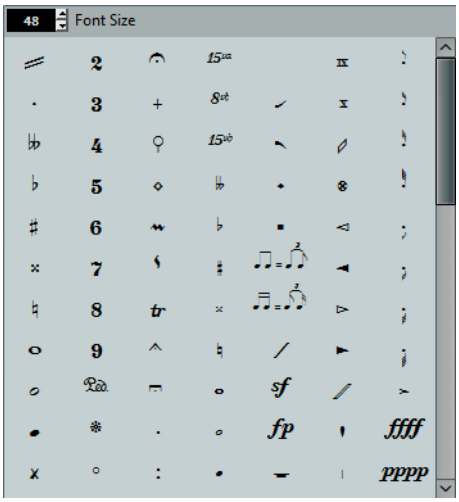
The Other tab contains a piano keyboard symbol, useful in educational scores, for example.

RELATED LINKS

Adding a keyboard symbol on page 1415

Additional symbols

If you click the “Other Symbol” button and then into the score, the “Select Symbol” dialog opens. Here you can choose note heads, accidentals and rests that work only as drawing elements, i. e. they do not insert any note data into the track. They do not affect MIDI playback! You can set the desired symbol font size directly in the Font Size field.



The Form Symbols tab

Rehearsal marks

The following types of rehearsal marks are available: numbers and letters.

When you place the first of these in the score, it is labeled 1 or A (depending on which you choose on the tab), the second is then automatically labeled 2 or B, the next 3 or C, etc. If you delete one, the labeling of the others is shifted automatically so that they always make up a complete series of numbers or letters.

- You can select a font and size for rehearsal marks on the Project Text tab of the Project–Font Settings subpage in the Score Settings dialog.

  Use the Frame option to add a box or an oval around the rehearsal mark.

- Rehearsal marks can be added automatically at the start position of each Marker in the project with the “Marker track to Form” function.

Da Capo and Dal Segno symbols

The “D.C.”, “D.S.”, and “Fine” symbols provide a quick way to insert some common play directions into the score. The symbols are text symbols – you can adjust which font is used on the Project page (Font Settings subpage) of the Score Settings dialog.

- To have these symbols actually affect playback, insert them on the Project layer and use the Arranger mode.

RELATED LINKS

Settings for other fixed text elements on page 1464
Scores and the Arranger mode on page 1511

Endings

There are two types of endings, closed (“1”) and open (“2”). Both can be stretched to any length or height by dragging the handles. You can also double-click or right-click the existing number and enter any text you like.

You can insert endings in all layers. Which one to choose depends on the score; while it is handy to insert endings once and for all as Project symbols, this does not allow you to make individual adjustments for the different parts.

- You can right-click an ending symbol and select the “Extend (+)” or “Reduce (-)” command to extend the symbol to the next chord or to reduce it.

Tempo Indicator symbol

This symbol allows you to insert the current tempo according to the tempo track. In other words, to make this symbol display a certain tempo, insert the value on the tempo track.

Normally this symbol shows the number of beats (quarter notes) per minute, but if you double-click or right-click it, you can select any note value. The number then changes accordingly.

Tempo change according to note values symbol

This symbol allows you to specify a tempo change as a change from one note value to another. The example above would mean “lower the tempo by a third”.

To change the note value for either symbol, double-click or right-click it and select the desired note value from the context menu.

User Symbols

The User Symbols tab lets you create your own graphic symbols and use these in the score.

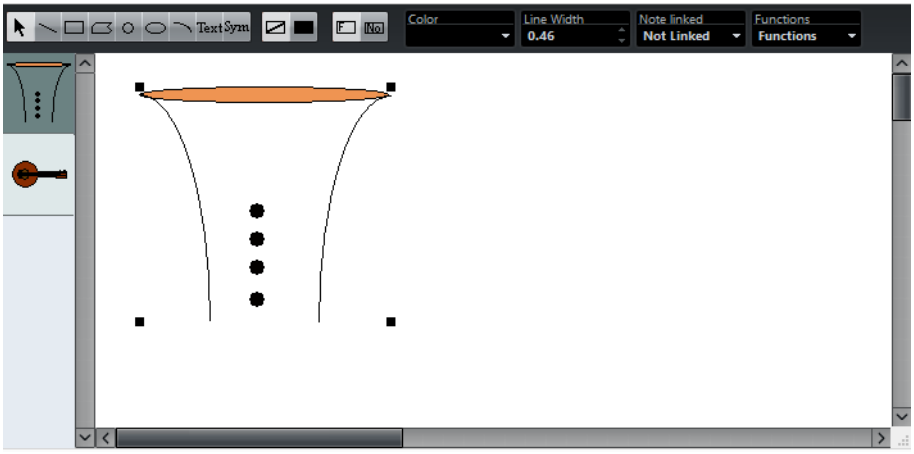
Creating a user symbol

Initially, the User Symbols tab is empty. To create symbols you use the User Symbols editor:

PROCEDURE

1. Double-click on the empty symbol field on the tab.

   The User Symbols editor opens. You can also right-click on an empty symbol field and select “Edit…” to open the same dialog.



2. Open the Functions pop-up menu and select the desired zoom factor from the View submenu.

   Often you want to work at a reasonably high zoom factor when drawing and editing symbols.

3. Use the tools and functions to draw a symbol.

   The available tools are listed in the table below.

   When you are finished, you can close the editor and insert the symbol into the score, or you can create more symbols:

4. Select “New Symbol” from the Functions pop-up menu.

   An empty symbol field appears in the section to the left of the drawing area – this section corresponds to the actual User Symbols tab, showing all symbols that you have created.

5. Click the new empty symbol field on the left to make sure that it is selected.

   The drawing area is cleared.

6. Continue creating new symbols this way.

   - You can edit existing symbols at any time by selecting them to the left and using the tools and functions.

     Any changes you make are automatically stored in the User Symbols tab for the project. You can also export symbols for use in other projects, see below.

   - To insert a user symbol into the score, click on it on the tab and then click at the desired position in the score.

The User Symbols editor – tools and functions

The toolbar contains the following tools and settings, from left to right:

Object Selection

Use this to select objects – press [Shift] to select more than one. Click and drag to move objects – press [Ctrl]/[Command] to drag vertically or horizontally only or press [Alt]/[Option] to copy.

To delete an object, select it and press [Backspace] or [Delete].

Line

Draws a straight line.

Rectangle

Creates a rectangle. You can fill this with the Fill button if needed.

Polygon

Creates a polygon – click where each corner of the polygon should be and close the figure by clicking outside the drawing area.

Circle

Creates a circle. You can fill this with the Fill button if needed.

Ellipse

Creates an ellipse. You can fill this with the Fill button if needed.

Arc

Creates an arc.

Text

Allows you to insert text objects. Clicking with this tool in the drawing area opens a dialog where you enter the text, specify font, style, etc.

You can double-click on a text object you have inserted to change its text or settings.

Symbol

Clicking with this tool brings up a dialog where you can select any of the existing score symbols and incorporate this (at the desired font size) into your own symbol.

Set Color of Frame

When this is selected, the Color pop-up menu is used to select the color for the object frame.

Set Color of Fill

When this is selected, the Color pop-up menu is used to select the fill color for objects (if Fill is selected).

Fill

Click this if you want the object to be filled – you can then select a Fill Color for it from the Color pop-up menu.

Don't Fill

Click this if you do not want the object to be filled.

Color

Selects Frame or Fill Color for objects. The "Select Colors…" menu item brings up a standard color dialog.

Line Width

Allows you to change the line width used for the selected object.

The Note Linked pop-up menu lets you create symbols linked to note positions. This affects the whole symbol, not a selected graphic object:

Not Linked

The symbol is not linked to notes.

Linked/Left

The symbol is linked to a note, appearing to the left of the note.

Linked/Center

The symbol is linked and centered to a note.

Linked/Behind

The symbol is linked to a note, appearing to the right of the note.

The Functions pop-up menu contains the following items (some of these can also be accessed on the context menu for the User Symbols tab):

New Symbol

Adds a new empty symbol to the tab (and to the symbol list to the left in the editor).

Delete Symbol

Deletes the current symbol from the tab.

Export User Symbols…

Allows you to save the current tab with all available symbols as a separate file on disk.

Import User Symbols…

Loads settings for a complete tab from disk. Note that this replaces the current settings.

Export/Import Symbol…

Lets you save or load individual symbols to/from disk. Importing a symbol replaces the current symbol on the tab.

Delete

Deletes the selected object(s).

Select All

Selects all objects in the current symbol.

Transform – Scale Symbol

Lets you scale (resize) the selected object by specifying a percentage.

Transform – Mirror horizontal/vertical

Mirrors the selected object along the horizontal or vertical axis.

Transform – Flip ±90

Rotates the selected object by + or – 90 degrees.

Draw – Group

Groups the selected objects so that they are treated as one.

Draw – Ungroup

Ungroups the selected group.

Draw – Bring To Front/Send To Back

These items let you arrange the objects by moving them to the front or the back.

Align – Left/Right/Top/Bottom/Center Vertically/Center Horizontally

Aligns the selected objects to each other.

Display

Sets the zoom factor for the drawing area.

Working with chords

About this chapter

In this chapter you will learn:

- How to enter chord symbols manually and automatically using the “Make Chord Symbols” feature.
- Which settings can be made for chord symbols.

Inserting chord symbols

To insert chord symbols in the score, you can insert them manually by using the Chord Symbol button in the Inspector. You can also let Nuendo analyze an existing recording and create the chord symbols.

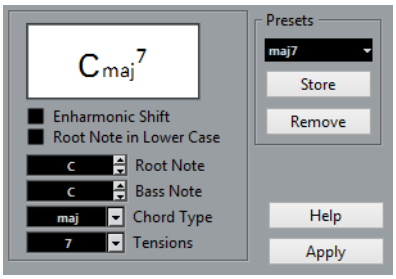
Manually

To specify and enter a chord symbol, proceed as follows:

PROCEDURE

1. Open the Other tab and select the Chord Symbol button.
2. Click in the score at the position where you want to insert the chord symbol.

   The Edit Chord Symbol dialog opens.



3. Enter the root note in the Root Note field.

   You can either type in a chord letter or step through the chord letters using the up/down arrows to the right.

4. In the “Chord Type” field, specify a chord type.

   You can either enter it directly (for example, by typing a “7”) or select an option from the pop-up menu (click the arrow button to open it).

5. If you wish, specify a tension in the Tension field.

   Again, this can be done by typing or by using the pop-up menu. However, there are some special display options which you can only get by typing (see the table below). You might also want to add some text here (such as “no third”). You can also select the basic tensions from the pop-up menu, and then add special options by typing.

6. If you want to have a special bass note (e.g. a C major with a D bass note), set the Bass Note pop-up menu to this note (this cannot be the same as the root note).

   The program “remembers” the relation between root and bass note, so that if you change the root note, the bass note follows.

7. If you want the root note to be displayed in lower case, activate the “Root Note in Lower Case” checkbox.

8. If needed, activate the “Enharmonic Shift” option.

9. Click Apply.

   The chord symbol appears in the score.

   To open the Edit Chord Symbol dialog for an existing chord, double-click the symbol.

   You can also right-click the symbol and select “Properties” on the context menu to open the dialog.

Tension Field

Character	Description	Example	Result
()	The tensions are enclosed in brackets.	9(#5)	C9(♯5)
/	The tensions are separated by a slash sign.	9/#5	C9/♯5
|	The tensions are placed above one another.	9|#5	C9♯5
You can also combine several options. This is a combination of two options, along with a space to put the “9” above the “5”. Note that only one “(“ sign is needed when the “|” option is used.		(9|#5	C(9♯5)

Using Make Chord Symbols

If you have already recorded the chords for a project, Nuendo can analyze them and create chord symbols:

PROCEDURE

1. Open the recording in the Score Editor.

   If you want the chords to be inserted on another track, you can create an empty part on that track and open it along with the recording.

2. If you like, make display settings for the chords. These settings are available in the Score Settings dialog, on the Project page (Chord Symbols subpage).

   You can change all these settings after you inserted the chords as well.

3. Select the notes for which you want chord symbols to be created.

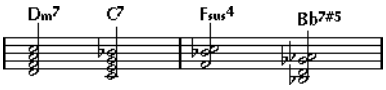
   If you want chord symbols to be created for all chords on the track, use the Select All function on the Edit menu.

4. Use the arrow keys to make the desired staff active.

   This should be the staff on which you want the chord symbols to end up.

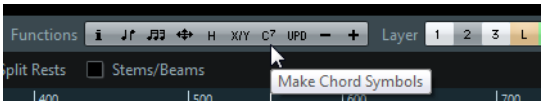
5. On the Scores menu, select “Make Chord Symbols”.

   The chords appear. They can be moved, duplicated and deleted as any other symbol. You can also double-click on a chord symbol to edit it in the Edit Chord Symbol dialog (in the same way as when creating chords manually – see above).

   A staff after using Make Chord Symbols.

   Instead of using the “Make Chord Symbols” menu item, you can click the “Make Chord Symbols” button on the extended toolbar.

   If the “Use for Make Chord Symbols” option is activated on the Project–Guitar Library subpage of the Score Settings dialog, guitar chord symbols are added as well (if the guitar library contains any guitar symbols that match the chords).

RELATED LINKS

Adding guitar chord symbols on page 1416

About the analysis

The MIDI chords are expected to be played in their most basic inversion. If not, an extra bass note is added. For example, the notes CEG are interpreted as C major, but GCE is interpreted as C major with a G bass note. If you do not want any interpretation of the inversion (i.e. no added bass notes) hold down [Ctrl]/[Command] while selecting Make Chord Symbols.

All selected notes on all staves are taken into consideration. Whenever there is any change on any staff, the notes are reinterpreted and a new chord symbol is added. This means you should probably avoid having the melody track in the Score Editor when you use Make Chord Symbols, or you get a lot more chords than you expect, possibly with strange tensions.

In addition to the above, the Quantize value is used. At the most, there is a new chord at each quantize position.

There must be at least three notes at a certain position for the program to interpret it as a chord. Also some combinations of notes simply do not make any sense to the program and do not produce any chords.

The analysis method is not perfect since the same set of notes can be interpreted differently depending on context. Some editing may be required. If you record the track solely to create chords automatically, play the chord as simple as possible, in the correct inversion, without added octaves, etc.

The Current Chord Display

Nuendo features a handy chord recognition function that helps you identify chords in the Score Editor note display. To find out which chord is formed by simultaneously played notes, place the project cursor over the notes. All notes currently “touched” by the project cursor are analyzed and the Current Chord Display in the status line shows you which chord the notes form.

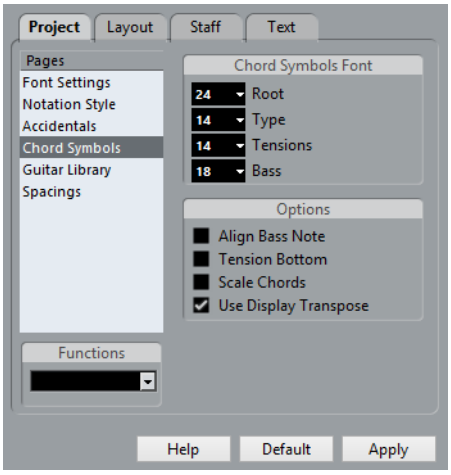
Global chord settings

In the Score Settings dialog on the Project page (Chord Symbols subpage), there are several global settings that affect how chords are displayed. These settings affect all chords in the project.

NOTE

There are several options in the Preferences dialog (Event Display–Chords) that also affect how chords are displayed.

Chord Symbols



Chord Symbols Font

- Use the four size value fields to select sizes for the root, the type, the tension, and the bass of a chord.

  You can type in values or use the pop-up menus. Normally, you would want the “Root” size to be the largest and the “Tension” size to be the smallest.

Options

- If you want the root note to be aligned with the bass note, so that they are both displayed at the same vertical position, activate “Align Bass Note”.
- If you want the tensions to be displayed at the same vertical position as the root note (rather than a bit above the root note), activate “Tension Bottom”.
- If you want to scale a staff by using the Size setting on the Options tab of the Staff page in the Score Settings dialog and want the chords to be scaled accordingly, activate “Scale Chords”.
- If you want the chord symbols to be affected by the Display Transpose setting on the Staff page of the Score Settings dialog, activate “Use Display Transpose”.

Working with text

About this chapter

In this chapter you will learn:

- Which different types of text are available.
- How to enter and edit text.
- How to set font, size, and style.
- How to enter lyrics.

Adding and editing text symbols

This section describes the general procedure for adding and editing text symbols. There are several different types of text symbols, but the basic procedures are the same (except for block text symbols and page text symbols).

RELATED LINKS

Different types of text on page 1452
Block Text on page 1455
Page Text on page 1457

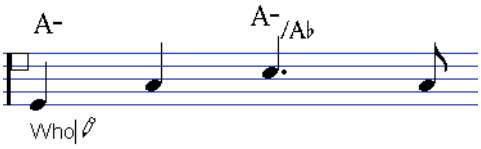
Inserting a text symbol

PROCEDURE

1. Make sure that the correct staff is active.
2. If you wish, select a font, size, and style for the text (or select a text attribute).
   You can also change these settings after you inserted the text.
3. In the Symbols Inspector, open a symbol tab.
   The different text symbols are found on the Other tab.
4. Right-click the text symbol on the tab to select the layer for which you want add text.
   Not all text symbols are available for all layers.

5. Click the text symbol and click in the score at the position where you want the text to appear.

   If you are adding lyrics, you should click above or below a note (lyrics are centered around each note and positioned vertically to where you clicked).



6. Enter the text in the text box that appears.

   You can use [Backspace] to delete letters, and move the cursor with the arrow keys.

7. When you are done, press [Return].

   The text appears. You can move, duplicate or delete it as with any symbol.

RELATED LINKS

Selecting font, size, and style for the text on page 1449
Lyrics on page 1453

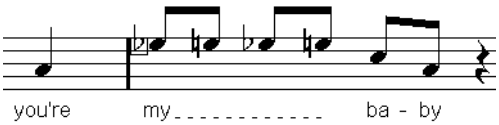
Importing Karaoke Lyrics as Text

If you activate the “Import Karaoke Lyrics as Text” option in the Preferences dialog (MIDI–MIDI File page), karaoke lyrics from MIDI files are converted to text on import. You can edit it in the same way as regular text.

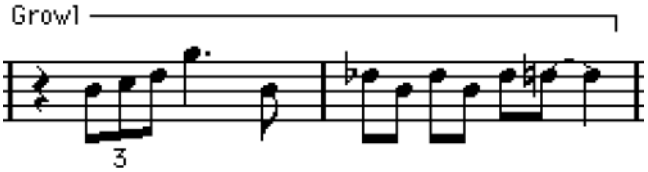
About the melisma lines

When you add a text symbol, you can find a handle at the right edge of the text. By dragging this handle to the right, you can extend a “melisma line” from the text. This has several uses:

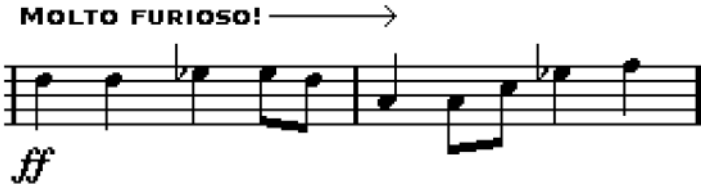
- If you are adding lyrics and want to indicate that a syllable should be sung over several notes:



- If the text is an advice about articulation or playing style, and you want it to apply to a certain musical phrase only:



- If the text is an advice about articulation or playing style, and you want it to apply from that point on in the score:



In the Score Settings dialog (Text tab), you can find two settings that determine the appearance of the melisma lines for text symbols:

- The Melisma Style pop-up menu is where you specify whether the line is solid or dotted.
- The Melisma End pop-up menu allows you to choose whether the end of the line is plain, has an arrow, or forms a “bracket” up or down.

Making space

Dragging staves is a way to edit distances within staves or between grand staves. Auto Layout makes the program “go through“ the score and makes adjustments to measure widths, staff distances, etc.

RELATED LINKS

Dragging staves on page 1490
Auto Layout on page 1494

Editing the text

If you made a mistake when typing or for some other reason want to change text, double-click on a text block with the Object Selection tool, edit the text and press [Return] to close it.

- It is also possible to replace all occurrences of a certain word in the score, without having to edit the texts manually.

RELATED LINKS

Find and replace on page 1461

Selecting font, size, and style for the text

PROCEDURE

1. Select the text that you want to make settings for.

   If nothing is selected, the settings you make are the “default settings”. The next time you insert text, these settings are used.

2. Open the Score Settings dialog and select the Text page.

3. Select a font from the Font pop-up menu.

   How many and which fonts appear depends on what typefaces you have installed on your computer.

   IMPORTANT

   For regular text you should avoid the “Steinberg” fonts. These are the fonts Nuendo uses for all scoring symbols, etc.

4. Select a text size from the Size pop-up menu (or enter one manually in the text field).
5. You can also add one or several font options using the checkboxes and pop-up menus.
6. Click Apply to apply the settings to the selected text.

   Note that you can select other text blocks while the dialog remains open – the dialog is updated to reflect the settings of the currently selected text.

7. When you are done, close the Score Settings dialog.

Special style options

Most of the options are common text style variations such as bold, italic, underline, etc. But there are also a few special style options:

Frame

Allows you to put the text in a rectangular (“Box”) or oval frame.

Melisma options

These determine the appearance of the “melisma line”.

Positioning

Allows you to select which side of the text block (left or right) is used for calculating its position. This has an effect in situations where that text block is moved automatically (as a result of an Auto Layout function, when you move bar lines manually, etc.). If, for example, the text block appears just in front of a note (to the left of it), it appears in a more sensible position after the adjustment, if the “Right” option is selected.

Alignment: Left/Center/Right

Allows you to specify the alignment of the text. These options are only valid for texts with more than one line.

RELATED LINKS

About the melisma lines on page 1448

Text attribute sets

A text attribute set can be seen as a “preset” containing all font, size, and style settings. By creating text attribute sets for the settings you use most often, you can save a lot of time.

Creating a text attribute set

PROCEDURE

1. Open the Score Settings dialog on the Project page and select the Font Settings subpage.
2. Open the Attribute Sets tab.
3. On the Font Set pop-up menu, select the “Empty” set.
4. Select a font, specify a size, and add style options using the checkboxes.
   The options are the same as when you make font settings on the Text page in the Score Settings dialog (see above).
5. Click in the text field of the Font Set pop-up menu and enter a name for the new text attribute set.
6. Click Store to save the new text attribute set.

Using text attribute sets

To apply the settings in the text attribute set to one or several text blocks, select them, select the set from the Font Set pop-up menu on the Text page in the Score Settings dialog and click Apply. You can also apply a text attribute set to a text block directly in the score by right-clicking it and selecting the set from the context menu.

- If you select a text attribute set on the Text page when no text is selected in the score, the settings are used the next time you insert some text.

NOTE

After you have selected a set for a text block, there is a “link” between the text and the attribute set. Any changes to the attribute set affects all texts that use it (see below). You can still edit any font settings manually (on the Project–Font Settings subpage) but then the “link” to the attribute set is removed.

Editing text attribute sets

If you edit the settings in a text attribute set, all texts using this particular set are affected. This is very practical, since it allows you to use the same number of “generic” sets for all your projects (for titles, comments, lyrics, etc.), and simply change the fonts, sizes, etc. for a different project if necessary. This also makes it easier to move projects between computers (which may not have the same fonts installed).

PROCEDURE

1. In the Score Settings dialog on the Project–Font Settings subpage, select the Attribute Sets tab.
2. From the Font Set pop-up menu, select the attribute set that you want to edit.
3. Change the settings as desired.
   This includes the name of the set.
4. Click Apply.

Different types of text

You can add various types of text to the different layers of the score. The selected layer specifies which type of text is available.

Regular text

This type of text is inserted by selecting Text in the Other tab. You can insert this type of text on all layers.

The text is tied to the bar and staff position. If you move the bar or the entire staff, it moves with it.

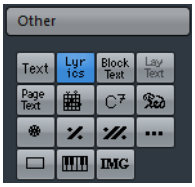
Pasting text

You can paste text (e.g. from another program) into a text symbol in the score. To do this, select the text symbol and right-click it. Then, select “Text From Clipboard” from the context menu. This option is also available on the Functions submenu of the Scores menu.

Similarly, you can copy selected text by using the “Text To Clipboard” option from the context menu.

Lyrics

This type of text is inserted by selecting Lyrics on the Other symbol tab. You can insert this type of text only on note layers.



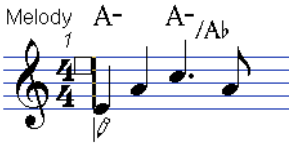
When you insert lyrics, you should click below or above the note the syllable belongs to. The text then appears horizontally centered around the note and vertically positioned to where you clicked. You can later move it up or down, as with any symbol.

Lyrics are tied to the note position. If you move the note, the text moves with it. The spacing between notes is also adjusted to make the lyrics fit.

Inserting lyrics for a number of notes

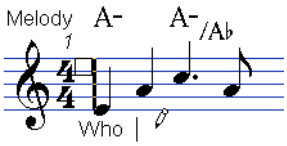
PROCEDURE

1. With lyrics selected, click below or above the first note with the Draw tool.



2. A text input field opens. Enter the text (the word or syllable) for that note.
3. Press the [Tab] key.

   The program moves on to the next note.



4. Input text for this note and press [Tab] again.
5. Proceed until the last note and then press [Return] or click outside the text box.

   When you insert lyrics this way, the positions of the notes are automatically adjusted so that no lyric “block” overlaps another. If this is not what you want, you can activate the “Don’t Sync Lyrics” option in the Score Settings dialog on the Project–Notation Style subpage (Lyrics category). If this is activated, the note positions are not affected, which may be preferable.

   When entering words with several syllables you normally separate the syllables with a dash (-). By default, the dash signs are automatically centered between the syllables

– if this is not what you want, activate the “Don’t Center Hyphens” option in the Score Settings dialog, on the Project–Notation Style subpage (Lyrics category).

Lyrics and measure widths

When you first enter lyrics, the result may look crammed, since the words take up more space than the notes (the lyrics are also selected just after entering the last word, which makes them look a bit odd when overlapping). To remedy this, use the auto layout function to automatically adjust the measure widths.

RELATED LINKS

Auto Layout on page 1494

Adding a second verse

To insert a second line of lyrics, proceed as follows:

PROCEDURE

1. Enter the new lyrics above or below the existing verse.
2. Select all the words that should be in the new verse.
3. Right-click the selected words to open the context menu.
4. Select the appropriate verse from the Move To Verse submenu (Verse 1–6).

   This assigns the selected lyrics to the selected verse.

   To indicate that the words belong to another verse, they are automatically displayed in another color. However, all verses are printed in black as usual.

   - To select all words in one verse only, press [Shift] and double-click on the first word in that verse.

     This selects all following words in the verse.

Inserting lyrics into voices

Each voice can have its own lyrics. If you have a vocal arrangement with several voices, you can add lyrics to them, one by one.

PROCEDURE

1. Make sure that the correct voice is selected (on the extended toolbar).
2. In the Symbols Inspector, open the Other tab and click on the Lyrics symbol.
3. Click on the first note in the selected voice.
4. Enter the lyrics for this voice, using the [Tab] key to move from note to note, as described above.

5. Start over, by activating the next voice, clicking on the first note in that voice and proceeding as with the first voice.
6. If needed, adjust the position of the lyrics for each voice (see below).

RELATED LINKS

Entering notes into voices on page 1364

Moving lyrics

If you want to move the lyrics up or down, for example to make room for a second verse, proceed as follows:

PROCEDURE

1. Hold down [Shift] and double-click on the first word in the lyrics.
   All lyric “blocks” are selected.
2. Drag one of the lyric blocks up or down.
   All selected lyric blocks are moved accordingly.

Adding lyrics from the clipboard

If you want to prepare your lyrics in another program, you can import them into Nuendo the following way:

PROCEDURE

1. Create the lyrics in another program.
   Separate words with space as usual, syllables within words with dash signs (-).
2. Copy the text.
3. In Nuendo, select the first note to which the lyrics will be added.
4. Open the Scores menu and select “Lyrics from Clipboard” from the Functions submenu.
   The lyrics are added, starting at the selected note.

Block Text

Block Text allows you to import text from a file on disk or from the clipboard. Proceed as follows:

PROCEDURE

1. Click the Block Text symbol on the Other tab to activate the Draw tool.
   You can insert block text on the project layer (for text that should appear on all pages, for example, the score title), on the layout layer (to print a title only for a particular track layout, for example, for a particular instrument), or on the note layer (this text only appears in the score for a particular part).

2. Click in the score where you want to insert the text.
   A regular file dialog appears.
3. Select a file (TXT or RTF) to import.
4. Click Open.
   The text in the file is inserted into the score.

Options for inserted Block Text

Right-clicking on inserted Block Text brings up a pop-up menu with the following options:

Settings

Brings up the RTF Settings dialog. You can also open this by double-clicking the Block Text.

Import Text

Imports text from a text file or RTF file. The imported text replaces any text currently inserted at the position of the Block Text.

Update Text

Reloads the text from the file.

Text From Clipboard

Pastes the text from the clipboard into the Block Text.

Text To Clipboard

Copies the Block Text to the clipboard.

Hide/Show

Hides the inserted block text. To make the text visible again, activate the Hide checkbox in the filter bar and select “Hide/Show” on the context menu.

Properties

Brings up the RTF Settings dialog.

The RTF Settings dialog

Selecting “Settings” from the context menu (or double-clicking the Block Text) brings up a dialog with settings for the Block Text. These are:

Font

Lets you select the font to use for the Block Text. If “No Change” is selected, the font in the original file (if applicable) is used.

Size

The text size, as a percentage.

Draw Frame

When this is activated, a frame is shown around the Block Text.

Word wrap

When this is activated, line breaks are used to fit the text in the Block Text symbol.

Replace mode

In this mode, the Block Text box is opaque, covering what's under it.

Trans mode

In this mode, the Block Text box is transparent.

Lay Text

The Lay Text symbol allows you to insert layout text for multiple staves. This is available only on the layout layer.

To hide or show the inserted text for different staves in the layout, deactivate or activate the "L" column for the corresponding tracks on the Layout page of the Score Settings dialog. The text appears in all staves for which you have activated the "L" column. This means that the text is tied to the bar and staff position. If you move the bar or the entire staff, the text moves with it.

To enter layout text, proceed as follows:

PROCEDURE

1. In the Project window, select the tracks for which you want to enter text.
2. Open the Score Editor.
3. On the Other tab of the Symbols Inspector, activate the Lay Text symbol and click at the position in the score where you want to insert the text.
4. Enter the text that you want to display for the Layout.

   As with regular text, you can copy and paste text from external sources to this symbol.

RELATED LINKS

Regular text on page 1452

Page Text

The page text symbols are found on the Other tab. If you insert page text on the project layer, it is part of the project layout and appears in all layouts.

The position of page text is not tied to a note, bar or staff position. In other words, it does not matter if you move other objects on the page, the page text stays where you inserted it. Typically, it is used for score titles, page numbers, copyright information and other text elements that you want displayed with all parts (on all pages if you like).

Entering page text

PROCEDURE

1. Open the Other tab of the Symbols Inspector.
2. Click the Page Text symbol and click in the score.

   It does not matter where you click – the positioning is specified in the Page Text dialog.
3. Enter the text that you want displayed in the field at the top of the dialog.

   You can use special characters to add “variables” such as page numbers – see below.
4. Adjust the positioning settings for the text.
5. Select a text attribute set for the text, or make manual settings for font, size, and style.
6. Click OK.

   The text is inserted. You can adjust the positioning manually by dragging the text block.

Text adjustment options

Show on all Pages

When this is activated, the text is shown on all pages. The “Except First” checkbox allows you to exclude the very first page.

Show on First Page

When this is selected, the text is only shown on the first page.

Line

This determines how the text is aligned. For example, if you place several texts on “Top/Left”, you can sort them by entering the desired number of lines.

Toggle Position

When the Left or Right position option is selected to the right, activating this checkbox makes the text alternate between left and right alignment on even/odd pages.

Position buttons

Determines where on the page you want the text, vertically (Top/Bottom) and horizontally (Left, Center, Right).

Inserting variables

When you enter the text, you can also insert special characters or “place holders” for different attributes. When the text is displayed, these characters are replaced by their actual values (e.g. page numbers). The following variables are available:

%p

The current page number.

%l (lower case L)

The long staff name.

%s

The short staff name.

%r

The name of the project.

For example, if you enter the text “%l, %r, Page %p”, these variables might be shown as “1st Violin, Quartet No.2, Page 12” in the score.

Using the Score Settings (Text page)

In the Score Settings dialog on the Text page, you can find a number of text-related settings. The symbol buttons correspond to the symbols found on the Other tab of the Symbols Inspector.

- On the Layer pop-up menu, select the layer that you want to use.

  The text symbols available for this layer are displayed to the left of the pop-up menu.

- You can use the text symbols in the same way as you would use symbols from the Inspector or a symbol palette.

  When you select a text symbol and move the mouse pointer over the score, the pointer changes to a pencil, and you can enter text at the position you click on.

RELATED LINKS

Symbol details on page 1430

The Notepad tab and the Selection tab

Below the text symbols and the Layer pop-up menu, you can find two tabs with large text entry fields.

- Use the Notepad tab to enter longer text passages. When you are happy with the text in terms of wording and length, select all or part of the text, and select a note in the score. Now, the Insert Lyrics button below the Notepad tab becomes available.

  When you click Insert Lyrics, the selected text is entered into the score, starting from the note you selected.

- When you select text in the score and open the Selection tab, the selected words are shown in the text field. You can now change the wording of the text, and use the text format options to the left to change the appearance of the selected text. When you are done, click Apply to apply your changes to the selected text in the score.

Text functions

In addition to the text symbols that you can add to the different layers, you have other text functions at your disposal that support you while working on the score. These are described in the following sections.

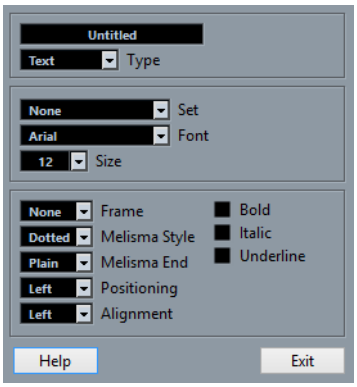
The Words tab

If you have certain words that you use a lot, you can save these as dedicated symbols on the Words tab. This saves time, since you do not have to type the same word over and over again.

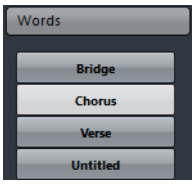
Storing a word

PROCEDURE

1. Open the Words symbol tab.
   This tab is hidden by default.
2. Double-click on an “empty” symbol.
   The Custom Text Editor dialog appears.



3. Type in the desired word(s) in the text field at the top of the dialog.
4. Specify the text type (regular text or lyrics) with the Type pop-up menu.
5. Make settings for font, size, and style.
   You can also use a text attribute set if you like.
6. Click Exit to close the dialog.
   The words that you entered appear in the selected symbol field on the Words tab.



Right-clicking one of the fields opens a context menu with a number of options:

- Select “Edit” to open the Custom Text Editor dialog.
- Select “New” to add a new empty symbol to the Words tab.
- Select “Remove” to delete any unwanted symbols from the Words tab.
- Select “Open As Palette” to open the Words symbol palette.

RELATED LINKS

Showing/Hiding Symbols Inspector tabs on page 1404

Inserting a word

You insert words from the Words tab as you would insert any regular symbol, by selecting the appropriate word and clicking in the score. However, you can edit the word after inserting it, just as with text inserted by typing.

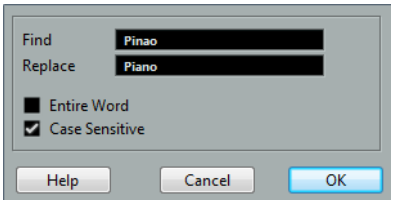
Find and replace

This function allows you to replace all occurrences of a certain word or group of words, with another word or group of words. The replacement is done once and for all, for all text symbol types, regardless of font, size, and style settings.

PROCEDURE

1. Open the Scores menu and select “Find and Replace” from the Functions submenu.

   The Find and Replace dialog opens.



2. In the Find value field, enter the words to replace.
3. If you want all instances of the words to be replaced, regardless of upper/lower case, deactivate the “Case Sensitive” option.
4. If you do not want to replace the words if they are a part of another word, activate the “Entire Word” option.

   For example, if you want to replace the word “string” but not the word “stringendo”, you should activate “Entire Word”.
5. In the “Replace” field, enter the words that are to be used as replacement.

6. Click OK.

   Now all occurrences of the “Find” words are replaced with the “Replace” words.

Staff names

You can make settings for staff names in several places:

- In the Score Settings dialog on the Layout page, you specify whether the staff names are shown at all and whether to use the names of the actual edited tracks in the score.

  In a multi-track layout, you can choose for which tracks the staff names are shown by clicking in the “N” column for each track.

- You specify a long and short staff name in the Score Settings dialog, on the Staff page (Main tab).

  These are used if you do not use the “From Tracks” option on the Layout page of the Score Settings dialog. The long name is displayed for the first system only, and the short name for the following systems. If you want a name at the top of the page only, leave the “Short” name field empty.

IMPORTANT

If the “Show Long Staff Names on new Pages” option is activated in the Score Settings dialog on the Project–Notation Style subpage (Staff Names category), the long name is displayed for the first system on every page.

Selecting a font for staff names

PROCEDURE

1. Open the Score Settings dialog on the Project page and select the Font Settings subpage.
2. Select the Project Text tab.
3. Use the “Font For” pop-up menu to select “Staff Names”.
4. Select font, size, and styles for the staff names (or use a text attribute set).
5. Click Apply and close the Score Settings dialog.

Additional staff name settings

- If you activate the “Show Staff Names to Left of Staff” option in the Score Settings dialog on the Project–Notation Style subpage (Staff Names category), the staff names are shown to the left of the staves, instead of above them.

- You can define separate subnames for the upper and the lower staff in a polyphonic or split system.
- You can fine-tune the vertical and horizontal position of staff names with some of the options on the Project–Spacings subpage of the Score Settings dialog.

RELATED LINKS

Staff names on page 1462

Bar Numbers

Bar Number settings can be made in several places as well.

General settings

PROCEDURE

1. Open the Score Settings dialog on the Project page and select the Notation Style subpage.
2. Scroll down the list to the “Bar Numbers” category.
3. Use the “Show every” setting to specify how often bar numbers are shown.

   The options are “First Bar” (bar numbers shown for the first bar on each staff), “Off” (no bar numbers shown) and any number. Click in the State column and use the mouse wheel to select the desired option.
4. If you like, activate the “Show Range with Multi-Rests” option.

   When this is activated, and you have a multi-rest, the bar number at the beginning of the multi-rest shows a range, indicating the length of the multi-rest.
5. If you want the bar numbers to be displayed below the bar lines, activate the “Below Bar Lines” option.
6. Click Apply and close the Score Settings dialog.

Font settings

As with many of the other fixed text elements, you can select a font, size, and style for bar numbers in the Score Settings dialog, on the Project–Font Settings subpage.

Spacing

On the Project–Spacings subpage of the Score Settings dialog, you can find four settings that relate to bar numbers:

First Bar Number – Horizontal Offset

Sets the horizontal distance between the bar number and the bar line for the first bar on each staff.

First Bar Number – Vertical Offset

Sets the vertical distance between the bar number and the bar line for the first bar on each staff.

Other Bar Numbers – Horizontal Offset

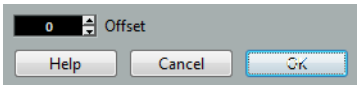
Sets the horizontal distance between the bar number and the bar line for all other bars.

Other Bar Numbers – Vertical Offset

Sets the vertical distance between the bar number and the bar line for all other bars.

Offsetting bar numbers

If you double-click on a bar number, a dialog appears, allowing you to skip a number of bars in the otherwise continuous bar numbering.



This is used for example when a section repeats. Say, you have a repeat of bar 7 and 8, and want the first bar after the repeat to have the number 11, not 9. To achieve this, you double-click on the “9” and insert an offset of “2”.

It is also useful if the score starts with an upbeat, and you want the first “real” bar to be numbered 1. In that case you would specify an offset of “-1” for the second bar, and make sure that the bar number for the upbeat bar is hidden.

- Bar number offsets belong to the Project layer and are shown for all tracks and layouts.

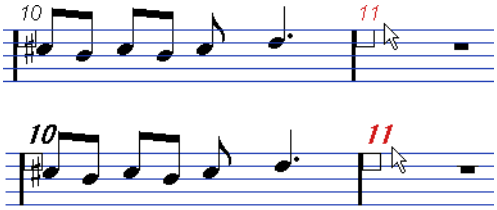
Settings for other fixed text elements

You can make settings for virtually all text and numbers that appear in the score.

PROCEDURE

1. Open the Score Settings dialog on the Project page and select the Font Settings subpage.
2. Select the Project Text tab.
3. Use the “Font For” pop-up menu to select a text type to make settings for.
4. Use the options in the dialog to change the settings.
5. Click Apply to apply the settings to all elements of the selected type.

   To close the dialog, click the close button at the top right of the dialog window.



Bar Numbers before and after changing their font settings.

You can also define text attribute sets on the Font Settings subpage, as a means to quickly change text.

Note that you can select a defined attribute set from the context menu opened when right-clicking on a text element.

RELATED LINKS

Text attribute sets on page 1451

Working with layouts

About this chapter

In this chapter you will learn:

- What layouts are and what they contain.
- How to create layouts.
- How to use layouts for opening combinations of tracks.
- How to apply, load, save and delete layouts.
- How to import and export layouts.
- An example of how layouts can be used.

Background: Layouts

Layouts can be viewed as “presets” containing settings for the layout layer: staff spacing, bar lines, layout symbols, etc.

When to use layouts

- You need to format the score differently when you print the entire score and when you extract parts for single instruments (or groups of instruments). Layouts allow you to keep different sets of “looks” for the same track or set of tracks. You might for example have one layout for each single instrument and one for the entire score.
- By selecting another layout on the Layout page of the Score Settings dialog, you can switch to another combination of tracks without having to leave the Score Editor.

What makes up a layout?

A layout contains the following items and properties:

- The inserted Layout symbols.

- All settings on the Layout page of the Score Settings dialog.
- The vertical spacing of the staves.
- Bar line spacing.
- Broken bar lines.

NOTE

Note that Project symbols, bar line types and bar number offsets are part of the Project layer, and appear in all layouts.

RELATED LINKS

The available symbols on page 1406

How layouts are stored

Layouts are created automatically when you edit a single track or a combination of tracks. They are an integral part of the specific track combination, which means you do not have to save them separately.

Creating a layout

Layouts are created automatically when you open a new combination of tracks for editing.

Each track may have been edited before, individually or together with other tracks, it does not matter. What matters is that you open precisely these tracks. For example, to create a layout for a string quartet, select parts on the corresponding tracks and press [Ctrl]/[Command]-[R].

IMPORTANT

The order of the tracks does not matter – you can reorder them in the Project window without removing the layout. However, the spacing of the staves in the layout is related to the order of the tracks.

Opening a layout

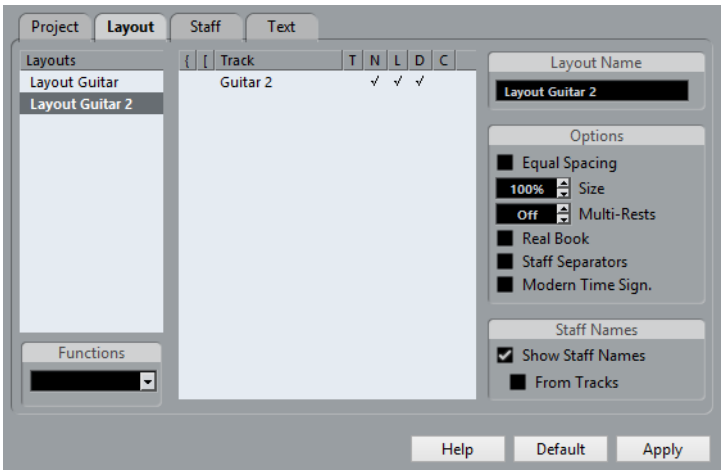
The “Open Layout” command on the Scores menu opens a dialog listing all available layouts for the Project.

- Select the desired layout in the list and click OK to open the tracks contained in the layout in the Score Editor.

  This is a quick way for opening several tracks in the Score Editor directly from the Project window.

Layout operations

The Score Settings dialog contains a Layout page, where you can make settings for the different layouts. To the left of the dialog, all existing layouts in the project are listed (this is the same list as in the Open Layout dialog, see above). The layout currently used is highlighted in the list.



Opening the tracks in a layout

To select another combination of tracks for editing, select the corresponding layout in the list.

- You can keep the dialog open while you are editing, and use this function for selecting which tracks to edit.

Importing layout symbols

By selecting another layout and selecting “Get Form” from the Functions pop-up menu below the list, you import all Layout symbols (inserted from the Layout section in the Symbols Inspector) from the selected layout into the current layout.

Managing layouts

- To rename a layout, select it in the list and enter the desired name in the Name field to the right in the dialog.

  Initially, a layout gets the name of one of the edited tracks – it may be a good idea to give each layout a more informative name.

- To remove a layout you no longer need, select it in the list and select “Remove” on the Functions pop-up menu.

- To remove all layouts for which there no longer are track combinations, select “Clean Up” on the Functions pop-up menu.

Importing and exporting layouts

By selecting a layout and selecting “Export” or “Import” from the Functions pop-up menu below the list, you can export or import a Layout. Note that all Staff settings are taken into account, when exporting or importing a layout.

Working with Display Transpose

You can specify for each staff in a layout whether it should use Display Transpose. In the Score Settings dialog on the Layout page, click in the D column to activate or deactivate the option. Note that this setting affects this layout only.

Using layouts – an example

The following text outlines the basic steps for extracting a musical part from a full score.

PROCEDURE

1. Prepare the entire score, including all formatting.

   This might include inserting project layer block text for the score title, setting the bar line type, etc.

2. Open the Score Settings dialog on the Layout page and enter the desired name in the Name field (for example “Full Score”).
3. Close the Score Editor.
4. Open a single track, for example a woodwind part.

   The Project layer settings automatically appear in the new single track layout.

5. Prepare a layout for the woodwind part.

   You might for example move bar lines, add endings, activate multiple rests, etc.

   You can also import all layout symbols from the “Full Score” layout, by opening the Score Settings dialog on the Layout page, selecting the “Full Score” layout in the list to the left, and selecting “Get Form” from the Functions pop-up menu.

   IMPORTANT

   Be careful not to change any of the properties which are not part of the layout. This modifies the “Full Score”, too.

6. Enter the desired name for the new layout in the Name field on the Layout page of the Score Settings dialog and click “Apply”.

RELATED LINKS

Importing layout symbols on page 1468

Marker Track to Form

If you have created markers in the Project window which denote the start of each new “section” in your music (verse, bridge, chorus, etc.), you can automatically transfer these markers into the current layout.

PROCEDURE

1. Open the Scores menu, open the Advanced Layout submenu and select “Marker Track to Form”.

   Now, rehearsal marks and double bar lines are inserted in the score, at the position of each marker.

2. If you want the names of the markers shown as well, open the Advanced Layout submenu again and select “Display Markers”.

   NOTE

   Only the markers of the active marker track are displayed.

Working with MusicXML

Introduction

MusicXML is a music notation format developed by Recordare LLC in 2000 based primarily on two academic music formats. It allows the representation of scores in the current symbolic representation of western music notation, used since the 17th century. With Nuendo you can now import and export MusicXML files created with version 1.1. This makes it possible to share and exchange sheet music with people who are using score writing programs such as Finale and Sibelius.

NOTE

As MusicXML is supported to various degrees by different programs, you always have to do manual adjustments.

What is MusicXML used for?

The MusicXML file format can be used for the following purposes:

- Representation and printing of sheet music
- Exchange of sheet music between various score writing programs
- Electronic distribution of musical scores
- Storage and archiving of scores in an electronic format

Notational representation vs. musical performance

MusicXML is a music notation file format, that means it deals especially with the layout of music notation and the correct graphical representation, i.e. how a piece of music should look.

However, MusicXML music data also contains elements that define how a piece of music should sound. For example, these are used when creating a MIDI file from MusicXML. This means that MusicXML has things in common with MIDI.

MIDI is a music interchange format for performance applications like Nuendo or other sequencers. The MIDI file format is designed for playback, i.e. the main focus of the MIDI file format lies in the performance, not in the notation.

Is MusicXML better than MIDI?

The following sections inform you about the advantages of MusicXML and MIDI regarding note representation and sound.

Advantages of MusicXML

MIDI tracks hold MIDI notes and other MIDI data. A MIDI note in Nuendo is only defined by its position, length, pitch and velocity. This is not enough to decide how the note will be displayed in a score. For a correct representation, Nuendo also needs the following information:

- Stem direction, beaming.
- Expression marks (staccato, accent, ties and slurs).
- Information about the instrument in the score.
- Key and basic rhythm of the piece.
- Grouping of notes, etc.

MusicXML can save a great part of this information. However, you have to adjust the scores with the tools available in the Score Editor.

Advantages of MIDI

Although MusicXML has obvious advantages in the representation of musical scores, there are also restrictions in sound. This is due to the fact that MusicXML as a music notation format has a graphical background and is designed for exchanging representation, not sound.

When playing back MusicXML files in Nuendo, the following parameters, among others, are not considered:

- On and Off velocities
- Dynamics
- Controller data
- SysEx
- Standard MIDI file meta events
- Audio
- All Nuendo-specific data like automation, MIDI effects, Input Transformer, etc.

Importing and exporting MusicXML files

Nuendo can import and export MusicXML files, which makes it possible to transfer musical scores to and from applications that support this file format. However, there are some restrictions concerning the parameters supported by Nuendo.

Importing and exporting Notes

Parameter	Export	Import
Pitch	Yes	Yes
Length	Yes	Yes
Staves	Yes	Up to two per staff
Voices	Yes	Up to four per staff
Accidentals	Yes	Yes
Ties	Yes	No
Dots	Yes	No
Stem	Yes	Yes
Beams	Yes	No
Grace Notes	Yes	Yes
Rests	Yes	Yes

Importing and exporting Layouts

Parameter	Export	Import
Page Size	Yes	No
Page margins	Yes	Yes
Page scaling	Yes	Yes
Page breaks	Yes	No
System breaks	Yes	Yes
Distance between staves and systems	Yes	Yes
Left/right Inset	Yes	No
Distance between measures	Yes	No
Hidden staves	Yes	Yes
x and y positions of symbols	Yes	Yes

Importing and exporting Symbols

Parameter	Export	Import
Keys	Yes	Yes
Clefs	Yes	Yes
Time Signature	Yes	Yes
Dynamics	Yes	Yes
Ornaments	Yes / incomplete	Yes / incomplete
Articulations	Yes / incomplete	Yes / incomplete
Technicals	Yes / incomplete	Yes / incomplete
Lyrics	Yes	Yes
Chord Symbols	Yes	Yes
Damper Pedal	Yes	Yes
Dynamics	Yes	Yes
Rehearsals	Yes	Yes
Text	Yes	Yes
Layout Text	Yes	N.A.
Project Text	Yes	“Credits”
Dashes	Yes	Yes
Endings	Yes	Yes
Octave Shift	Yes	Yes
Bar line types	Yes	Yes
Slurs	Yes	Yes
Hammer-on/pull-off	No	No

Importing and exporting Formats

Parameter	Export	Import
Display Transpose	Yes	Yes
Drum notation	Yes	Yes
Short / long staff names	Yes	Yes
Program changes	Yes	N.A.
Music font	Yes (if Jazz font)	Yes
Tablature (including String tunings)	Yes	Yes

Importing MusicXML files

PROCEDURE

1. Open the File menu and open the Import submenu.
2. On the submenu, select “MusicXML…”.
3. In the file dialog that opens, locate and select the MusicXML file and click “Open”.
4. Another file dialog opens in which you can select the project folder for the new project.

   Select an existing project folder or create a new one by clicking “Create” and entering a name in the dialog.
5. A new project is created with the name of the MusicXML file.

Exporting MusicXML files

PROCEDURE

1. Set up the score the way you want it in the Score Editor of Nuendo.
2. Open the File menu and open the Export submenu.
3. On the submenu, select “MusicXML…”.

   Note that this option is only available when the Score Editor is open.
4. A file dialog opens in which you can choose an existing empty folder or create a new folder for saving the MusicXML file (with the extension “.xml”).

Designing your score: additional techniques

About this chapter

In this chapter you will learn:

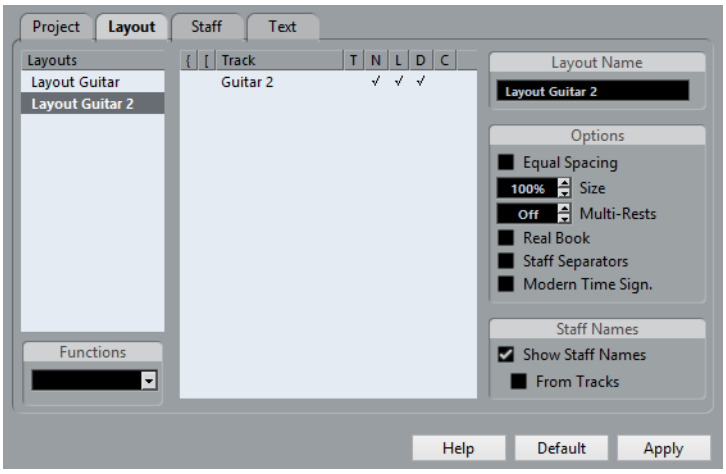
- How to change the staff size.
- How to create multi-rests.
- How to add and edit bar lines.
- How to create upbeats.
- How to set measure spacing and the number of bars across the page.
- How to control staff and grand staff spacing.
- How to use the Auto Layout dialog.
- How to use the Reset Layout function.
- How to break bar lines.

IMPORTANT

Before you start designing the score page layout, you should open the Page Setup dialog on the File menu, and make settings for paper size, print scale and margins!

Layout settings

The Layout page of the Score Settings dialog contains a number of settings that affect the display of the current layout.



The track list

The track list lists the tracks included in the layout and allows you to make the following settings:

Brackets

These two columns allow you to add braces or brackets, encompassing any number of staves in the layout.

T

This is relevant if the “Modern Time Sign.” option is activated to the right. In that case, you use this column to specify for which tracks the time signature is shown – see below.

N

This option lets you specify for each staff in a layout whether the staff name is shown.

L

If this is activated, any layout symbols are shown; otherwise they are hidden. For example, this allows you to have rehearsal marks shown for the top staff only in a multi-staff layout.

D

This option lets you specify for each staff in a layout whether it should use Display Transpose.

C

This option lets you specify which staff should show the chord track symbols. The chord track symbols can only be shown on one staff.

RELATED LINKS

Adding brackets and braces on page 1493
Displaying the Chord Symbols from the Chord Track on page 1493

Equal Spacing

Activate this option when you want a note to take up space according to its note value. When Equal Spacing is activated, two sixteenth notes take up as much space as one eighth note, for example.

Size

Changes the size of all staves.

RELATED LINKS

Staff size on page 1479

Multi-Rests

Whenever more than one-bar rests occur, the program can replace these with a multi-rest symbol. This parameter allows you to set how many empty bars are “allowed” before Nuendo collects them into a multi-rest. “Off” means “never”.

RELATED LINKS

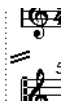
Multiple rests on page 1483

Real Book

When this option is activated, clef symbols are not set out at the beginning of each staff, only on the first staff on each page.

Staff Separators

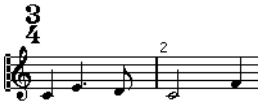
When this option is activated, separator symbols are inserted at the beginning of each grand staff.



A staff separator between two systems

Modern Time Signature

When this is activated, time signatures are shown above the staves rather than in them. You can set the size of the modern time signature in the Time Sign section on the Project–Notation Style subpage of the Score Settings dialog. When modern time signature is selected, you use the “T” column in the track list in the Layout page to specify for which tracks time signatures are displayed.



- If you prefer to display the score in a more modern way, check out the other options on the Notation Style subpage.

  For descriptions of the options use the Help button in the dialog.

Staff size

You can set the staff size as a percentage value of the normal size.

For one staff

To set the staff size for one staff, proceed as follows:

PROCEDURE

1. Make sure that the staff you want to edit is active.
2. Open the Score Settings dialog on the Staff page and select the Options tab.
3. Adjust the Size parameter in the System Sizes section.

   The values range from 25% up to 250% of the normal size.
4. Click Apply.

For all tracks in a layout

To set the staff size for all tracks in a layout, proceed as follows:

PROCEDURE

1. Open the Score Settings and select the Layout page.
2. Change the Size parameter.

   The values range from 25% up to 250% of the normal size.
3. Click Apply.

RESULT

All staves now get the desired size. Staves that have individual size settings (see above) still are proportionally smaller/larger.

This setting is part of the layout and can be used when printing a full score slightly smaller than the parts for each instrument, for example.

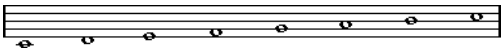
Hiding/showing objects

Any object on a page can be hidden, including notes, rests, symbols, clefs, bar lines, even entire staves.

This can be useful in the following situations:

Printing scales

If you want to create scale examples, enter the notes and hide time signatures, bar lines and other unwanted objects.



A scale created with hidden bar lines, time signatures, etc.

Graphic notation

By hiding bar lines, you can produce graphic notation.

Hiding notes meant for playback only

If you have recorded your music, you may have added glissandos, falls, etc. that sound fine but result in a lot of unnecessary notes. You probably want to hide those notes and insert the suitable symbols instead.

Hiding

To hide items, proceed as follows:

PROCEDURE

1. Select all the items you want to hide.
2. Select “Hide/Show” from the Score menu or click on the “H” (Hide) button on the extended toolbar.

Notes can also be hidden by selecting them, clicking the “i” button on the extended toolbar and ticking the Hide Note checkbox in the Set Note Info dialog.

IMPORTANT

If the Hide option in the filter bar is activated, hidden objects are shown in gray so that they are still visible and you can select them.

RELATED LINKS

Other note details on page 1380

Hiding in the current layout only

If you want the hiding to be “local” to the current layout, hold down [Ctrl]/[Command] when selecting “Hide/Show” as described above.

IMPORTANT

This is not possible when hiding notes, only other symbols.

NOTE

You can also move hidden objects to the layout by right-clicking the “Hide” marker and selecting “Move to Layout”.

Viewing hidden objects

The filter bar (shown by clicking the “Set up Window Layout” button on the toolbar and activating the Filters option) contains two options related to hidden objects:

- If you activate the “Hidden Notes” option, all hidden notes in the score are shown. Deactivating “Hidden Notes” hides the notes again.
- If you activate the “Hide” option, all hidden objects (except notes) are indicated by a “Hide” text marker.

Showing one object

PROCEDURE

1. Make sure that “Hide” is activated on the filter bar.
2. Click on the “Hide” text marker below the object you want to display again.
   The text is selected.

3. Press [Backspace] or [Delete].

   The object appears. Undo is available if you change your mind.

Showing all objects

If you select “Hide/Show” from the Scores menu again, all hidden objects are displayed.

- You can also use the Reset Layout function to permanently display hidden notes and objects.

RELATED LINKS

Reset Layout on page 1497

Showing a hidden note

While all hidden notes can be made visible by ticking the Hidden Notes checkbox on the filter bar, you may want to make some of them “permanently” visible again:

PROCEDURE

1. Activate the Hidden Notes checkbox on the filter bar.
2. Select the notes that you want to “un-hide”.

   In the Preferences dialog (Scores–Colors for Additional Meanings) you can set the color for hidden notes.
3. Double-click one of the notes.
4. Deactivate the Hide Note option in the Set Note Info dialog and click Apply.

Coloring notes

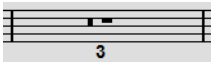
You can use the color pop-up menu on the toolbar to colorize selected notes, e.g. for educational purposes.

RELATED LINKS

Coloring notes on page 1382

Multiple rests

Multiple consecutive rests can be automatically displayed as multi-rests.



A multi-rest over three bars

PROCEDURE

1. Open the Score Settings and select the Layout page.
2. Set the Multi-Rests option to the number of empty bars that are “allowed” before Nuendo displays them as a multi-rest.

   For example, a value of 2 means that three or more consecutive empty bars are displayed as a multi-rest. If you set this to “Off”, multi-rests are not used.
3. Click Apply and close the dialog.

RESULT

The multi-rests now appear in the score.

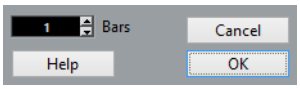
Splitting multi-rests

To divide one long multiple rest into several shorter ones, proceed as follows:

PROCEDURE

1. Double-click on the multi-rest symbol.

   The Split Multi-Rest dialog appears:

2. In the dialog, enter the bar number where you want the first split.
3. Click OK.

   If you need more splits, double-click on any multi-rest symbol and proceed as above.

   IMPORTANT

   The program automatically splits multi-rests at time signature changes, double bar lines, repeat signs and rehearsal marks.

Multi-rest appearance

The Project page in the Score Settings dialog contains several subpages, on which you can make settings for multi-rests:

- The subpage “Notation Style” contains the following settings concerning multi-rests:

Multi-Rests – Church Style

When this is activated, multi-rests are shown in “church style” (vertical bars), rather than with the regular, horizontal symbols.

Multi-Rests – Numbers above Symbol

When this is activated, the numbers are shown above the multi-rest symbol, instead of below it.

Multi-Rests – Snap Rests moved with the Layout tool

When this is activated, rests automatically snap to “intelligent” positions in the score (i. e. positions used in regular notation) when moved with the layout tool. If this is deactivated, rests can be positioned freely.

Bar numbers – Show Range with Multi-Rests

When this is activated, and bar numbers are displayed, the bar numbers of a multi-rest are shown as a range.

- On the Spacings subpage of the dialog, you can adjust the height and width of multi-rest symbols.
- On the Font Settings subpage, you can select a font for the multi-rest numbers (select “Multi-Rests” in the “Font For” pop-up menu and make the desired settings).

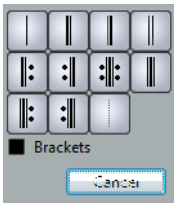
Editing existing bar lines

For each bar line, you can choose whether you want a regular, single bar line, a double bar line, a repeat sign, etc.:

PROCEDURE

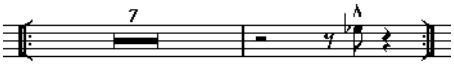
1. Double-click on the bar line for which you want to edit the settings.

   A dialog appears with a number of bar line types.



2. If you want the bar line to be shown with “brackets”, activate the Brackets checkbox.

   This is only relevant for repeat signs.



3. Click on the desired bar line type.

   The dialog closes and the bar line type is changed.

4. If you do not want to display bar lines at the beginning of the parts, open the Score Settings dialog on the Project–Notation Style subpage (Bar Lines category) and activate the “Hide First Bar line in Parts” option.

NOTE

The bar line types are part of the Project layer – any changes you make are reflected in all layouts.

Creating upbeats

The following methods describe how you can create upbeats in the Score.

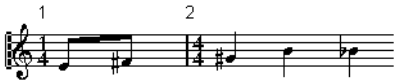
By using the Pickup Bar feature

With this method, the upbeat actually contains exactly the number of beats displayed. That is, if you have an upbeat of one beat, your project starts with one bar in 1/4 time.

PROCEDURE

1. Change the time signature of the first bar to the length of the upbeat.
2. Insert a time signature of the correct kind (the time signature used throughout the project) in the second bar.

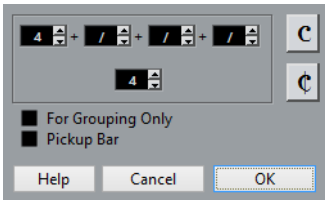
   To insert a time signature, select it in the “Time Signature” section in the Symbols Inspector and click in the Score with the Draw tool.
3. Enter the notes in the upbeat into the first bar.



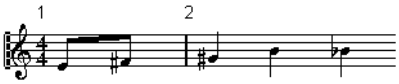
The first bar before making any adjustments

4. Double-click the time signature for the upbeat bar.

   The Edit Time Signature dialog appears.
5. Activate the “Pickup Bar” option and click OK.



Now, the time signature of the first bar takes on the look of the second bar’s signature, while the time signature in the second bar is hidden.



6. If you use bar numbers, double-click on the first bar number and enter an offset of -1.
7. Adjust the display of bar numbers and hide the “0” in the first measure.

By hiding rests

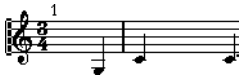
With this method, the first bar actually gets the same time signature as the following bars – it only looks like an upbeat bar:

PROCEDURE

1. Enter the notes in the upbeat into the first bar.

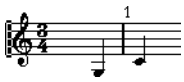
The first bar before making any adjustments

2. Hide the rests that precede the notes.
3. Drag the bar line between measure one and two to adjust the width of the bar.



After hiding the rest and dragging the bar line

4. If you like, move the notes in the upbeat measure, using the Layout tool.
5. If you use bar numbers, adjust them as described in the previous example.



The final upbeat

Setting the number of bars across the page

You can specify how many bars you want to display across the page.

Automatically

- When you open a new combination of tracks for editing, the number of bars across the page is determined by the “Default Number of Bars per Staff” setting in the Preferences dialog (Scores–Editing page).
- In the Auto Layout dialog, you can set the maximum number of bars across the staff.

RELATED LINKS

Auto Layout on page 1494

Manually

In Page Mode, you have full control over the number of bars appearing across the page, by using the Number of Bars dialog or the tools.

NOTE

If you want to use the “Max. number of Bars” option in the Auto Layout dialog, you should do this before you adjust the number of bars manually.

RELATED LINKS

Auto Layout on page 1494

Using the Number of Bars dialog

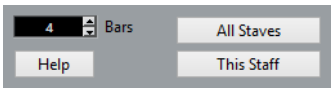
PROCEDURE

1. Make a staff active in the system where you want to make changes.

   This means that if everything looks fine until for example the fifth system, activate one of the staves in this system.

2. Open the Scores menu and select “Number Of Bars” from the Advanced Layout submenu.

   The Number of Bars dialog opens.

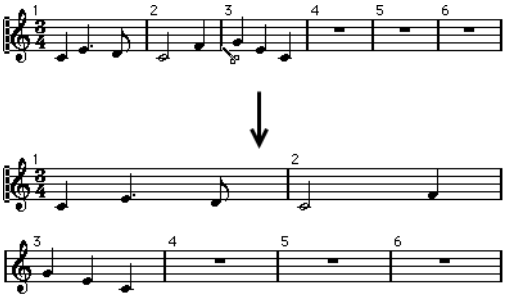


3. Set the desired number of bars across the page.
   - To change the number of bars for the active staff only, click “This Staff”.
   - To change the number of bars for the active staff and all following staves, click “All Staves”.

     In other words, to set all systems on all pages to the same number of bars, make the very first staff active and use the All Staves option.

Using the tools

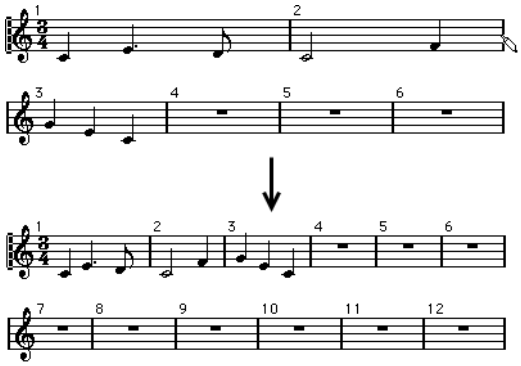
- To make a bar “fall down” on a new staff, use the Split tool to click on its bar line.



Before and after moving the third bar one staff down

- To bring the bar back up to the previous staff, use the Glue tool to click on the last bar line on the upper of the two staves.

  This in fact moves all measures in the lower staff to the upper staff.



Moving bar lines

The following operations can be made using the regular Object Selection tool or the Layout tool.

Moving a bar line

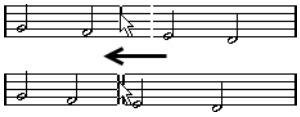
If you drag a bar line to the left or right, the surrounding bars are adjusted proportionally.

Moving bar lines on all staves

If you hold down [Alt]/[Option] when dragging a bar line, all bar lines below the one you drag are moved accordingly.

Moving a single bar line separately

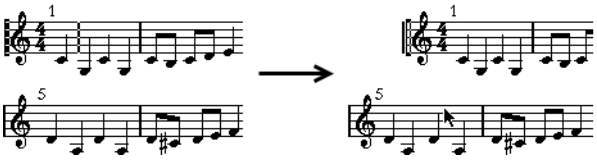
If you hold down [Ctrl]/[Command] while dragging a bar line, the widths of the surrounding bars are not affected.



Making an indent on one line

- To create an indent, simply drag the first or last bar line on a staff.

  The sizes of all measures are adjusted proportionally.



Before and after dragging the first bar line on the first staff

Making indents on several lines

If you hold down [Alt]/[Option] and drag the first or last bar line in a system, all following systems get the same indent. If you want all lines on all pages to be modified in the same way, hold down [Alt]/[Option] and drag the appropriate bar line on the first system of the score.

The last bar line in the score

Nuendo attempts to move the last bar line and space the bars on the last line in a sensible way. But you can change this manually by dragging the last bar line, if you like. To change the type of the last bar line, double-click it and select the desired type.

Resetting bar spacing

To reset the bar spacing to standard values for several lines, proceed as follows:

PROCEDURE

1. Locate the first line for which you want to reset the bar spacing, and make one staff in that system active.
2. Select “Number of Bars” from the Advanced Layout submenu on the Scores menu.
3. Specify the number of bars that you already have on the line.
4. Click on “This Staff”.

   Clicking “All Staves” resets the lines of all staves in the score.
5. Close the dialog.

   The bar spacing is reset for the currently selected staff and all following staves.

RELATED LINKS

Using the Number of Bars dialog on page 1487

Dragging staves

For the following operations, you can use the Object Selection tool or the Layout tool.

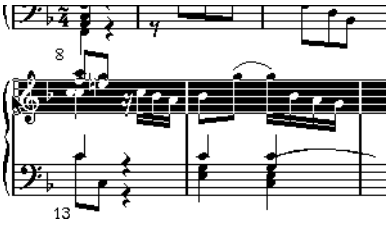
NOTE

Dragging staves can only be done in Page Mode.

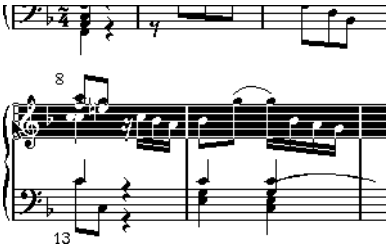
Adding space between two grand staves

PROCEDURE

1. Locate the first staff in the lower of the two systems that you want to spread apart.
2. Click just to the left of the first bar line and keep the mouse button pressed.
   The entire staff is selected.
3. Drag downwards until you have reached the desired distance between the staves and release the mouse button.



Before…



…and after dragging the upper system

Setting the same distance between all grand staves

PROCEDURE

1. Hold down [Alt]/[Option] and drag the first staff of the second system, until you have reached the desired distance between this and the first system.
2. Release the mouse button.

   The distances between all the systems are adjusted accordingly.

   IMPORTANT

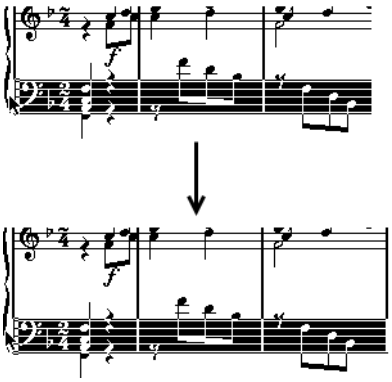
   This operation affects the system you drag and all following systems.

Setting the distance between staves within a grand staff

PROCEDURE

1. Locate the lower staff in the grand staff that you want to spread apart.
2. Click just to the left of its first bar line and keep the mouse button pressed.

   The entire staff gets selected.
3. Drag downwards or upwards and release the mouse button.



Dragging apart the staves in a piano system.

The new distance is set for the two staves.

Setting the same distance between staves in several systems

PROCEDURE

1. Hold down [Alt]/[Option] and drag the desired staff as described above.
2. Release the mouse button.

   The corresponding staves in all following systems are moved accordingly.

Moving one staff only

You may want to move one staff without affecting any other staff in any way:

PROCEDURE

1. Hold down [Ctrl]/[Command].
2. Drag any staff as described above.

Moving staves between pages

By using the “Move to Next/Previous Page” commands on the Staff context menu, you can quickly edit the page breaks.

Moving staves to the next page

PROCEDURE

1. Locate and activate the staff you want to move to the top of the next page.

   This can be any staff except the first staff on the page.
2. Right-click on the blue rectangle to the left of the staff, and select “Move to Next Page” from the context menu.

   The active staff (and any following staves on the page) are moved to the next page.

Moving staves to the previous page

PROCEDURE

1. Make the staff at the top of the page the active staff.

   If any other staff is active, the “Move to Previous Page” option cannot be used. Also, the function does not work for the first staff on the first page.
2. Right-click on the blue rectangle to the left of the staff, and select “Move to Previous Page” from the context menu.

   The active staff, and as many of the following staves as there are room for, are moved to the previous page. If the previous page is already “full”, nothing happens.

Adding brackets and braces

Brackets and braces are added on the Layout page of the Score Settings dialog. The settings you make are specific for the current layout, i.e. you can have different brackets or braces set up for different track configurations.

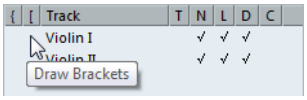
PROCEDURE

1. Open the Score Settings and select the Layout page.

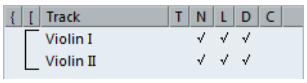
   In the track list, you can find columns for braces ({) and brackets ([ ).

2. Click in one of the columns and drag downwards in the list to encompass the desired staves.

   The column indicates graphically which staves are encompassed by the brace or bracket.

   Click at the first staff for which you want a bracket or brace…

   …and drag downwards in the list to enclose the desired staves.

3. Close the dialog.

   The score is displayed with brackets or braces according to the settings you made.

   - You can edit brackets and braces in the dialog by dragging the ends of the indicator in the list.
   - To remove a bracket or brace, click on its indicator in the list.

   You can automatically get broken bar lines based on the brackets you have added.

   If the “Show Braces in Edit Mode” option is activated in the Preferences dialog (Scores–Editing page), brackets and braces are shown in Edit Mode as well.

RELATED LINKS

Breaking bar lines on page 1498

Displaying the Chord Symbols from the Chord Track

You can display the chord symbols from the chord track. Chord symbols can be viewed, edited, and printed out in Page Mode.

PROCEDURE

1. To show the Chord Track symbols, open the Scores menu, and from the Advanced Layout submenu select “Show Chord Track”.

   On the Layout page of the Score Settings dialog you can specify which staff should display the chord track.

2. To edit a chord symbol, double-click it.

NOTE

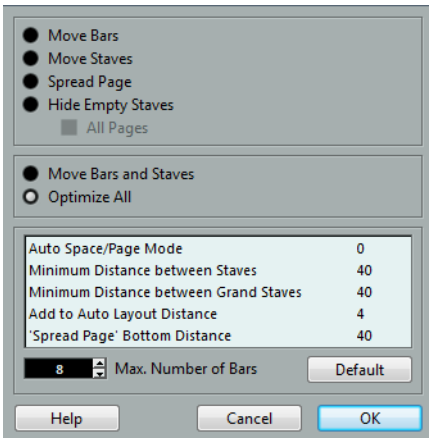
Moving chord symbols in the staff only affects the display. The position of the chords on the chord track remains unaffected.

RELATED LINKS

Layout settings on page 1477
Chord Functions (NEK only) on page 890

Auto Layout

This item on the Scores menu brings up a dialog with several options. Activating one of these makes the program “go through” the score and make adjustments to measure widths, staff distances, etc. Exactly which parts and properties of the score are affected depends on which option you activate/deactivate.



IMPORTANT

The automatic layout adjustments are done just as if you yourself had made them manually. This means that if there is something you do not like, you can always change it manually, as described above.

NOTE

You can also open the Auto Layout dialog by clicking the Auto Layout button on the extended toolbar.

Move Bars

This option looks at the currently active grand staff, and attempts to adjust the measure widths, so that all notes and symbols get as much room as possible. The number of bars on the staff is not affected.

- You can perform this function for several staves in one go, by dragging a selection rectangle over their left edges, and then selecting Move Bars.

Move Staves

This changes the measure width (as with Move Bars) but also the vertical staff distance, of the active staff and all following staves.

Spread Page

This corrects the vertical layout of the staves on the current page, so that they “fit onto the page”. In other words, this removes white space at the bottom of the page.

Hide Empty Staves

This hides all empty staves, from the active staff to the end of the score. Note that polyphonic/split staves are in this case treated as one entity, if the clef in the upper system differs from that in the lower system. That is, a piano staff is considered “empty” only if there are no notes on either staff.

- If you have activated the “Hidden” option on the filter bar, hidden staves are indicated by a marker with the text “Hide:Name” (where “Name” is the staff name).

  To display hidden staves, delete their “Hide” markers.

- If you activate the “Auto Layout: Don’t hide first staff” option in the Preferences dialog (Scores–Editing page), staves in the very first grand staff are not hidden, even if they are empty.

  This is useful for example if you are creating an orchestra score, and want to show the complete “layout” of the orchestra on the first page of the score, without hiding anything.

All Pages

Activate this if you want to apply the options above to all pages. Please note that this setting is applied to the active staff and onwards. If you want all pages in the score to be affected, you have to make the very first staff (the first staff on the first page) the active staff.

Move Bars and Staves

This is a combination of “Move Bars”, “Move Staves”, and “All Pages”, plus automatic calculation of the number of bars across the page – the function tries to optimize the number of bars across the page for each staff (with the maximum number of bars as set in the dialog).

Optimize All

All of the above in one fell swoop. This procedure might take some time but usually yields great results.

Other functions

In the lower part of the dialog, the following options are available:

Auto Space/Page Mode

The higher the value, the more space is allowed for each element in the score (and thus, the fewer the bars across the page).

Minimum Distance between Staves

When you use an Auto Layout function that moves staves (changes the vertical staff distance), this setting determines the minimum distance between the staves.

Minimum Distance between Grand Staves

This sets the minimum distance between Grand Staves in the same way.

Add to Auto Layout Distance

This number is added to the distance between staves that is added when you use any of the Auto Layout functions. The higher the number, the larger the distance between staves.

‘Spread Page’ Bottom Distance

This is added to the white space that appears on the bottom of a page when using the Spread Page functions.

Max. Number of Bars

This allows you to specify the maximum number of bars per staff when using the “Bars and Staves” or “Optimize All” functions.

NOTE

The functions “Move Bars” and “Move All Bars” (“Move Bars” + “All Pages”) can also be accessed via the Staff context menu (opened by right-clicking on the blue rectangle to the left of the active staff).

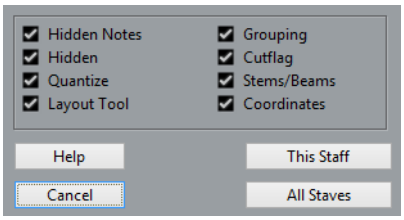
Reset Layout

This function allows you to delete invisible layout elements, which in effect restores the score to default settings.

PROCEDURE

1. Select “Reset Layout…” from the Scores menu.
   The Reset Layout dialog appears.
2. Activate the items you want to delete or reset to standard settings.
3. Click on “This Staff” to clean up the active staff only, or on “All Staves” to clean up all staves in the score.

Reset Layout Options



Hidden Notes

Makes all hidden notes permanently visible again.

Hidden

Makes all other hidden objects permanently visible again.

Quantize

Deletes all Display Quantize elements.

Layout Tool

Resets all positions of notes, clefs, slurs and ties altered using the Layout tool.

Grouping

Resets the grouping under beams to standard values.

Cutflag

Deletes all cutflag events.

Stems/Beams

Resets the length of all stems and reset the slant of beams that have been manually adjusted.

Coordinates

Removes all manual spacing of note symbols and slurs.

Breaking bar lines

Sometimes you may not want a bar line to stretch all the way across a grand staff. If this is the case, you have the possibility to “break it”.

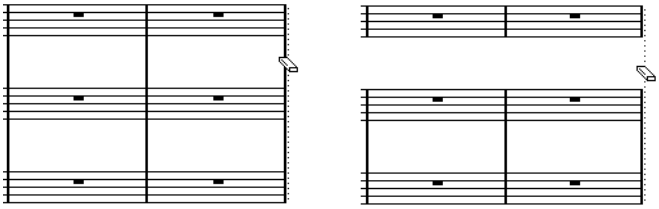
Manually

You can break the bar lines in one grand staff or in several grand staves and re-connect them.

Breaking bar lines in one grand staff

PROCEDURE

1. Select the Erase tool.
2. Click on a bar line connecting the two staves.



Before and after splitting the bar lines between two staves.

All bar lines between these two staves (except the first and last) are broken. To break the first or last bar line in a grand staff, you need to click directly on these.

Breaking bar lines in several grand staves

If you hold down [Alt]/[Option] and click on a bar line as described above, the corresponding bar lines are broken in all following grand staves.

Re-connecting broken bar lines

If you have broken the bar lines, you can use the Glue tool to connect them again.

PROCEDURE

1. Select the Glue tool.
2. Click on one of the bar lines in the staff above the broken bar lines.

   All bar lines between these staves in this grand staff are connected.

   To re-connect bar lines in several grand staves, hold down [Alt]/[Option] and click with the Glue tool.

   The bar lines between the corresponding staves are connected in all following grand staves.

Automatically

If you have added brackets for some staves on the Layout page of the Score Settings dialog, you can have bar lines broken between each bracketed “section”, giving a clearer indication of which staves belong together:

PROCEDURE

1. Open the Score Settings dialog from the Score menu and, on the Project page, select the “Notation Style” subpage.
2. In the Bar Lines section, locate and activate the “Break Bar Lines with Brackets” option.

   The option Break Last Brackets determines whether the breaking of bar lines should also apply to the bar line at the end of each row.

RELATED LINKS

Adding brackets and braces on page 1493

Scoring for drums

About this chapter

In this chapter you will learn:

- How to set up the drum map.
- How to set up a staff for drum notes.
- How to enter and edit drum notes.
- How to use a single line drum staff.

Background: Drum maps in the Score Editor

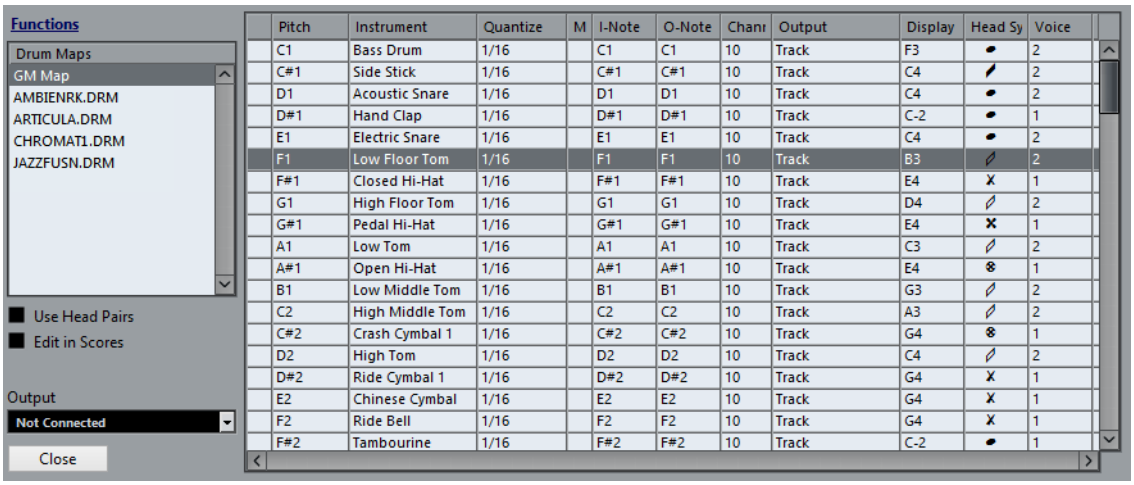
When scoring for drums, you can assign a unique note head to each pitch. There is even the possibility to set up different note heads for different note values!

However, to be able to fully use this function, you need to understand a bit about drum maps, and the use of these in the Score Editor.

About drum maps

Nuendo handles drum editing by means of drum maps. In the Score Editor, the drum map displays different note heads for different pitches.

You access the drum map by selecting “Drum Map Setup” from the MIDI menu.

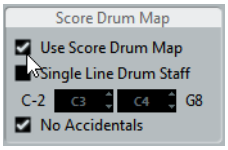


RELATED LINKS

MIDI Editors on page 777

Use Score Drum Map on/off

For the drum map settings to be used in the score, you need to activate the “Use Score Drum Map” option in the Score Settings dialog on the Staff page (Options tab).



Setting up the drum map

To set up the drum map, proceed as follows:

PROCEDURE

1. Open the Score Editor for the drums track.
   This should be a MIDI track to which you have assigned a drum map.
2. Open the Score Settings dialog and select the Staff page.
3. Select the Options tab and activate the “Use Score Drum Map” option.
4. On the MIDI menu, select “Drum Map Setup”.
   The Drum Map Setup dialog appears.

5. Make settings for the sounds/MIDI notes you need.

IMPORTANT

Please note that many different drum maps can be created for a project. Which one you get depends on which drum map is assigned to the edited track. These drum maps are totally independent of one another, i.e. each pitch can have different settings in different drum maps.

Score related options

Pitch

This corresponds to the I-note of the sound in the drum map, and cannot be edited here.

Instrument

The name of the drum sound in the map.

Display Note

The display pitch, i.e. the pitch at which the note is shown in the score. For example, you typically want all three hi-hat sounds to be shown on the same system line in the score (but with different symbols). Therefore, you set these to the same display pitch.

Head Symbol

Clicking in this column opens a window in which you can select a note head symbol for the sound. If “Use Head Pairs” is activated in the dialog, you can select a note head pair instead.

Voice

This allows you to make all notes with this pitch belong to a certain voice, so that they get a common rest handling and stem direction, for example.

Initializing the display pitches

If you select “Init Display Notes” from the Functions pop-up menu in the top left corner of the Drum Map Setup dialog, all display pitch values are reset, so that actual pitch and display pitch are the same for each sound/note.

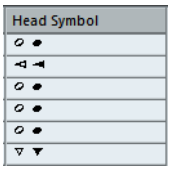
Using note head pairs

Not only can you have different drum sounds displayed with different note heads, you can also display different note heads for different note values:

PROCEDURE

1. Activate the “Use Head Pairs” checkbox.

   The “Head Symbol” column now shows two head symbols for each drum sound.



All head symbols are arranged in pairs – by default an “empty” head and a “filled” head. Just as with regular notes, the “empty” note heads are used with half notes and larger note values, and the “filled” heads are used with quarter notes and smaller note values.

2. To select a head pair for a drum sound/note, click in the Head symbol column to open the pop-up menu and choose the new head pair.

Customizing note head pairs

If you do not like the default pairs of note heads, you can edit these:

PROCEDURE

1. On the Functions pop-up menu, select “Edit head pairs”.
2. To change a symbol in a pair, click on it and select a new symbol from the pop-up menu.
3. When you are done, click Exit to close the dialog.

Editing the drum map in the score

If you activate the “Edit in Scores” option in the Drum Map Setup dialog, you can change the settings for the score drum map directly in the score:

- Transposing a note changes the display pitch of its drum sound – the actual note is not transposed.
- Double-clicking a note allows you to make note head settings for that drum sound.
- Using the “Move to Voice” function changes the voice assignment of the drum sound.

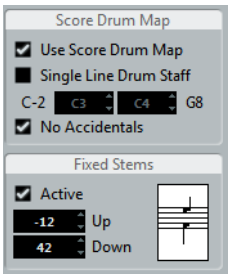
NOTE

This requires that you leave the Drum Map Setup dialog open – closing the dialog automatically deactivates this option, allowing you to perform normal editing.

Setting up a staff for drum scoring

PROCEDURE

1. Open the Score Settings dialog on the Staff page and select the Options tab.
2. Make sure that “Use Score Drum Map” is activated.
3. If you want a single line drum staff, activate the corresponding option.
4. If you want flat beams, activate the corresponding option.
5. If you want all stems to end at the same position, activate Fixed Stems and set a length for up/down stems.



You may also want to use polyphonic voices to handle rest and stem separately. However, you can still activate the “Fixed Stems” option if you like.

RELATED LINKS

Using “Single Line Drum Staff” on page 1504
Polyphonic voicing on page 1517
Handling beaming on page 1384

Entering and editing notes

This is like entering notes on a normal note system. However, Notes are edited using their display pitch when the drum map is used. This means that when you move a note vertically, you move it to another display pitch. What actual pitch it gets depends on which pitch uses the display pitch you now “dropped it on”.

NOTE

If the drum map contains two notes with the same pitch (for example open and closed hi-hat), you can get the second note by holding [Ctrl]/[Command].

Using “Single Line Drum Staff”

When this option is activated on the Options tab of the Staff page in the Score Settings dialog, there is only one line in the system. Furthermore, notes can only appear below the line, on the line and above the line.

To decide which notes go where, proceed as follows:

PROCEDURE

1. Open the Score Settings dialog on the Staff page and select the Options tab.
2. Activate “Use Score Drum Map” and “Single Line Drum Staff”.
3. Set up the two pitch values to decide which pitches go on the line.

   Notes below this range automatically wind up below the line and notes above wind up above the line.

   IMPORTANT

   When you enter and edit the pitch of notes on a single line drum staff, the best way is to drag the note up or down while watching the Mouse Note Position display in the status line.

Creating tablature

About this chapter

In this chapter you will learn:

- How to create tablature, automatically and manually.
- How to control the appearance of the tablature notes.
- How to edit tablature.

Nuendo is able to produce score in tablature format. This can be done automatically, by “converting” recorded MIDI information. You can also create a tablature staff from scratch and enter the notes “by hand”.

IMPORTANT

Even though we use the term “converting” in this chapter, please note that tablature is a mode. You can switch between regular notation and tablature at any time.

Creating tablature automatically

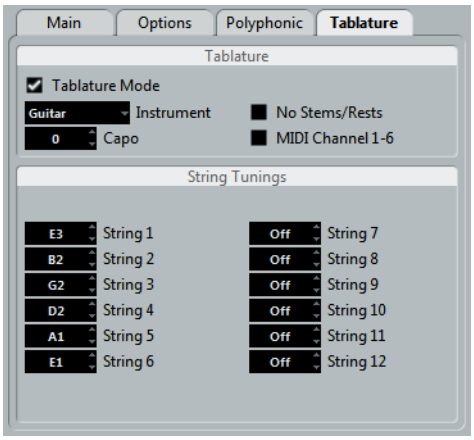
This assumes you have a regular score on screen already. We also suggest you perform basic editing like quantizing to make the score as legible as possible as regular notes before converting into tablature.

PROCEDURE

1. Make sure that the notes in the score are inside the range of the instrument.

   Notes with a pitch lower than the open tuning of the lowest string cannot be converted.

2. Open the Score Settings dialog on the Staff page and select the Tablature tab.



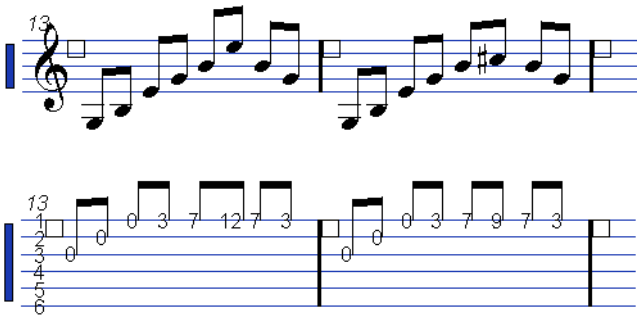
3. Activate “Tablature Mode”.
4. Select one of the predefined instruments from the pop-up menu.
   - If you are not using one of the predefined instruments, set the open tuning of each string using the value fields.

     You can create tablature for up to 12 strings. To disable a string, set it to Off, the lowest value.
5. If you want to use a capodaster, e.g. on the forth fret, enter the corresponding value in the Capo field.

   The tablature changes accordingly.
6. Make the desired settings for “No Stems/Rests” and “MIDI Channel 1–6”.

   No Stems/Rests gives you a score where the notes have no stems and where all the rests are hidden. The “MIDI Channel 1–6” feature is described below.
7. Click Apply.

   The tablature appears. You get as many note lines as you have activated strings. All the notes now have a fret number instead of their regular note heads.



Before and after activating tablature mode.

8. Edit the score, if needed.

   You can make Display Quantize settings, add symbols, etc. as usual. However, editing the actual notes is a bit different from regular note editing, see below.

Using “MIDI Channel 1–6”

This feature makes notes automatically appear on the correct string according to their MIDI channel value.

Normally, the program automatically decides on which string to display a note, by looking at the pitch and then putting the note at the lowest possible string. You can then either manually move a note to the correct string, or use the “MIDI Channel 1–6” option to let the program move the notes automatically.

PROCEDURE

1. Many guitar synthesizers are able to transmit each string on a different MIDI channel. If you have such an instrument, set it up so that the high E string transmits on MIDI channel 1, the B string transmits on MIDI channel 2, etc.

   This feature can be used for MIDI string instruments with up to six strings.
2. Record the project. Quantize and edit it as desired.
3. Make sure that the “MIDI Channel 1–6” option is activated and convert the notes into tablature, as described above.
4. The notes are automatically placed on the right strings.

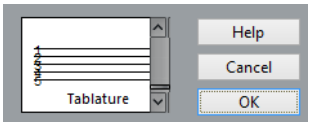
   For example if you played a “B” on the low E-string, it appears as a “7” on that string, not as a “2” on the A-string.

Creating tablature manually

To set up an empty system for inputting tablature, proceed as follows:

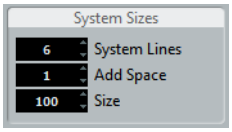
PROCEDURE

1. Double-click on the clef symbol in the score to open the Edit Clef dialog.
2. Change the clef to the tablature symbol.



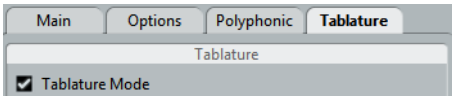
3. Open the Score Settings dialog on the Staff page and select the Options tab.
4. Set the “System Lines” to as many strings as the instrument you are scoring for has.
5. Raise the Add Space value to 1 or 2.

   You need a little extra space between note lines to make room for the numbered note heads.



Suggested system line settings for guitar tablature

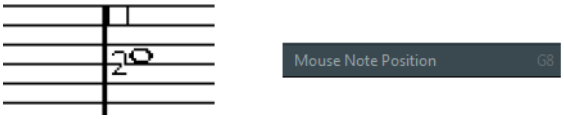
6. On the Tablature tab, activate “Tablature Mode”.



7. Set up whatever other parameters you need in the dialog, and click Apply.

8. Select the Insert Note tool and move the pointer over the score.
9. Press the mouse button and drag up and down until the note appears on the desired string with the correct fret number (you can also verify the pitch on the toolbar, as usual).

   When you drag up and down, the program automatically selects the lowest possible string. If you want a fret number higher than 4 on a guitar tablature, for example, you have to use “Move To String”, see below.

   Setting the correct pitch. Use the Mouse Note Position display in the status line as an additional guide.
10. Release the mouse button.

    The note is displayed.

Tablature number appearance

In the Score Settings dialog on the Project–Font Settings subpage, you can find settings for the tablature numbers. In the “Font For” pop-up menu, select “Tablatures” and then select the desired font, size, and style for the number note heads.

Editing

Tablature can be edited like any other score. You can move notes, handle beaming, stem direction, etc.

Moving notes to another string

If you want for example a “C” to appear as an “8” on the low E-string rather than a “3” on the A-string on a guitar, proceed as follows:

PROCEDURE

1. Select one note or a number of notes that you want to move to a new string.
2. Right-click on one of the selected notes and, from the “Move to String” submenu, select the desired string.

   The Fret number is automatically adjusted according to the tuning of the instrument (as set up on the Tablature tab of the Staff page in the Score Settings dialog).

Moving notes

Moving notes in pitch in a tablature score is working the same way as entering notes manually, see above.

Editing on the info line

You can change the pitch of notes on the info line as usual. The string and fret number are updated automatically in the score.

Note head shape

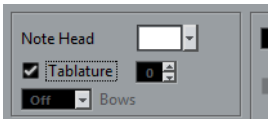
If you only want to enter a fret number for your notes (Tablature mode off), you can use the Set Note Info dialog on regular notes.

PROCEDURE

1. Double-click on the head of a note.

   The Set Note Info dialog appears.

2. Activate the Tablature option and set a fret number in the value field to the right.

3. Click Apply.

The score and MIDI playback

About this chapter

In this chapter you will learn:

- How to use the Arranger mode to have the playback follow the structure of the score.
- How to use the “mapped” Dynamics symbols.

NOTE

You can also play back articulations in the Score using the Expression Map and Note Expression functions.

RELATED LINKS

Expression maps (NEK only) on page 854
Note Expression (NEK only) on page 868

Scores and the Arranger mode

Repeats (bar lines) appear in all layouts, as well as Project symbols like Segnos, Codas, Da Capo, endings, etc. To have the playback in Nuendo follow these directions, proceed as follows:

PROCEDURE

1. Add the desired repeats and project symbols to the score.
2. Right-click the toolbar in the Score Editor and make sure that “Arranger” is ticked.

   This adds the Arranger buttons to the toolbar.

   
3. Click the “Activate Arranger Mode” button on the toolbar and start playback.

   Playback follows the repeats and Project symbols in the score – sections within repeat symbols are repeated, the playback position jumps to the beginning when encountering a Da Capo symbol, and so on.

Working with mapped dynamics

Apart from the dynamics symbols found on the Dynamics tab, you can also use 12 “mapped” Dynamics symbols. These make use of the Note Expression functionality in Nuendo. Mapped Dynamics symbols can be played back using three different methods: by modifying the velocity values in percentages, by sending volume controller messages or by sending additional generic controllers. These methods can also be combined.

RELATED LINKS

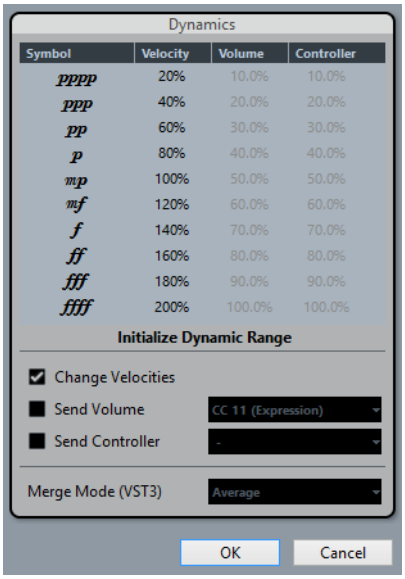
Note Expression (NEK only) on page 868

Setting up the symbols

You can make settings for the symbols in the Dynamics Mapping Setup dialog. On the left in the upper section, the available symbols are listed.

- To open the dialog, right-click on one of the symbols on the Dynamics Mapping tab in the Symbols Inspector and select “Dynamics Mapping…”.

  When mapped dynamics symbols have been added to the score, you can also double-click on a symbol to open the dialog.



In the dialog, you can make the following settings:

Change Velocities

You can create dynamics by defining different velocities for the different symbols.

PROCEDURE

1. Activate the “Change Velocities” checkbox in the lower section of the dialog.
2. Set up a percentage value (positive or negative) in the Velocity column to specify by how much the corresponding symbol will raise or reduce the current velocity value of a note.

Send Volume

You also have the possibility to define the dynamics by sending Volume controller values.

PROCEDURE

1. Activate “Send Volume” in the lower section of the dialog, and select whether you want to use the MIDI controllers 7 or 11 or the VST 3 parameter Volume (if the instrument you are using is compatible with VST 3).
2. Set up a percentage value (positive or negative) in the Volume column to specify by how much the corresponding symbol will raise or reduce the current volume of a note.

   NOTE

   When “Send Volume” is activated and set to VST 3 Volume, the VST 3 volume events in the notes are being merged with the volume specified for the Dynamics symbols, according to the Merge Mode setting, see below. However, make sure that the edited part does not contain events for MIDI controller 7 (Main Volume) or 11 (Expression) on the controller lane.

The Merge modes

When you use the parameter VST 3 Volume in the notes and for the dynamics symbols, the result depends on the Merge Mode. The following modes are available:

Average

When this is selected, the average of the two volume messages will be used for the notes.

Merge

When this is selected, the VST 3 Volume setting for the Dynamics symbols modulates the existing VST 3 Volume setting of the notes. Higher settings increase the volume and low settings decrease the volume set for the note.

Send Controller

You can also send an additional MIDI controller (except MIDI controllers 7 and 11, which are used for the “Send Volume” function).

If you combine this with the “Send Volume” function, you can set up a sound which gets brighter as it gets louder, which is useful when working with strings or woodwind and brass instruments.

PROCEDURE

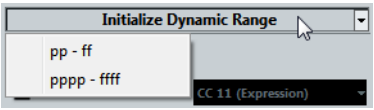
1. Activate “Send Controller” and specify the controller you want to use in the pop-up menu.

   You can select any of the available MIDI controllers, but also VST 3 parameters (except Volume, Pan, and Pitch).

2. Set up a percentage value (positive or negative) in the Controller column to specify by how much the corresponding symbol will raise or reduce the controller value of a note.

Initializing the Dynamic Range

You can specify the dynamic range for the work with mapped dynamics symbols using the pop-up menu in the middle section of the dialog.



If you select “pp-ff”, the extreme Dynamics symbols (pppp, ppp, ffff, and fff) do not have an effect. If you select “pppp-ffff”, the whole dynamic range will be used.

Using dynamics symbols in the Score Editor

Once you have set up the dynamics as desired, you can use the symbols in the Score Editor.

Inserting dynamics symbols

When you insert dynamics symbols, note the following:

- Select the desired symbol on the Inspector tab and click at the position in the Score Editor at which you want to insert the symbol.

  Note that the “mapped” dynamics symbols have a different color scheme than the regular dynamics symbols.

- Crescendi and Decrescendi are updated intelligently, i.e. when you have inserted a crescendo between two dynamics symbols and the order of these symbols is reversed, the decrescendo automatically becomes a crescendo.

- When you insert a crescendo symbol which is not preceded by a Dynamic symbol, the “assumed” start value is mezzo forte (mf).
- Likewise, if a crescendo symbol is not followed by a dynamic symbol, an end value will be calculated automatically.

  For a crescendo, this is one value above the start value, and for a decrescendo one value below the start value.

Modifying/Editing dynamics symbols

You can change the settings for the dynamics symbols at any time in the Dynamics Mapping Setup dialog, as described above.

- You can step between the available dynamics symbols by using the commands “One up” and “One down” on the context menu, by using the corresponding key commands, or by clicking the “+” and “-” buttons on the toolbar.

  When several dynamics symbols are selected, they will all be modified accordingly.

Tips and Tricks

Overview

This chapter provides useful information about editing techniques and answers to a number of questions that might arise when you use the Score Editor. For more information about the functions referred to, please use the index and check the previous chapters.

Useful editing techniques

Use this section to find out more about some editing techniques that help you to use the score functions more efficiently.

Moving a note without transposing it

If you hold down [Ctrl]/[Command] while moving a note (or several notes), only horizontal movements are possible, so that you do not have to worry about the notes being transposed. You can also set up a key command for this. This is done in the Key Commands dialog (Nudge category).

Moving and spacing several staves

If you have a number of staves that you want displayed with an equal distance (for example, all strings of a grand staff in a full orchestra score), this can be done using the Position Info window:

PROCEDURE

1. Open the Preferences (Scores–Editing page) and deactivate the “Global staff Spacing with [Alt]/[Option]-[Ctrl]/[Command]” option.
2. In the score, select the staves you want to set to an equal distance.
3. Open the Position Info window by clicking on the ruler.

4. Use the To Previous Staff or To Next Staff settings to specify the desired distance between the staves.

   All selected staves are spaced according to your settings.

   If you do this when the “Global staff Spacing with [Alt]/[Option]-[Ctrl]/[Command]” option is activated, all staves in the score are affected.

Polyphonic voicing

If you are working on a full score with more than one instrument in one staff (2 flutes, 2 trumpets, etc.), you should use polyphonic voices. And even if both instruments play the same notes, you should insert notes for both instruments (you can mute the notes of the second voice, if playback is an issue). If you do this, it is much easier to extract single parts later by using the “Extract Voices” command.

Using the bar handles

Double-clicking a bar handle opens the Bar Copy dialog. This function is great for copying accents, but you can also use it for copying drum phrases, etc.

- If you hold down [Shift] and double-click on a bar handle, this and the next bar are selected.

  This is handy when copying phrases of two or more bars in one go.

RELATED LINKS

Moving and duplicating with the bar handles on page 1425

Copying a section with “invisibles”

If you want to copy and paste a section which contains hidden elements, adjusted beams and stems, etc., there are two ways to proceed:

- Use the filter bar to make indicators appear in the score. Then select these indicators together with the notes before you copy.

  This ensures the notes are copied with their formatting, etc.

- Double-click the bar handle of one of the bars, and make sure all relevant event types are activated in the dialog. Then select the bars you want to copy by clicking their bar handles, and copy them by [Alt]/[Option]-dragging the bar handles.

RELATED LINKS

Moving and duplicating with the bar handles on page 1425

Using “Scores Notes To MIDI”

This function converts the score data, as displayed, into MIDI data. Let’s say for example that you have set up the score so that it is displayed to 99% the way you want it to be. Yet, that last 1% forces you to deactivate some of the Staff Settings (like Clean Lengths, No Overlap, or Auto Quantize), which makes other parts of the score illegible. In this case, try using the “Scores Notes To MIDI” function. Note that you should work on a copy of the track!

RELATED LINKS

Using "Scores Notes To MIDI" on page 1321

Optimizing rests

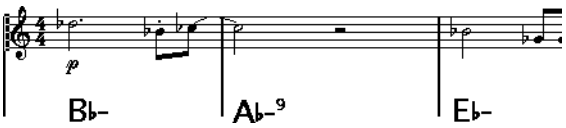
If you have a number of consecutive empty bars, you can replace them with one multiple rest.

RELATED LINKS

Multi-Rests on page 1478

Zero system lines

Having no system lines at all might seem like a stupid idea to start with. But this option allows you to create chord sheets really quickly.



A lead sheet created by specifying “0” system lines

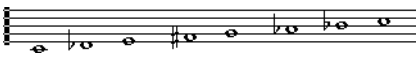
RELATED LINKS

Using Make Chord Symbols on page 1444

Examples and scales

If you are creating scale examples and similar, you can use the Real Book option and manually hide all symbols at the beginning of the first staff to make the score appear like separate unconnected “lines”.

Remember you can also hide the bar lines.

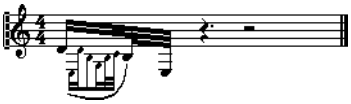


An example scale without bar lines.

Controlling the order and appearance of grace notes

Normally, grace notes are beamed. Their order under the beam is controlled by their order in the track. It is enough to put a grace note one tick before the next grace note to make them appear in the desired order under the beam.

Initially the grace notes are put in with a 32nd note beam. By double-clicking the note and changing the “flag” type in the Set Note Info dialog, you can change this.



Complex grace notes

Speeding up inserting key changes

If you have a grand staff with many instruments, inserting key changes one by one can take a lot of time.

In this case, activate “Key Changes for the entire Project” on the Key context menu or in the Score Settings dialog, on the Project–Notation Style subpage (Keys category). This way, all changes made to the key always affect the entire project.

Speeding up inserting staccato and accents

Symbols linked to notes can also be put in for a number of notes at the same time, even on different staves.

RELATED LINKS

Adding a symbol to several notes using the Draw tool on page 1410

Setting the distance between staves in a piano score

Drag the first bass staff on the first page. This copies the spacing to all staves. Please note that this can only be done in Page Mode.

Frequently asked questions

In this section, you can find some answers to questions concerning adding and editing of notes as well as the handling of symbols and layouts.

I enter a note with one value and it is shown as a note with another value.

Set the Rests value for Display Quantize to a smaller note value. Try deactivating Auto Quantize, especially if you do not have any triplets or triplets only.

Notes are not displayed at the correct positions.

Try changing the Notes value for Display Quantize.

There are a number of short rests after my notes.

Your Rests value for Display Quantize might be set to too small a note value. Raise it. Also check the “Clean Lengths” setting.

When I change the length of a note, nothing happens.

This is because the Display Quantize value puts a restriction on what note values can be displayed. Check that Display Quantize is set to the smallest note value you have in your project.

I have adjusted Display Quantize and the other staff settings best I can. The notes are still shown with the wrong values.

You might need to use one of these three features: inserting Display Quantize events, using polyphonic voicing, or applying “Scores Notes To MIDI”.

In the Score Settings dialog, I change the Display Quantize settings on the Staff page (Main subpage) and nothing happens.

Did you remember to click Apply? Maybe you have already inserted Display Quantize events in the score? These override the staff settings.

Suddenly many Display Quantize events appear in the score.

This is not a malfunction. If you had Auto Quantize on and start inserting Display Quantize events, the auto quantizing is automatically transformed into Display Quantize events.

One long note is shown as many tied notes.

Do other notes occur at the same positions but with different lengths? Then you need to use polyphonic voicing. Are the note(s) syncopated? Then you should try the syncopation feature.

Even though I've tried the above, notes are not tied as I want them.

The way notes are tied in Nuendo follows basic notation rules. You may need to make exceptions to these rules, by using the Cut Notes tool.

I have an unnecessarily large amount of rests.

Especially with polyphonic voicing, superfluous rests may be created. Try deactivating rests for one or more voices. You might also leave the rests activated in the Score Settings dialog on the Staff page (Polyphonic tab) and then hide the rests you do not need, one by one.

When using polyphonic voices, a number of rests are drawn on top of each other.

As above, you should try hiding rests in the Score Settings dialog on the Staff page (Polyphonic tab), center rests and possibly manually moving or hiding rests.

In polyphonic voices, notes that are on the same musical position are not displayed exactly vertically above each other.

This is not a malfunction. Nuendo has built-in automatic algorithms for making the score as legible as possible. Sometimes this includes adjustments of the "graphic" position of notes, especially with small intervals like seconds. You can always move the notes using the Layout tool.

When using polyphonic voices, notes with small intervals "collide".

As described above, Nuendo tries to avoid this, but only for voices 1 and 2 in the upper staff and voices 5 and 6 in the lower. For other voices, please use the Layout tool to manually move the notes.

When I select a note, nothing is shown on the info line.

The note is probably tied to another note. This means that the second note does not really exist, it is just a graphic indication that the main note is long. Try selecting the main note instead.

Symbols from the Layout Symbols tab are sometimes invisible when I open the score.

This is not a malfunction. Those symbols are part of a layout. If you open the score with another layout, for example because you open another combination of tracks, you can see another layout which might not contain any Symbols at all.

RELATED LINKS

Working with layouts on page 1466

I can't select an object on the screen, or I can't select an object without selecting another object.

Drag a selection rectangle around the objects. Then hold down [Shift] and deselect all the objects you do not want included, by clicking on them. You should also check out the lock layer function.

Symbols have disappeared.

Are they layout symbols? Then maybe they belong to another layout than the one you are editing now.

If that is not the reason, maybe you have inserted the symbol into the wrong staff.

RELATED LINKS

Important! – Symbols, staves, and voices on page 1408

A symbol doesn't move with its staff. Auto Layout produces far too wide spacing.

Maybe you have inserted the symbol into the wrong staff.

RELATED LINKS

Important! – Symbols, staves, and voices on page 1408

A note symbol appears too far from the note I wanted it inserted on.

Do you have activated the correct voice? Note symbols are inserted into voices, just like notes.

The note I recorded is displayed with the wrong length. For example, I recorded a sixteenth and got a quarter note.

You probably have the wrong Display Quantize value set. Open the Score Settings dialog and select the Staff page. If Auto Quantize is activated, deactivate it, unless you have mixed triplets and regular notes. Also check the Notes and Rests Display Quantize values. If the settings are too “coarse”, change them to a smaller note value. If you for example need the program to display an eighth note rest, Rests Display Quantize must be set to “8” or a smaller value. If No Overlap is activated, you might want to turn it off.

RELATED LINKS

How the Score Editor works on page 1286

There is a pause after a note that I don’t want.

You probably added a note with the wrong note value. Either lengthen the note (physically or graphically) or delete the one you have and add a new one with the correct note value. If this problem occurs a lot in your score, try selecting a larger Rests Display Quantize value.

RELATED LINKS

Changing the length of notes on page 1339
Deleting notes on page 1346
Using Rests as Display Quantize setting on page 1289

There is no pause after the note although there should be one.

Either the note is too long (use Clean Lengths or change the current note’s length), or Rests Display Quantize is set to too high a value. Open the Score Settings, select the Staff page and lower the value.

The note has an accidental when it shouldn't, or it doesn't when it should.

Maybe the note is simply of the wrong pitch? Click on it (using the Object Selection tool) and look at the info line. Move it to the correct pitch. If this is not the reason, maybe you have the wrong key set? And finally, you can also use enharmonic shifting.

RELATED LINKS

The info line on page 1299
Editing pitches of individual notes on page 1337
Accidentals and enharmonic shift on page 1377

Notes are not grouped under beams the way I want it.

Normally the program groups eighth notes, sixteenths, etc. under beams. This can be deactivated. There is also detailed control of which notes are grouped under a beam.

RELATED LINKS

Handling beaming on page 1384

If you wish you had a faster computer

Here are some tips for those who find some operations slower than they would like:

- Work on a smaller section of the score at a time. Break the project up into parts and work on those parts individually until the final layout stage.
- Switch on multi-rests as late as possible.
- When working in Edit Mode, set Default Bars Across The Staff to a small value, for example 2.
- In Edit Mode, resize the window so that only one grand staff at a time is visible.
- Consider upgrading your computer hardware.

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