NUENDO 5 EXPANSION KIT

Cubase Music Tools For Nuendo 5

steinberg

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About this manual

Welcome!

This is the manual for Steinberg's Nuendo Expansion Kit. The Nuendo Expansion Kit adds a number of music composition functions from Steinberg's Cubase (the "Cubase Music Tools") to your Nuendo application.

These features and functions, or more precisely the included VST instruments, the Drum Editor (and drum map support), the handling of VST expression maps as well as the Score Editor are described in detail in the following chapters.

About the program versions

The documentation covers two different operating systems or "platforms"; Windows and Mac OS X.

Some features and settings are specific to one of the platforms. This is clearly stated in the applicable cases. In other words:

⇨ If nothing else is said, all descriptions and procedures in the documentation are valid for both Windows and Mac OS X.

Key command 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] under Windows and [Command]-[Z] under 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] under Windows or [Command] under Mac OS X, then press [Z]".

Similarly, [Alt]/[Option]-[X] means "press [Alt] under Windows or [Option] under Mac OS X, then press [X]".

⇨ Please note that this manual often refers to right-clicking, e.g. to open context menus, etc. If you are using a Mac with a single-button mouse, hold down [Ctrl] and click.

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System requirements and installation

About this chapter

This chapter describes the requirements and installation procedures for the Windows version and the Mac version.

Minimum requirements

Your computer must meet the following requirements:

Windows

- Windows XP (Home or Professional, Service Pack 2, 32-bit), or Windows Vista (32-bit and 64-bit), or Windows 7 (32-bit and 64-bit)
- 2 GHz processor (Dual Core processor recommended)
- 1024 MB RAM
- Windows DirectX compatible audio hardware; ASIO compatible audio hardware recommended for low latency performance.
- Display resolution of 1280x800 pixels recommended
- 4 GB of free hard disk space
- QuickTime 7.1 and video card supporting OpenGL 1.2 (OpenGL 2.0 recommended) required for video playback
- USB-eLicenser and USB component connector
- DVD ROM drive required for installation
- Internet connection required for license activation

Macintosh

- Mac OS X 10.5.8 or 10.6
- Intel Core processor (Intel Core Duo recommended)
- 1024 MB RAM
- CoreAudio compatible audio hardware
- Display resolution of 1280x800 pixels
- 4 GB of free hard disk space
- QuickTime 7.1 and video card supporting OpenGL 1.2 (OpenGL 2.0 recommended) required for video playback
- USB-eLicenser and USB component connector
- DVD ROM drive required for installation
- Internet connection required for license activation

Installing the Nuendo Expansion Kit

The installation procedure puts all files in the right places, automatically.

Windows

1. Insert the Nuendo Expansion Kit DVD into the DVD drive of you computer.
2. Double-click the file called “Setup.exe”.
3. Follow the instructions on screen.
The installation process also includes the activation of the program license on your USB-eLicenser. This is the same procedure as for Nuendo.

Macintosh

1. Insert the Nuendo Expansion Kit DVD into the DVD drive of you computer.
2. Double-click the file “Nuendo Expansion Kit 5.mpkg”.
3. Follow the instructions on screen.
The installation process also includes the activation of the program license on your USB-eLicenser. This is the same procedure as for Nuendo.

Register your software

We encourage you to register your software! By doing so you are entitled to technical support and kept aware of updates and other news about your product.

There are two ways to register:

- In Nuendo, open the Help menu and select the Registration option.
This option is an Internet link that opens the Registration page of the Steinberg web site. To register, simply follow the instructions on screen. When you launch Nuendo, you also get prompted to launch the registration process.

- Included on the installation DVD, you can find a registration form in PDF format. To register, print out the form, enter all required information and send it to Steinberg.

3

The included VST instruments

Introduction

This chapter contains descriptions of the included VST instruments and their parameters.

⇨ Most of the included instruments are compatible with VST3, this is indicated by an icon in front of the name (for further information, see the section “About VST 3” in the chapter “Audio effects” in the Operation Manual).

Prologue

Prologue is modelled on subtractive synthesis, the method used in classic analog synthesizers. It has the following basic features:

- Multimode filter

Variable slope low pass and high pass, plus band pass and notch filter modes – see “About the filter types” on page 16.

- Three oscillators, each with 4 standard waveforms plus an assortment of specialized waveforms.

See “Selecting Waveforms” on page 12.

- Frequency modulation.

See “About frequency modulation” on page 14.

- Ring Modulation.

See “Ring modulation” on page 15.

- Built-in effects.

See “Effects (EFX) page” on page 20.

- Prologue receives MIDI in Omni mode (on all MIDI channels).

You do not have to select a MIDI channel to direct MIDI to the Prologue.

⇨ The signal flow of the Prologue synth is illustrated in the section “Diagrams” on page 52.

Sound parameters

Oscillator section

This section contains parameters affecting the 3 oscillators. These are located in upper half of the instrument panel.

Selecting Waveforms

Each oscillator has a number of waveforms which are selectable by clicking on the waveform name in the box located in each oscillator section.

The following waveforms are available:

Waveform	Description
Sawtooth	This waveform contains all harmonics and produces a bright and rich sound.
Parabolic	This can be described as a “rounded” sawtooth waveform, producing a softer timbre.
Square	Square waveforms only contain odd number harmonics, which produces a distinct, hollow sound.

Waveform	Description
Triangle	The triangle waveform generates only a few harmonics, spaced at odd harmonic numbers, which produces a slightly hollow sound.
Sine	The sine wave is the simplest possible waveform, with no harmonics (overtones). The sine wave produces a neutral, soft timbre.
Formant 1–12	Formant waveforms emphasizes certain frequency bands. Like the human voice, musical instruments have a fixed set of formants, which give it a unique, recognizable tonal color or timbre, regardless of pitch.
Vocal 1–7	These are also formant waveforms, but specifically vocal-oriented. Vowel sounds (A/E/I/O/U) are among the waveforms found in this category.
Partial 1–7	Partials, also called harmonics or overtones, are a series of tones which accompany the prime tone (fundamental). These waveforms can be described as producing intervals with two or more frequencies heard simultaneously with equal strength.
Reso Pulse 1–12	This waveform category begins with a complex waveform (Reso Pulse 1), that emphasizes the fundamental frequency (prime). For each consecutive waveform in this category, the next harmonic in the harmonic series is emphasized.
Slope 1–12	This waveform category begins with a complex waveform (Slope 1), with gradually decreasing harmonic complexity the higher the number selected. Slope 12 produces a sine wave (no harmonics).
Neg Slope 1–9	This category also begins with a complex waveform (NegSlope 1), but with gradually decreasing low frequency content the higher the number selected.

- To hear the signal generated by the oscillator(s), the corresponding Osc controls in the oscillator sections must be turned clockwise to a suitable value.

OSC 1 parameters

Oscillator 1 acts as a master oscillator. It determines the base pitch for all three oscillators. Oscillator 1 features the following parameters:

Parameter	Description
Osc 1 (0–100)	This controls the output level of the oscillator.
Coarse (±48 semitones)	This determines the base pitch used by all oscillators.
Fine (±50 cent)	Fine tunes the oscillator pitch in cent increments (100th of a semitone). This also affects all oscillators.
Wave Mod (±50)	This parameter is only active if the Wave Mod button is activated beside the waveform selection box. Wave modulation works by adding a phase-shifted copy of the oscillator output to itself, which produces waveform variations. For example if a sawtooth waveform is used, activating WM produces a pulse waveform. By modulating the WM parameter with for example an LFO, classic PWM (pulse width modulation) is produced. However, wave modulation can be applied to any waveform.
Phase button (On/Off)	When Phase synchronization is activated, all oscillators restart their waveform cycles with every note played. With Phase deactivated, the oscillators generate a waveform cycle continuously, which produces slight variations when playing as each note starts from a random phase in the cycle, adding warmth to the sound. But when synthesizing bass sounds or drum sounds, it is usually desired that the attack of every note played sounds the same, so for these purposes activate Phase sync. Phase sync also affects the noise generator.
Tracking button (On/Off)	When Tracking is activated, the oscillator pitch tracks the notes played on the keyboard. If Tracking is deactivated, the oscillator pitch remains constant, regardless of what note is played.
Wave Mod button (On/Off)	This switches wave modulation on or off.
Waveform pop-up menu (see "Selecting Waveforms" on page 12)	Sets the basic waveform for the oscillator.

OSC 2 parameters

Oscillator 2 has the following parameters:

Parameter	Description
Osc 2 (0–100)	This controls the output level of the oscillator.
Coarse (±48 semitones)	This determines the coarse pitch for Osc 2. If FM is enabled, this determines frequency ratio of the oscillator regarding Osc 1.
Fine (±50 cent)	Fine tunes the oscillator pitch in cent increments (100th of a semitone). If FM is enabled, this determines the frequency ratio of the oscillator regarding Osc 1.
Wave Mod (±50)	This parameter is only active if the Wave Mod button is activated beside the waveform selection box. Wave modulation works by adding a phase-shifted copy of the oscillator output to itself, which produces waveform variations. For example if a sawtooth waveform is used, activating WM produces a pulse waveform. By modulating the WM parameter with for example an LFO, classic PWM (pulse width modulation) is produced. However, wave modulation can be applied to any waveform.

Parameter	Description
Ratio (1–16)	This parameter (which is only active if the Freq Mod button is activated) adjusts the amount of frequency modulation applied to oscillator 2, see "About frequency modulation" on page 14. Is normally referred to as FM index.
Sync button (On/Off)	When Sync is activated, Osc 2 is slaved to Osc 1. This means that every time Osc 1 completes its cycle, Osc 2 is forced to reset (start its cycle from the beginning). This produces a characteristic sound, suitable for lead playing. Osc 1 determines the pitch, and varying the pitch of Osc 2 produces changes in timbre. For classic sync sounds, try modulating the pitch of Osc 2 with an envelope or an LFO. The Osc 2 pitch should also be set higher than the pitch of Osc 1.
Tracking button (On/Off)	When Tracking is activated, the oscillator pitch tracks the notes played on the keyboard. If Tracking is deactivated, the oscillator pitch remains constant, regardless of what note is played.
Freq Mod button (On/Off)	This switches frequency modulation on or off.
Wave Mod button (On/Off)	This switches wave modulation on or off.
Waveform pop-up menu (see "Selecting Waveforms" on page 12)	Sets the basic waveform for the oscillator.

OSC 3 parameters

Oscillator 3 has the following parameters:

Parameter	Description
Osc 3 (0–100)	This controls the output level of the oscillator.
Coarse (±48 semitones)	This determines the coarse pitch for Osc 3. If FM is enabled, this determines the frequency ratio of the oscillator regarding Osc 1/2.
Fine (±50 cent)	Fine tunes the oscillator pitch in cent increments (100th of a semitone). If FM is enabled, this determines the frequency ratio of the oscillator regarding Osc 1/2.
Ratio (1–16)	This parameter (which is only active if the Freq Mod button is activated) adjusts the amount of frequency modulation applied to oscillator 3, see "About frequency modulation" on page 14. Is normally referred to as FM index.
Sync button (On/Off)	When Sync is activated, Osc 3 is slaved to Osc 1. This means that every time Osc 1 completes its cycle, Osc 3 is forced to reset (start its cycle from the beginning). This produces a characteristic sound, suitable for lead playing. Osc 1 determines the pitch, and varying the pitch of Osc 3 produces changes in timbre. For classic sync sounds, try modulating the pitch of Osc 3 with an envelope or an LFO. The Osc 3 pitch should also be set higher than the pitch of Osc 1.
Tracking button (On/Off)	When Tracking is activated, the oscillator pitch tracks the notes played on the keyboard. If Tracking is deactivated, the oscillator pitch remains constant, regardless of what note is played.
Freq Mod button (On/Off)	This switches frequency modulation on or off.
Wave Mod button (On/Off)	This switches wave modulation on or off.
Waveform pop-up menu (see "Selecting Waveforms" on page 12)	Sets the basic waveform for the oscillator.

About frequency modulation

Frequency modulation or FM means that the frequency of one oscillator (called the carrier) is modulated by the frequency of another oscillator (called the modulator).

- In Prologue, Osc 1 is the modulator, and Osc 2 and 3 are carriers.

  Osc 2 could be said to be both carrier and modulator as if Freq Mod is applied to Osc 2 it is modulated by Osc 3. If Osc 2 also uses frequency modulation, Osc 3 is modulated by both Osc 1 and Osc 2.

- The "pure" sound of frequency modulation is output through the modulator oscillator(s).

  This means that you should turn off the Osc 1 output when using frequency modulation.

- The Freq Mod button switches frequency modulation on or off.

- The Ratio parameter determines the amount of frequency modulation.

Portamento

This parameter makes the pitch glide between the notes you play. The parameter setting determines the time it takes for the pitch to glide from one note to the next. Turn the knob clockwise for longer glide time.

The "Mode" switch allows you to apply glide only when you play a legato note (when switch is set to Legato). Legato is when you play a note without releasing the previously played note. Note that Legato mode only works with monophonic parts.

Ring modulation

Ring modulators multiply two audio signals. The ring-modulated output contains added frequencies generated by the sum of, and the difference between, the frequencies of the two signals. In Prologue, Osc 1 is multiplied with Osc 2 to produce sum and difference frequencies. Ring modulation is often used to create bell-like sounds.

- To hear the ring modulation, turn down the output level for Osc 1 and 2, and turn up the “R.Mod” level all the way.
- If Osc 1 and 2 are tuned to the same frequency, and no modulation is applied to the Osc 2 pitch, nothing much happens.

However, if you change the pitch of Osc 2, drastic changes in timbre can be heard. If the oscillators are tuned to a harmonic interval such as a fifth or octave, the ring modulated output sounds harmonic, other intervals produce inharmonious, complex timbres.

- Deactivate Oscillator Sync when using ring modulation.

Noise generator

A noise generator generates noise (all frequencies at equal levels). Applications include simulating drum sounds and breath sounds for wind instruments.

- To hear only the sound of the noise generator, turn down the output level for the oscillators, and turn up the Noise parameter.
- The noise generator level is routed to Envelope 1 by default.

See “Envelope page” on page 18 for a description of the Envelope generators.

Filter section

The circle in the middle contains the filter parameters. The central control sets the filter cutoff parameter and the outer ring the filter type:

Parameter	Description
Filter type	Sets the filter type to either low pass, high pass, band pass or notch. The filter types are described in the table below.
Cutoff	This knob controls the filter frequency or “cutoff”. If a low pass filter is used, it could be said to control the opening and closing of the filter, producing the classic “sweeping” synthesizer sound. How this parameter operates is governed by the filter type mode (see the table below).
Emphasis	This is the resonance control for the filter. For low pass and high pass filters, raising the Emphasis value emphasizes the frequencies around the set cutoff frequency. This produces a generally thinner sound, but with a sharper, more pronounced cutoff sweep. The higher the filter Emphasis value, the more resonant the sound becomes until it starts to ring (self-oscillate), generating a distinct pitch. For Band pass or Notch filters, the Emphasis setting adjusts the width of the band. When you raise the value, the band where frequencies are let through (Band pass), or cut (Notch) becomes narrower.
Drive	This can be used to adjust the filter input level. Levels above 0dB gradually introduce a soft distortion of the input signal, and a decrease of the filter resonance.
Shift	Internally, each filter consists of two or more “subfilters” connected in series. This parameter shifts the cutoff frequency of the subfilters. The result depends on the selected filter type: For Low pass and High pass filter types it changes the filter slope. For Band pass and Notch filter types it changes the bandwidth. The Shift parameter has no effect if either the 12dB LP or 12dB HP filter type is selected.
Tracking	If this parameter is set to values over the 12 o’clock position, the filter cutoff frequency increases the further up on the keyboard you play. Negative values invert this relationship. If the Tracking parameter is set fully clockwise, the cutoff frequency tracks the keyboard by a semitone per key.

About the filter types

You select which filter type to use using the buttons around the filter cutoff knob. The following filter types are available (listed clockwise from 9 o'clock):

Type	Description
12db LP	Low pass filters let low frequencies pass and cut out the high frequencies. This low pass filter has a gentler slope (12dB/Octave above the cutoff frequency), leaving more of the harmonics in the filtered sound.
18dB LP	This low pass filter also has a cascade design, attenuating frequencies above the cutoff frequency with a 18dB/Octave slope, as used in the classic TB 303 synth.
24dB LP	This filter type attenuates frequencies above the cutoff frequency with a 24dB/Octave slope, which produces a warm and fat sound.
24dB LP II	This low pass filter has a cascade design which attenuates frequencies above the cutoff frequency with a 24dB/Octave slope, which produces a warm and dark sound.
12dB Band	This band pass filter cuts both high and low frequencies above and below the cutoff frequency with a 12dB/Octave slope, producing a nasal and thin sound.
12dB Notch	This notch filter cuts off frequencies near the cutoff frequency by 12dB/Octave, letting the frequencies below and above through. This produces a phaser-like sound.
12dB HP	A high pass filter is the opposite of a low pass filter, cutting out the lower frequencies and letting the high frequencies pass. This high pass filter has a 12dB/Octave slope, giving a bright and thin sound.
24dB HP	This filter has a 24dB/Octave slope, giving a bright and sharp sound.

Master Volume and Pan

The master Volume controls the master volume (amplitude) of the instrument. By default this parameter is controlled by Envelope 1, to generate an amplitude envelope for the oscillators.

The Pan knob controls the position in the stereo spectrum for the instrument. You can use Pan as a modulation destination.

Modulation and controllers

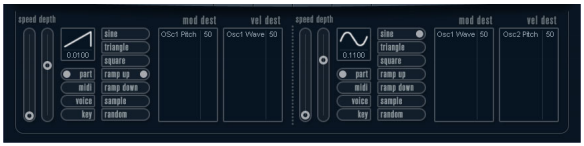
The lower half of the control panel displays the various modulation and controller assignment pages available as well as the effect page. You switch between these pages using the buttons below the Filter section.

The following pages are available:

- The LFO page has two low frequency oscillators (LFOs) for modulating parameters – see below.
- The Envelope page contains the four Envelope generators which can be assigned to control parameters – see "Envelope page" on page 18.
- The Event page contains the common MIDI controllers (Mod wheel, Aftertouch, etc.) and their assignments – see "Event page" on page 20.
- The Effect page has three separate effect types available; Distortion, Delay and Modulation – see "Effects (EFX) page" on page 20.

LFO page

The LFO page is opened by clicking the LFO button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for two independent LFOs.



Depending on the currently selected preset, there may already be modulation destinations assigned, in which case these are listed in the "Mod Dest" box for each LFO – see "Assigning LFO modulation destinations" on page 17. A low frequency oscillator (LFO) is used for modulating parameters, for example the pitch of an oscillator (to produce vibrato), or for any parameter where cyclic modulation is desired.

The two LFOs have identical parameters:

Parameter	Description
Speed	This governs the rate of the LFO. If MIDI Sync is activated (see below), the available rate values are selectable as note values, e.g. beat increments of the sequencer tempo in Nuendo.
Depth	This controls the amount of modulation applied by the LFO. If set to zero, no modulation is applied.
Waveform	This sets the LFO waveform.
Sync mode (Part/MIDI/ Voice/Key)	This sets the sync mode for the LFO. See below for a description.

About the sync modes

The Sync modes determine how the LFO cycle affects the notes you play:

Parameter	Description
Part	In this mode, the LFO cycle is free running and affects all the voices in sync. “Free running” means that the LFO cycles continuously, and does not reset when a note is played.
MIDI	In this mode the LFO rate is synced in various beat increments to MIDI clock.
Voice	In this mode each voice in the Part has its own independent LFO cycle (the LFO is polyphonic). These cycles are also free running – each key down starts anywhere in the LFO cycle phase.
Key	Same as Voice except that it is not free running – for each key down the LFO cycle starts over.

About the waveforms

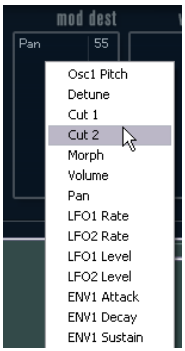
Most standard LFO waveforms are available for LFO modulation. You use Sine and Triangle waveforms for smooth modulation cycles, Square and Ramp up/down for different types of stepped modulation cycles and Random or Sample for random modulation. The Sample waveform is different. In this mode, one LFO actually samples and holds the values of the other LFO at the chosen frequency.

Assigning LFO modulation destinations

To assign a modulation destination for an LFO, proceed as follows:

1. Click in the “Mod Dest” box for one of the LFOs.

A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.



2. Select a destination, e.g. Filter Cut Off.

The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Select a suitable LFO Waveform, Speed, Depth, and Sync mode.

You should now hear the filter cutoff being modulated by the LFO.

4. Using the same basic method, you can add any number of modulation destinations for the LFO.

They are all listed in the “Mod Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Assigning LFO velocity destinations

You can also assign LFO modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the “Vel Dest” box for one of the LFOs.
A pop-up menu appears in which all possible velocity destinations are shown.

2. Select a destination.
The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the LFO.
They are all listed in the “Vel Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

LFO modulation velocity control – an example:

If you follow the steps above and select the filter cutoff parameter as a Velocity destination, the following happens:

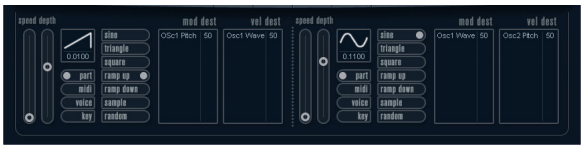
- The harder you strike the key, the more the filter cutoff parameter is modulated by the LFO.

- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the filter cutoff is modulated by the LFO.

Envelope page

The Envelope page is opened by clicking the ENV button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for the four independent envelope generators.

Envelope generators govern how a parameter value changes when a key is pressed, when a key is held and finally when a key is released.



On the Envelope page, the parameters for one of the four envelope generators is shown at a time.

- You switch between the four envelopes in the section to the left.
Clicking on either of the four mini curve displays 1 to 4 selects it and displays the corresponding envelope parameters to the right. The mini curve displays also reflect the envelope settings for each corresponding envelope.

- Envelope generators have four parameters; Attack, Decay, Sustain, and Release (ADSR).
See below for a description of these.

- You can set envelope parameters in two ways; either by using the sliders or by click-dragging the curve in the Envelope curve display.
You can also do this in the mini curve displays.

- By default Envelope 1 is assigned to the master volume, and therefore acts as an amplitude envelope. The amplitude envelope is used to adjust how the volume of the sound changes from the time you press a key until the key is released.
If no amplitude envelope were assigned, there would be no output.

The Envelope parameters are as follows:

Attack

The attack phase is the time it takes from zero to the maximum value. How long this takes is governed by the Attack setting. If the Attack is set to “0”, the maximum value is reached instantly. If this value is raised, it takes time before the maximum value is reached. Range is from 0.0 milliseconds to 91.1 seconds.

Decay

After the maximum value has been reached, the value starts to drop. How long this takes is governed by the Decay time parameter. The Decay time has no effect if the Sustain parameter is set to maximum. Range is from 0.0 milliseconds to 91.1 seconds.

Sustain

The Sustain parameter determines the level the envelope rests at after the Decay phase. Note that Sustain represents a level, whereas the other envelope parameters represent times. Range is from 0 to 100.

Release

Release determines the time it takes for the value to fall back to zero after releasing the key. Range is from 0.0 milliseconds to 91.1 seconds.

Punch

When Punch is activated, the start of the decay phase is delayed by a few milliseconds (i.e. the envelope remains at the top level for a moment before moving on to the decay phase). The result is a punchier attack similar to a compressor effect. This effect is more pronounced with short attack and decay times.

Retrigger

When Retrigger is activated, the envelope re-triggers each time you play a new note. However, with certain textures/pad sounds and a limited number of voices it is recommended to leave the button deactivated, due to click noises that might occur, when the envelope is ended up abruptly. This is caused by the incoming re-trigger that forces the envelope to start over again.

Assigning Envelope modulation destinations

To assign a modulation destination for an Envelope, proceed as follows:

1. Click in the "Mod Dest" box for one of the Envelopes.
A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination, e.g. Filter Cut Off.
The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Select a suitable envelope curve for the modulation.
You should now hear the filter cutoff being modulated by the envelope as you play.

4. Using the same basic method, you can add any number of modulation destinations for the envelope.
They are all listed in the "Mod Dest" box.

- To remove a modulation destination click on its name in the list and select "Off" from the pop-up menu.

Assigning Envelope velocity destinations

You can also assign Envelope modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the "Vel Dest" box for one of the envelopes.
A pop-up menu appears in which all possible velocity destinations are shown.

2. Select a destination.
The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the Envelope.
They are all listed in the "Vel Dest" box.

- To remove a modulation destination click on its name in the list and select "Off" from the pop-up menu.

Envelope modulation velocity control – an example:

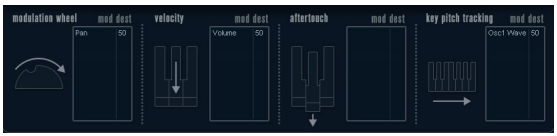
If you follow the steps above and select the filter cutoff parameter as a Velocity destination, the following happens:

- The harder you strike the key, the more the filter cutoff parameter is modulated by the Envelope.

- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the filter cutoff is modulated by the Envelope.

Event page

The Event page is opened by clicking the EVENT button at the top of the lower half of the control panel. This page contains the most common MIDI controllers and their respective assignments.



The following controllers are available:

Controller	Description
Modulation Wheel	The modulation wheel on your keyboard can be used to modulate parameters.
Velocity	Velocity is used to control parameters according to how hard or soft you play notes on your keyboard. A common application of velocity is to make sounds brighter and louder if you strike the key harder.
Aftertouch	Aftertouch, or channel pressure, is MIDI data sent when pressure is applied to a keyboard after the key has been struck, and while it is being held down or sustained. Aftertouch is often routed to control filter cutoff, volume, and other parameters to add expression. Most (but not all) MIDI keyboards send Aftertouch.
Key Pitch Tracking	This can change parameter values linearly according to where on the keyboard you play.

To assign any of these controllers to one or several parameters, proceed as follows:

1. Click in the “Mod Dest” box for one of the controllers.
A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination.
The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount when the controller is at its full range.

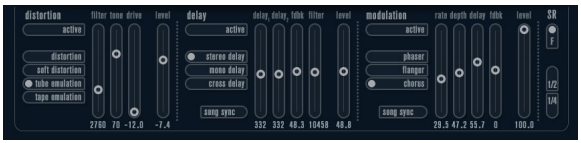
- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of modulation destinations for the controllers.
They are all listed in the “Mod Dest” box for the respective controller.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Effects (EFX) page

This page features three separate effect units: Distortion, Delay and Modulation (Phaser/Flanger/Chorus). The Effect page is opened by clicking the EFX button at the top of the lower half of the control panel.



- Each separate effect section is laid out with a row of buttons that determine the effect type or characteristic and a row of sliders for making parameter settings.

- To activate an effect, click the “Active” button so that a dot appears.
Clicking again deactivates the effect.

Distortion

You can select between 4 basic distortion characteristics:

- Distortion provides hard clipping distortion.
- Soft Distortion provides soft clipping distortion.
- Tape Emulation produces distortion similar to magnetic tape saturation.
- Tube Emulation produces distortion similar to valve amplifiers.

The parameters are as follows:

Parameter	Description
Filter	This parameter sets the crossover frequency of the distortion filter. The distortion filter consists of a low pass filter and a high pass filter with a cutoff frequency equal to the crossover frequency.
Tone	This parameter controls the relative amount of low pass and high-pass filtered signal.
Drive	Sets the amount of distortion by amplifying the input signal.
Level	This controls the output level of the effect.

Delay

You can select between 3 basic delay characteristics:

- Stereo Delay has two separate delay lines panned left and right.
- In Mono Delay the two delay lines are connected in series for monophonic dual tap delay effects.
- In Cross Delay the delayed sound bounces between the stereo channels.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the delay times on or off.
Delay 1	Sets the delay time ranging from 0ms to 728ms. If MIDI sync is activated the range is from 1/32 to 1/1; straight, triplet or dotted.
Delay 2	Same as Delay 1.
Feedback	This controls the decay of the delays. With higher settings the echoes repeat longer.
Filter	A low pass filter is built into the feedback loop of the delay. This parameter controls the cutoff frequency of this feedback filter. Low settings result in successive echoes sounding darker.
Level	This controls the output level of the effect.

Modulation

You can select between 3 basic modulation characteristics:

- The Phaser uses an 8-pole allpass filter to produce the classic phasing effect.
- The Flanger is composed of two independent delay lines with feedback for the left and the right channel respectively. The delay time of both delays is modulated by one LFO with adjustable frequency.
- Chorus produces a rich chorus effect with 4 delays modulated by four independent LFOs.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the Rate parameter on or off.
Rate	Sets the rate of the LFOs modulating the delay time. If Song Sync is activated the rate is synced to various beat increments.
Depth	This parameter controls the depth of the delay time modulation.
Delay	This parameter sets the delay time of the four delay lines.
Feedback	The feedback parameter controls the amount of positive or negative feedback for all four delay lines. The adjustable range is from -1 to 1.
Level	This controls the output level of the effect.

SR parameters

With these buttons you can change the sample rate. Lower sample rates basically reduce the high frequency content and sound quality, but the pitch is not altered. This is a great way to emulate the “lo-fi” sounds of older digital synths!

- If button “F” is active, the selected Part’s program plays back with the sample rate set in the host application.
- If button “1/2” is active, the selected Part’s program plays back with half the original sample rate.
- If button “1/4” is active, the selected Part’s program plays back with a quarter of the original sample rate.

- A bonus effect of using lower sample rates is that it reduces the load on the computer CPU, allowing more simultaneous voices to be played, etc.

Spector

The synthesis in this synthesizer is based around a “spectrum filter”, which allows you to specify the frequency response by drawing a filter contour in the spectrum display. Slightly simplified, the signal path is the following:

- The starting point is the sound generated by up to 6 oscillators.

You can choose between different numbers of oscillators in different configurations (in octaves, in unison, etc.). The oscillators can also be detuned for fat sounds or extreme special effects.

- Each oscillator produces two basic waveforms, labeled A and B.

You can choose between six different waveforms, independently selected for A and B.

- The two waveforms pass through separate spectrum filters (A and B).
You can draw different spectrum contours for the two filters, or select a contour from the included presets.

- The Cut 1 & 2 parameters allow you to shift the frequency range of the spectrum filter.
This makes it easy to create unique-sounding filter sweeps.

- Finally, a Morph control lets you mix the output of spectrum filters A and B.
Since this can be controlled with envelopes, LFOs, etc. you can create morphing effects.

- You also have controllers and modulation parameters (two LFOs, four envelopes and three effects), see "Modulation and controllers" on page 24.

⇨ The signal flow of the Spector synth is illustrated in the section "Diagrams" on page 52.

Sound parameters

Oscillator section

A/B waveform pop-up menus

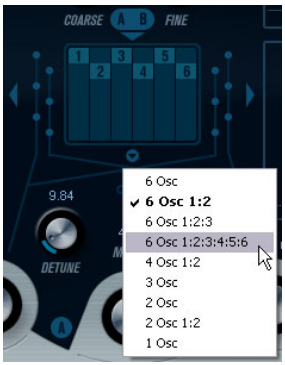
This is where you select basic waveforms for the A and B output of the oscillators. The options are especially suited for use with the spectrum filter.

Coarse and Fine

These parameters provide overall transposition and tuning of the oscillators (common for all oscillators, A and B waveforms).

Oscillator pop-up menu

This pop-up menu is opened by clicking on the arrow below the centrally placed section (which illustrates the currently selected oscillator configuration).



The pop-up menu has the following oscillator configurations to choose between:

Option	Description
6 Osc	6 oscillators with the same pitch.
6 Osc 1:2	3 oscillators with base pitch and 3 pitched one octave down.
6 Osc 1:2:3	Three groups of two oscillators with the pitch ratio 1:2:3 (2 oscillators with base pitch, 2 oscillators at half the frequency of the base pitch and 2 oscillators at a third of the frequency).
6 Osc 1:2:3:4:5:6	6 oscillators tuned with the pitch ratio 1:2:3:4:5:6 (known as the "subharmonic series").
4 Osc 1:2	2 oscillators with base pitch and 2 pitched one octave down.
3 Osc	3 oscillators with the same pitch.
2 Osc	2 oscillators with the same pitch.
2 Osc 1:2	One oscillator with base pitch and one pitched one octave down.
1 Osc	A single oscillator. In this mode, the Detune and Cut II parameters are not active.

Detune

Detunes the oscillators (in all oscillator modes except "1Osc"). Low values give gentle chorus-like detuning; raising the control detunes the oscillators by several semitones for clangorous special effects.

Raster

This parameter reduces the number of harmonics present in the oscillator waveforms in the following manner:

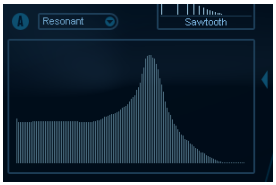
Setting	Description
0	All harmonics present.
1	Only every second harmonic present.
2	Only every third harmonic present.
…	…and so on.

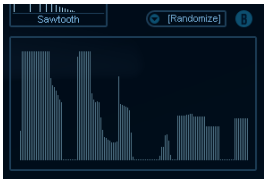
Portamento

This parameter makes the pitch glide between the notes you play. The parameter setting determines the time it takes for the pitch to glide from one note to the next. Turn the knob clockwise for longer glide time.

The “Mode” switch allows you to apply glide only when you play a legato note (when switch is set to Legato). Legato is when you play a note without releasing the previously played note. Note that Legato mode only works with monophonic parts.

Spectrum filter sections





This is where you create the contours (frequency response characteristics) for the two 128 pole resonant spectrum filters “A” and “B”.

- You can use the Preset pop-up menu to select a preset contour if you like.
- To change the contour, click and “draw” with the mouse.

Once you change the selected contour, it is labeled as “Custom” in the Preset field above the display, indicating that you’re no longer using one of the presets.

- If you want to random calculate a spectrum filter curve, you can choose the Randomize function from the Preset pop-up menu.

Each time you choose this function, a new randomized spectrum appears.

Cut I and II

These work much like cutoff frequency controls on a conventional filter: With the Cut controls at the maximum setting, the full frequency range is used for the spectrum filter; lowering the Cut controls gradually moves the entire contour down in frequency, “closing” the filter. Please note the following:

- If a 2 oscillator configuration is used, you can set different “cutoffs” for the two oscillators with Cut I and Cut II, respectively. Similarly, if more than two oscillators are used, they are internally divided in two groups, for which you can set independent “cutoffs” with Cut I and II.

For example, in the “6 Osc” modes Cut I affects the sound of oscillators 1, 3 and 5 while Cut II affects the sound of oscillators 2, 4 and 6. In the “1 Osc” mode, the Cut II control is not used.

- If the Spectrum Sync (link symbol) button between the Cut controls is activated, the two knobs are synced and follow each other and are set to the same value.

Morph

This controls the mix between the sound of spectrum filters A and B. When the Morph knob is turned fully left, only the “A” sound is heard; when it is turned right only the “B” sound is heard. This allows you to seamlessly morph (manually or using an LFO or an envelope) between two totally different sounds.

Master Volume and Pan

The master Volume controls the master volume (amplitude) of the instrument. By default this parameter is controlled by Envelope 1, to generate an amplitude envelope for the oscillators.

The Pan knob controls the position in the stereo spectrum for the instrument. You can use Pan as a modulation destination.

Modulation and controllers

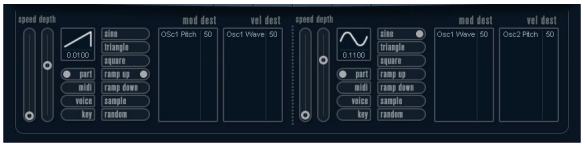
The lower half of the control panel displays the various modulation and controller assignment pages available as well as the effect page. You switch between these pages using the buttons below the Morph section.

The following pages are available:

- The LFO page has two low frequency oscillators (LFOs) for modulating parameters – see below.
- The Envelope page contains the four Envelope generators which can be assigned to control parameters – see "Envelope page" on page 26.
- The Event page contains the common MIDI controllers (Mod wheel, Aftertouch, etc.) and their assignments – see "Event page" on page 27.
- The Effect page has three separate effect types available; Distortion, Delay, and Modulation – see "Effects (EFX) page" on page 28.

LFO page

The LFO page is opened by clicking the LFO button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for two independent LFOs.



Depending on the currently selected preset, there may already be modulation destinations assigned, in which case these are listed in the "Mod Dest" box for each LFO – see "Assigning LFO modulation destinations" on page 25. A low frequency oscillator (LFO) is used for modulating parameters, for example the pitch of an oscillator (to produce vibrato), or for any parameter where cyclic modulation is desired.

The two LFOs have identical parameters:

Parameter	Description
Speed	This governs the rate of the LFO. If MIDI Sync is activated (see below), the available rate values are selectable as note values, so the rate is synced to the sequencer tempo in Nuendo in various beat increments.
Depth	This controls the amount of modulation applied by the LFO. If set to zero, no modulation is applied.
Waveform	This sets the LFO waveform.
Sync mode (Part/MIDI/ Voice/Key)	This sets the sync mode for the LFO. See below for a description.

About the sync modes

The Sync modes determine how the LFO cycle affects the notes you play:

Parameter	Description
Part	In this mode, the LFO cycle is free running and affects all the voices in sync. "Free running" means that the LFO cycles continuously, and does not reset when a note is played.
MIDI	In this mode the LFO rate is synced in various beat increments to MIDI clock.

Parameter	Description
Voice	In this mode each voice in the Part has its own independent LFO cycle (the LFO is polyphonic). These cycles are also free running – each key down starts anywhere in the LFO cycle phase.
Key	Same as Voice except that it is not free running – for each key down the LFO cycle starts over.

About the waveforms

Most standard LFO waveforms are available for LFO modulation. You use Sine and Triangle waveforms for smooth modulation cycles, Square and Ramp up/down for different types of stepped modulation cycles and Random or Sample for random modulation. The Sample waveform is different:

- In this mode, the LFO actually makes use of the other LFO as well.

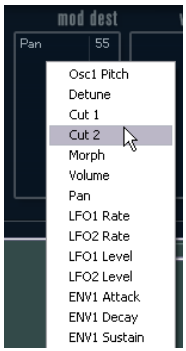
For example, if LFO 2 is set to use Sample the resulting effect also depends on the speed and waveform of LFO 1.

Assigning LFO modulation destinations

To assign a modulation destination for an LFO, proceed as follows:

1. Click in the “Mod Dest” box for one of the LFOs.

A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.



2. Select a destination, e.g. Cut.

The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Select a suitable LFO Waveform, Speed, Depth, and Sync mode.

You should now hear the Cut parameter being modulated by the LFO.

4. Using the same basic method, you can add any number of modulation destinations for the LFO.

They are all listed in the “Mod Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Assigning LFO velocity destinations

You can also assign LFO modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the “Vel Dest” box for one of the LFOs.

A pop-up menu appears in which all possible velocity destinations are shown.

2. Select a destination.

The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the LFO.

They are all listed in the “Vel Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

LFO modulation velocity control – an example:

If you follow the steps above and select the Cut parameter as a Velocity destination, the following happens:

- The harder you strike the key, the more the Cut parameter is modulated by the LFO.
- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the Cut parameter is modulated by the LFO.

Envelope page

The Envelope page is opened by clicking the ENV button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for the four independent envelope generators.

Envelope generators govern how a parameter value changes when a key is pressed, when a key is held and finally when a key is released.

On the Envelope page, the parameters for one of the four envelope generators is shown at a time.

- You switch between the four envelopes in the section to the left.

Clicking on either of the four mini curve displays 1 to 4 selects it and displays the corresponding envelope parameters to the right. The mini curve displays also reflect the envelope settings for each corresponding envelope.

- Envelope generators have four parameters; Attack, Decay, Sustain, and Release (ADSR).

See below for a description of these.

- You can set envelope parameters in two ways; either by using the sliders or by click-dragging the curve in the Envelope curve display.

You can also do this in the mini curve displays.

- By default Envelope 1 is assigned to the master volume, and therefore acts as an amplitude envelope. The amplitude envelope is used to adjust how the volume of the sound changes from the time you press a key until the key is released.

If no amplitude envelope were assigned, there would be no output.

The Envelope parameters are as follows:

Attack

The attack phase is the time it takes from zero to the maximum value. How long this takes is governed by the Attack setting. If the Attack is set to “0”, the maximum value is reached instantly. If this value is raised, it takes time before the maximum value is reached. Range is from 0.0 milliseconds to 91.1 seconds.

Decay

After the maximum value has been reached, the value starts to drop. How long this takes is governed by the Decay time parameter. The Decay time has no effect if the Sustain parameter is set to maximum. Range is from 0.0 milliseconds to 91.1 seconds.

Sustain

The Sustain parameter determines the level the envelope rests at after the Decay phase. Note that Sustain represents a level, whereas the other envelope parameters represent times. Range is from 0 to 100.

Release

Release determines the time it takes for the value to fall back to zero after releasing the key. Range is from 0.0 milliseconds to 91.1 seconds.

Punch

When Punch is activated, the start of the decay phase is delayed a few milliseconds (the envelope “stays” at top level for a moment before moving on to the decay phase). The result is a punchier attack similar to a compressor effect. This effect is more pronounced with short attack and decay times.

Retrigger

When Retrigger is activated, the envelope re-triggers each time you play a new note. However, with certain textures/pad sounds and a limited number of voices it is recommended to leave the button deactivated, due to click noises that might occur, when the envelope is ended up abruptly. This is caused by the incoming re-trigger that forces the envelope to start over again.

Assigning Envelope modulation destinations

To assign a modulation destination for an Envelope, proceed as follows:

1. Click in the “Mod Dest” box for one of the Envelopes.

A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination, e.g. Cut.

The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

▪ You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Select a suitable envelope curve for the modulation.
You should now hear the Cut parameter being modulated by the envelope as you play.

4. Using the same basic method, you can add any number of modulation destinations for the envelope.
They are all listed in the "Mod Dest" box.

▪ To remove a modulation destination click on its name in the list and select "Off" from the pop-up menu.

Assigning Envelope velocity destinations

You can also assign Envelope modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the "Vel Dest" box for one of the envelopes.
A pop-up menu appears in which all possible velocity destinations are shown.

2. Select a destination.
The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

▪ You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the Envelope.
They are all listed in the "Vel Dest" box.

▪ To remove a modulation destination click on its name in the list and select "Off" from the pop-up menu.

Envelope modulation velocity control – an example:

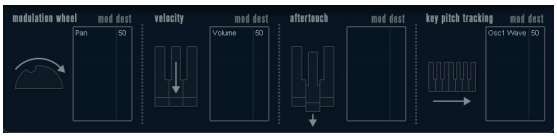
If you follow the steps above and select the Cut parameter as a Velocity destination, the following happens:

▪ The harder you strike the key, the more the parameter is modulated by the Envelope.

▪ If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the Cut parameter is modulated by the Envelope.

Event page

The Event page is opened by clicking the EVENT button at the top of the lower half of the control panel. This page contains the most common MIDI controllers and their respective assignments.



The following controllers are available:

Controller	Description
Modulation Wheel	The modulation wheel on your keyboard can be used to modulate parameters.
Velocity	Velocity is used to control parameters according to how hard or soft you play notes on your keyboard. A common application of velocity is to make sounds brighter and louder if you strike the key harder.
Aftertouch	Aftertouch, or channel pressure, is MIDI data sent when pressure is applied to a keyboard after the key has been struck, and while it is being held down or sustained. Aftertouch is often routed to control filter cutoff, volume, and other parameters to add expression. Most (but not all) MIDI keyboards send Aftertouch.
Key Pitch Tracking	This can change parameter values linearly according to where on the keyboard you play.

To assign any of these controllers to one or several parameters, proceed as follows:

1. Click in the "Mod Dest" box for one of the controllers.
A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination.
The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount when the controller is at its full range.

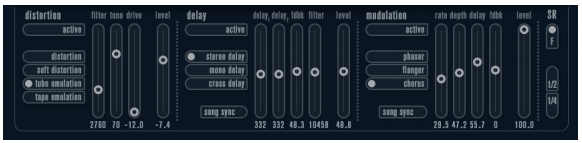
▪ You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of modulation destinations for the controllers.
They are all listed in the "Mod Dest" box for the respective controller.

▪ To remove a modulation destination click on its name in the list and select "Off" from the pop-up menu.

Effects (EFX) page

This page features three separate effect units: Distortion, Delay and Modulation (Phaser/Flanger/Chorus). The Effect page is opened by clicking the EFX button at the top of the lower half of the control panel.



- Each separate effect section is laid out with a row of buttons that determine the effect type or characteristic and a row of sliders for making parameter settings.

- To activate an effect, click the “Active” button so that a dot appears.

Clicking again deactivates the effect.

Distortion

You can select between 4 basic distortion characteristics:

- Distortion provides hard clipping distortion.
- Soft Distortion provides soft clipping distortion.
- Tape Emulation produces distortion similar to magnetic tape saturation.
- Tube Emulation produces distortion similar to valve amplifiers.

The parameters are as follows:

Parameter	Description
Filter	This parameter sets the crossover frequency of the distortion filter. The distortion filter consists of a low pass filter and a high pass filter with a cutoff frequency equal to the crossover frequency.
Tone	This parameter controls the relative amount of low pass and high-pass filtered signal.
Drive	Sets the amount of distortion by amplifying the input signal.
Level	This controls the output level of the effect.

Delay

You can select between 3 basic delay characteristics:

- Stereo Delay has two separate delay lines panned left and right.
- In Mono Delay the two delay lines are connected in series for monophonic dual tap delay effects.
- In Cross Delay the delayed sound bounces between the stereo channels.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the delay times on or off.
Delay 1	Sets the delay time ranging from 0ms to 728ms. If MIDI sync is activated the range is from 1/32 to 1/1; straight, triplet or dotted.
Delay 2	Same as Delay 1.
Feedback	This controls the decay of the delays. With higher settings the echoes repeat longer.
Filter	A low pass filter is built into the feedback loop of the delay. This parameter controls the cutoff frequency of this feedback filter. Low settings result in successive echoes sounding darker.
Level	This controls the output level of the effect.

Modulation

You can select between 3 basic modulation characteristics:

- The Phaser uses an 8-pole allpass filter to produce the classic phasing effect.
- The Flanger is composed of two independent delay lines with feedback for the left and the right channel respectively. The delay time of both delays is modulated by one LFO with adjustable frequency.
- Chorus produces a rich chorus effect with 4 delays modulated by four independent LFOs.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the Rate parameter on or off.
Rate	Sets the rate of the LFOs modulating the delay time. If Song Sync is activated the rate is synced to various beat increments.
Depth	This parameter controls the depth of the delay time modulation.
Delay	This parameter sets the delay time of the four delay lines.
Feedback	The feedback parameter controls the amount of positive or negative feedback for all four delay lines. The adjustable range is from -1 to 1.
Level	This controls the output level of the effect.

SR parameters

With these buttons you can change the sample rate. Lower sample rates basically reduce the high frequency content and sound quality, but the pitch is not altered. This is a great way to emulate the “lo-fi” sounds of older digital synths!

- If button “F” is active, the selected Part’s program plays back with the sample rate set in the host application.
- If button “1/2” is active, the selected Part’s program plays back with half the original sample rate.
- If button “1/4” is active, the selected Part’s program plays back with a quarter of the original sample rate.

- A bonus effect of using lower sample rates is that it reduces the load on the computer CPU, allowing more simultaneous voices to be played, etc.

Mystic

The synthesis method used by Mystic is based on three parallel comb filters with feedback. A comb filter is a filter with a number of “notches” in its frequency response, with the notch frequencies harmonically related to the frequency of the fundamental (lowest) notch.

A typical example of comb filtering occurs if you are using a flanger effect or a delay effect with very short delay time. As you probably know, raising the feedback (the amount of signal sent back into the delay or flanger) causes a resonating tone – this tone is basically what the Mystic produces. This astonishingly simple synthesis method is capable of generating a wide range of sounds, from gentle plucked-string tones to weird, non-harmonic timbres.

The basic principle is the following:

- You start with an “impulse sound”, typically with a very short decay.
  The spectrum of the impulse sound largely affects the tonal quality of the final sound. To set up an impulse sound on the Mystic you use a slightly simplified version of the synthesis found on the Spector synth.

- The impulse sound is fed into the three comb filters, in parallel. Each of these has a feedback loop.
  This means the output of each comb filter is fed back into the filter. This results in a resonating feedback tone.

- When the signal is fed back into the comb filter, it goes via a separate, variable low pass filter.
  This filter corresponds to the damping of high frequencies in a physical instrument – when set to a low cutoff frequency it causes high harmonics to decay faster than the lower harmonics (as when plucking a string on a guitar, for example).

- The level of the feedback signal is governed by a feedback control.
  This determines the decay of the feedback tone. Setting this to a negative value simulates the traveling wave in a tube with one open end and one closed end. The result is a more hollow, square wave-like sound, pitched one octave lower.

- A detune control offsets the fundamental frequencies of the three comb filters, for chorus-like sounds or drastic special effects.

Finally you have access to the common synth parameters – two LFOs, four envelopes and an effect section.

- By default, envelope 2 controls the level of the impulse sound – this is where you set up the short impulse decay when emulating string sounds, etc.

⇨ The signal flow of the Mystic synth is illustrated in the section “Diagrams” on page 52.

Sound parameters

The Impulse Control section

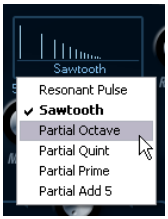
This is where you set up the impulse sound – the sound fed into the comb filters, serving as a starting point for the sound. The Impulse Control has two basic waveforms that are filtered through separate spectrum filters with adjustable base frequency; the output is an adjustable mix between the two waveform/spectrum filter signals.

Spectrum displays

The displays allow you to draw a filter contour with your mouse for spectrum filters A & B.

- To set up the contour, click in one of the displays and drag the mouse to draw the desired curve. Note that this produces the inverse contour in the other display, for maximum sonic versatility.
  To set up the contour independently for the two filters, hold down [Shift] and click and drag the mouse in either display.
- Use the Preset pop-up menu to select a preset contour if you like.
- If you want to random calculate a spectrum filter curve, you can choose the Randomize function from the Preset pop-up menu.
  Each time you choose this function, a new randomized spectrum appears.

Waveform pop-up menu



The pop-up menu at the bottom of the waveform section (the central box at the top of the panel) allows you to select a basic waveform to be sent through filter contour A. The options are especially suited for use with the spectrum filter.

Cut

This offsets the frequency of the filter contour, working somewhat like a cutoff control on a standard synth filter. To use the filter contour in its full frequency range, set Cut to its maximum value.

Morph

Adjusts the mix between the two signal paths: waveform A spectrum contour A and waveform B spectrum contour B.

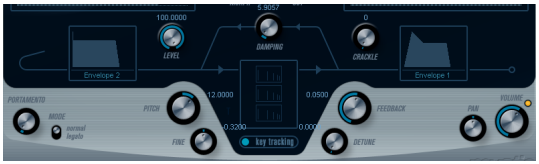
Coarse

This offsets the pitch for the impulse sound. In a typical “string setup”, when the impulse sound is very short, this does not change the pitch of the final sound, but the tonal color.

Raster

This removes harmonics from the impulse sound. As the harmonic content of the impulse sound is reflected in the comb filter sound, this changes the final timbre.

Comb filter sound parameters



Damping

This is a 6dB/oct low pass filter that affects the sound being fed back into the comb filters. This means the sound becomes gradually softer when decaying, i.e. high harmonics to decay faster than the lower harmonics (as when plucking a string on a guitar, for example).

- The lower the Damping, the more pronounced this effect.

If you open the filter completely (turn Damping up to max) the harmonic content is static – i.e. the sound does not get softer when decaying.

Level

This determines the level of the impulse sound being fed into the comb filters. By default, this parameter is modulated by envelope 2. That is, you use envelope 2 as a level envelope for the impulse sound.

- For a string-type sound, you want an envelope with a quick attack, a very short decay and no sustain (an “impulse” in other words), but you can also use other envelopes for other types of sounds.

Try raising the attack for example, or raising the sustain to allow the impulse sound to be heard together with the comb filter sound.

Crackle

This allows you to send noise directly into the comb filters. Small amounts of noise produce a “crackling”, erratic effect; higher amounts give a more pronounced noise sound.

Feedback

This determines the amount of signal sent back into the comb filters (the feedback level).

- Setting Feedback to zero (twelve o’clock) effectively turns off the comb filter sound, as no feedback tone is produced.
- Setting Feedback to a positive value creates a feedback tone, with higher settings generating longer decays.
- Setting Feedback to a negative value creates a feedback tone with a more hollow sound, pitched one octave lower. Lower settings generate longer decays.

Detune

This offsets the notch frequencies of the three parallel comb filters, effectively changing the pitches of their feedback tones. At low settings, this creates a chorus-like detune effect. Higher settings detunes the three tones in wider intervals.

Pitch and Fine

Overall pitch adjustment of the final sound. This changes the pitch of both the impulse sound and the final comb filter sound.

Key Tracking

This button determines whether the impulse sound should track the keyboard or not. This affects the sound of the comb filters in a way similar to a key track switch on a regular subtractive synth filter.

Portamento

This parameter makes the pitch glide between the notes you play. The parameter setting determines the time it takes for the pitch to glide from one note to the next. Turn the knob clockwise for longer glide time.

The “Mode” switch allows you to apply glide only when you play a legato note (when switch is set to Legato). Legato is when you play a note without releasing the previously played note. Note that Legato mode only works with monophonic parts.

Master Volume and Pan

The master Volume controls the master volume (amplitude) of the instrument. By default this parameter is controlled by Envelope 1, to generate an amplitude envelope for the oscillators.

The Pan knob controls the position in the stereo spectrum for the instrument. You can use Pan as a modulation destination.

Modulation and controllers

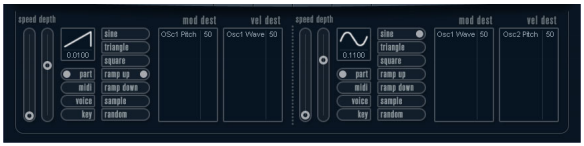
The lower half of the control panel displays the various modulation and controller assignment pages available as well as the effect page. You switch between these pages using the buttons above this section.

The following pages are available:

- The LFO page has two low frequency oscillators (LFOs) for modulating parameters – see below.
- The Envelope page contains the four Envelope generators which can be assigned to control parameters – see “Envelope page” on page 34.
- The Event page contains the common MIDI controllers (Mod wheel, Aftertouch, etc. and their assignments – see “Event page” on page 35.
- The Effect page has three separate effect types available; Distortion, Delay and Modulation – see “Effects (EFX) page” on page 36.

LFO page

The LFO page is opened by clicking the LFO button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for two independent LFOs.



Depending on the currently selected preset, there may already be modulation destinations assigned, in which case these are listed in the “Mod Dest” box for each LFO – see “Assigning LFO modulation destinations” on page 33.

A low frequency oscillator (LFO) is used for modulating parameters, for example the pitch of an oscillator (to produce vibrato), or for any parameter where cyclic modulation is desired.

The two LFOs have identical parameters:

Parameter	Description
Speed	This governs the rate of the LFO. If MIDI Sync is activated (see below), the available rate values are selectable as note values, so the rate is synced to the sequencer tempo in Nuendo in various beat increments.
Depth	This controls the amount of modulation applied by the LFO. If set to zero, no modulation is applied.
Waveform	This sets the LFO waveform.
Sync mode (Part/MIDI/ Voice/Key)	This sets the sync mode for the LFO. See below for a description.

About the sync modes

The Sync modes determine how the LFO cycle affects the notes you play:

Parameter	Description
Part	In this mode, the LFO cycle is free running and affects all the voices in sync. “Free running” means that the LFO cycles continuously, and does not reset when a note is played.
MIDI	In this mode the LFO rate is synced in various beat increments to MIDI clock.
Voice	In this mode each voice in the Part has its own independent LFO cycle (the LFO is polyphonic). These cycles are also free running – each key down starts anywhere in the LFO cycle phase.
Key	Same as Voice except that it is not free running – for each key down the LFO cycle starts over.

About the waveforms

Most standard LFO waveforms are available for LFO modulation. You use Sine and Triangle waveforms for smooth modulation cycles, Square and Ramp up/down for different types of stepped modulation cycles and Random or Sample for random modulation. The Sample waveform is different:

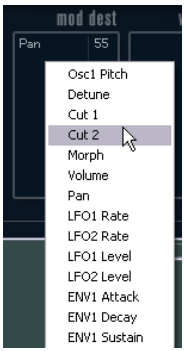
- In this mode, the LFO actually makes use of the other LFO as well.

For example, if LFO 2 is set to use Sample the resulting effect also depends on the speed and waveform of LFO 1.

Assigning LFO modulation destinations

To assign a modulation destination for an LFO, proceed as follows:

1. Click in the “Mod Dest” box for one of the LFOs.
A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.



2. Select a destination, e.g. Cut.
The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Select a suitable LFO Waveform, Speed, Depth, and Sync mode.
You should now hear the Cut parameter being modulated by the LFO.

4. Using the same basic method, you can add any number of modulation destinations for the LFO.
They are all listed in the “Mod Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Assigning LFO velocity destinations

You can also assign LFO modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the “Vel Dest” box for one of the LFOs.
A pop-up menu appears in which all possible velocity destinations are shown.

2. Select a destination.
The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the LFO.
They are all listed in the “Vel Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

LFO modulation velocity control – an example:

If you follow the steps above and select the Cut parameter as a Velocity destination, the following happens:

- The harder you strike the key, the more the Cut parameter is modulated by the LFO.

- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the Cut parameter is modulated by the LFO.

Envelope page

The Envelope page is opened by clicking the ENV button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for the four independent envelope generators.

Envelope generators govern how a parameter value changes when a key is pressed, when a key is held and finally when a key is released.

On the Envelope page, the parameters for one of the four envelope generators is shown at a time.

- You switch between the four envelopes in the section to the left.

  Clicking on either of the four mini curve displays 1 to 4 selects it and displays the corresponding envelope parameters to the right. The mini curve displays also reflect the envelope settings for each corresponding envelope.

- Envelope generators have four parameters; Attack, Decay, Sustain, and Release (ADSR).

  See below for a description of these.

- You can set envelope parameters in two ways; either by using the sliders or by click-dragging the curve in the Envelope curve display.

  You can also do this in the mini curve displays.

- By default Envelope 1 is assigned to the master volume, and therefore acts as an amplitude envelope. The amplitude envelope is used to adjust how the volume of the sound changes from the time you press a key until the key is released.

  If no amplitude envelope were assigned, there would be no output.

- Envelope 2 is by default assigned to the Level parameter.

  See “Level” on page 31.

The Envelope parameters are as follows:

Attack

The attack phase is the time it takes from zero to the maximum value. How long this takes is governed by the Attack setting. If the Attack is set to “0”, the maximum value is reached instantly. If this value is raised, it takes time before the maximum value is reached. Range is from 0.0 milliseconds to 91.1 seconds.

Decay

After the maximum value has been reached, the value starts to drop. How long this takes is governed by the Decay time parameter. The Decay time has no effect if the Sustain parameter is set to maximum. Range is from 0.0 milliseconds to 91.1 seconds.

Sustain

The Sustain parameter determines the level the envelope rests at after the Decay phase. Note that Sustain represents a level, whereas the other envelope parameters represent times. Range is from 0 to 100.

Release

Release determines the time it takes for the value to fall back to zero after releasing the key. Range is from 0.0 milliseconds to 91.1 seconds.

Punch

When Punch is activated, the start of the decay phase is delayed a few milliseconds (the envelope “stays” at top level for a moment before moving on to the decay phase). The result is a punchier attack similar to a compressor effect. This effect is more pronounced with short attack and decay times.

Retrigger

When Retrigger is activated, the envelope re-triggers each time you play a new note. However, with certain textures/pad sounds and a limited number of voices it is recommended to leave the button deactivated, due to click noises that might occur, when the envelope is ended up abruptly. This is caused by the incoming re-trigger that forces the envelope to start over again.

Assigning Envelope modulation destinations

To assign a modulation destination for an Envelope, proceed as follows:

1. Click in the “Mod Dest” box for one of the Envelopes.
A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination, e.g. Cut.
The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Select a suitable envelope curve for the modulation.
You should now hear the Cut parameter being modulated by the envelope as you play.

4. Using the same basic method, you can add any number of modulation destinations for the envelope.
They are all listed in the “Mod Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Assigning Envelope velocity destinations

You can also assign Envelope modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the “Vel Dest” box for one of the envelopes.
A pop-up menu appears in which all possible velocity destinations are shown.

2. Select a destination.
The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the Envelope.
They are all listed in the “Vel Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Envelope modulation velocity control – an example:

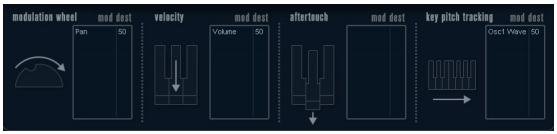
If you follow the steps above and select the Cut parameter as a Velocity destination, the following happens:

- The harder you strike the key, the more the parameter is modulated by the Envelope.

- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the Cut parameter is modulated by the Envelope.

Event page

The Event page is opened by clicking the EVENT button at the top of the lower half of the control panel. This page contains the most common MIDI controllers and their respective assignments.



The following controllers are available:

Controller	Description
Modulation Wheel	The modulation wheel on your keyboard can be used to modulate parameters.
Velocity	Velocity is used to control parameters according to how hard or soft you play notes on your keyboard. A common application of velocity is to make sounds brighter and louder if you strike the key harder.
Aftertouch	Aftertouch, or channel pressure, is MIDI data sent when pressure is applied to a keyboard after the key has been struck, and while it is being held down or sustained. Aftertouch is often routed to control filter cutoff, volume, and other parameters to add expression. Most (but not all) MIDI keyboards send Aftertouch.
Key Pitch Tracking	This can change parameter values linearly according to where on the keyboard you play.

To assign any of these controllers to one or several parameters, proceed as follows:

1. Click in the “Mod Dest” box for one of the controllers.
A pop-up menu appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination.
The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount when the controller is at its full range.

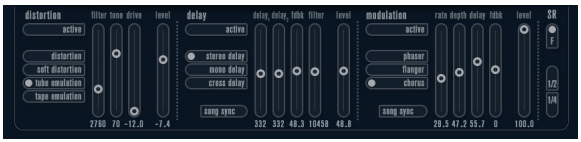
- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of modulation destinations for the controllers.
They are all listed in the “Mod Dest” box for the respective controller.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up menu.

Effects (EFX) page

This page features three separate effect units: Distortion, Delay and Modulation (Phaser/Flanger/Chorus). The Effect page is opened by clicking the EFX button at the top of the lower half of the control panel.



- Each separate effect section is laid out with a row of buttons that determine the effect type or characteristic and a row of sliders for making parameter settings.

- To activate an effect, click the “Active” button so that a dot appears.
Clicking again deactivates the effect.

Distortion

You can select between 4 basic distortion characteristics:

- Distortion provides hard clipping distortion.
- Soft Distortion provides soft clipping distortion.
- Tape Emulation produces distortion similar to magnetic tape saturation.
- Tube Emulation produces distortion similar to valve amplifiers.

The parameters are as follows:

Parameter	Description
Drive	Sets the amount of distortion by amplifying the input signal.
Filter	This parameter sets the crossover frequency of the distortion filter. The distortion filter consists of a low pass filter and a high pass filter with a cutoff frequency equal to the crossover frequency.
Tone	This parameter controls the relative amount of low-pass and high-pass filtered signal.
Level	This controls the output level of the effect.

Delay

You can select between 3 basic delay characteristics:

- Stereo Delay has two separate delay lines panned left and right.
- In Mono Delay the two delay lines are connected in series for monophonic dual tap delay effects.
- In Cross Delay the delayed sound bounces between the stereo channels.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the delay times on or off.
Delay 1	Sets the delay time ranging from 0 ms to 728 ms. If MIDI sync is activated the range is from 1/32 to 1/1; straight, triplet or dotted.
Delay 2	Same as Delay 1.
Feedback	This controls the decay of the delays. With higher settings the echoes repeat longer.
Filter	A low pass filter is built into the feedback loop of the delay. This parameter controls the cutoff frequency of this feedback filter. Low settings result in successive echoes sounding darker.
Level	This controls the output level of the effect.

Modulation

You can select between 3 basic modulation characteristics:

- The Phaser uses an 8-pole allpass filter to produce the classic phasing effect.
- The Flanger is composed of two independent delay lines with feedback for the left and the right channel respectively. The delay time of both delays is modulated by one LFO with adjustable frequency.
- Chorus produces a rich chorus effect with 4 delays modulated by four independent LFOs.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the Rate parameter on or off.
Rate	Sets the rate of the LFOs modulating the delay time. If Song Sync is activated the rate is synced to various beat increments.
Depth	This parameter controls the depth of the delay time modulation.
Delay	This parameter sets the delay time of the four delay lines.
Feedback	The feedback parameter controls the amount of positive or negative feedback for all four delay lines. The adjustable range is from -1 to 1.
Level	This controls the output level of the effect.

SR parameters

With these buttons you can change the sample rate. Lower sample rates basically reduce the high frequency content and sound quality, but the pitch is not altered. This is a great way to emulate the “lo-fi” sounds of older digital synths!

- If button “F” is active, the selected Part’s program plays back with the sample rate set in the host application.
- If button “1/2” is active, the selected Part’s program plays back with half the original sample rate.
- If button “1/4” is active, the selected Part’s program plays back with a quarter of the original sample rate.
- A bonus effect of using lower sample rates is that it reduces the load on the computer CPU, allowing more simultaneous voices to be played, etc.

HALionOne

HALionOne is a sample player that can play sound content in the HSB (HALion Sound Bank) format. These samples have associated preset files that store the panel settings and reference the HSB samples. Included are several presets (as *.vstpreset and *.trackpreset files).

The operation of HALionOne is very simple; load a preset (a *.vstpreset or a *.trackpreset file for an instrument track) and start playing! However, you do have the option to tweak the basic parameters to tailor the sound to your liking.

HALionOne parameters

HALionOne differs from other VST instruments in that the panel parameters shown can vary according to which parameters are stored in the HSB file. HSB files cannot be created with HALionOne, and HALionOne reads only the HSB files supplied with Nuendo. In these files, certain parameters are assigned as part of the file and the associated program (or preset). This means that for each preset, only these assigned parameters are shown on the instrument panel. Typically, these are filter cutoff, DCA and DCF parameters and any assigned effect parameters (the effects are “built in”).

If you load HALionOne for an instrument track and select, for example, the “Draw Organ” preset, the following parameters are shown:

Parameter	Description
Cutoff	This allows you to adjust filter frequency or cutoff. The filter used is a Waldorf Low Pass filter with a 24 dB slope.
Resonance	Raising the filter resonance value emphasizes the frequencies around the set filter frequency.
DCF Amount	Controls the amount of the DCF (filter) envelope.
DCA Attack	Controls the time it takes for the DCA signal to reach its highest level.
DCA Decay	Controls the time it takes the DCA signal to decay to the sustain level.

Parameter	Description
DCA Sustain	Controls the DCA signal level after the Decay phase, as long as you press the key on your MIDI keyboard.
DCA Release	Controls the DCA signal after a key is released.
DCA Amount	Controls the amount of the DCA (amplifier) envelope.

These parameter assignments are used for many of the HALionOne presets, but not for all. As stated above, other parameters may be shown; these are clearly labeled on the panel. For most of the presets there are also associated effects – the effect parameters are usually assigned to the quick controls on the right and typically control the dry/wet mix of the effect.

Effects Usage

This button, located at the bottom right in the box displaying the preset name, allows you to bypass any effects. The LED beside the button is lit if any effects are used in the preset.

Efficiency slider

The Efficiency slider provides a way of balancing audio quality vs. conservation of computer power. The lower the setting, the more voices are available. As a trade-off, sound quality is reduced.

Voices allocated

The Voices field dynamically displays the number of voices currently used.

MIDI and Disk activity LEDs

The MIDI activity LED indicates received MIDI input. The Disk LED lights up green when samples are streamed from disk, and red when samples cannot be loaded from disk in time. In such a case you consider lowering the Efficiency slider. When the disk LED does not light up, samples are read from memory.

Locate Contents

If you have moved the HALionOne content files to a different location (i.e. any other location than the folder in which it was stored at installation time), you need to use the Locate Contents function to inform HALion One about where to find its files. This is done as follows:

- Right-click anywhere on the control panel and select “Locate contents”.

A file dialog opens where you can navigate to the folder location.

HALionOne and MIDI files

When the “Import to Instrument Tracks” option is activated in the Preferences dialog (MIDI–MIDI File page), importing a MIDI file into Nuendo automatically sets up instrument tracks, with HALionOne as the associated instrument. This allows you to quickly audition any imported MIDI files, to change parameter settings or to add effects, etc.

Groove Agent ONE

Groove Agent ONE is an easy-to-use sample-based MPC-style virtual drum machine for creating beats and reconstructing loops.

Audio samples can be associated with the Groove Agent ONE pads. Each pad is associated with a MIDI pitch, allowing you to trigger individual pads via MIDI notes.

To facilitate the creation of your own drum patterns, Groove Agent ONE provides a number of advanced functions.

Groups and pads

The pads and all functions related to the associating and auditioning of sounds can be found in the right half of the Groove Agent ONE panel.

Groove Agent ONE provides up to 128 pads, organized in eight groups of 16 pads. You can switch between the different groups by clicking on the corresponding group buttons (labeled 1 to 8) above the pads. Each pad is mapped to a particular MIDI note (C-2 to G8, which equals 128 notes).

- The button of the active group is highlighted. If one or more pads of a group have samples mapped to them, an additional red frame is displayed around group buttons.
By default, group 3 is active when you open Groove Agent ONE.

Pad functions

- The pads show the associated MIDI note in the top right corner.
You can change the MIDI note by right-clicking it and selecting a different note from the pop-up menu.

- You can assign up to eight samples to a pad.
See "Drag & drop of audio material" on page 39.

- If one or more samples have been assigned to a pad, the name of the first of these samples is displayed at the bottom of the pad.
To change the name, right-click it, enter a new name and press [Enter]. This allows you, e.g., to indicate that more than one sample is mapped to this pad.

- To remove a sample assignment, click on the pad and drag the associated sample(s) to the trash icon in the LCD display to the left (see "Editing sounds" on page 41).
Note that the trash icon is found only on either the Voice, Filter or Amplifier pages.

- The pad status is indicated by different colors.
During playback, a pad lights up yellow for as long as a sample mapped to this pad is played back. When either the Voice, Filter or Amplifier button is activated in the Pad Edit section and you click on a pad, it turns green to indicate that it is selected for editing. Unselected pads not playing back any samples are gray.

- You can mute a pad by [Shift]-clicking it.
A prohibition symbol is displayed on the muted pad. To unmute, [Shift]-click once more.

- You can drag a sample from one pad to another pad.
If the second pad already has a sample mapped to it, the sample assignment is swapped. Note that you can also swap the MIDI notes of the two pads by pressing [Shift] when dropping the sample.

- You can drag and drop samples between groups.
Click on a pad that has a sample mapped to it, keep the mouse button pressed and move the mouse pointer over the button of another group. When the pad display now changes to display the pads of the other group, drag and drop the sample on the desired pad.

Velocity

- The velocity is determined by where on the pad you click: it is lowest at the bottom of the pad and highest at the top.

- You can force all pads to a velocity value of 127 by activating the V-Max button in the Global section in the top right corner of the Groove Agent ONE panel.

Resetting pads

You can find a Reset button in the Global section in the top right corner of the Groove Agent ONE panel. It allows you to clear all pad assignments of the current instance of Groove Agent ONE.

As a safety precaution, the Reset button is locked by default. Clicking the Reset button when it is locked has no effect.

To unlock the Reset button, hold down the [Shift] key while clicking. The button color changes to red. When you click Reset now, all pad assignments are reset.

⚠ The Reset button is re-locked automatically five seconds after unlocking it.

Drag & drop of audio material

Groove Agent ONE provides advanced drag & drop support. You can drag one or more samples at the same time from Nuendo onto Groove Agent ONE. Samples are either be mapped to the same pad, or to different pads.

You can drag files to Groove Agent ONE from the following Nuendo locations:

- MediaBay
- Project window
- Pool
- Sample Editor (regions)
- Audio Part Editor

Layering samples on the same pad

When you select between one and eight samples and drag them to Groove Agent ONE, dropping them onto a pad (or onto the Layer indicator – see below) automatically creates a corresponding number of layers for this pad.

Drag & drop to several pads

Rather than dropping several samples to the same pad, you can also let Groove Agent ONE distribute samples across the available pads in one or several groups. To do so, select the desired samples, drag them to the Groove Agent ONE window, press [Shift] and drop the samples onto a pad. The samples are mapped to the available pads, starting with the pad on which you initially dropped the samples, and then upwards according to the MIDI pitches of the pads.

How many samples can be dropped to several pads depends on the number of pads available in your current instance of Groove Agent ONE. If Groove Agent ONE cannot supply a sufficient number of free pads for the number of dropped samples, a dialog is displayed in which you can confirm or cancel the operation.

Replacing individual samples

To replace a sample mapped to one pad with another sample, proceed as follows:

- Drag the new sample to the pad, press [Alt]/[Option] and drop it.

To replace a sample in a pad layer with another sample, proceed as follows:

- Drag the new sample to the Layer indicator, press [Alt]/[Option] and drop it onto the required layer.

Slicing a loop and triggering individual sounds via MIDI

Drag & drop to several pads has a number of uses. For example, it allows you to trigger individual sounds from an audio loop via MIDI. Proceed as follows:

1. Slice up a drum loop using the Sample Editor. Open the resulting audio part in the Audio Part Editor and press [Ctrl]/[Command]-[A] to select all audio events.
See the Operation Manual for details about slicing.

2. In the Audio Part Editor, click on one of the selected events and drag it to the Groove Agent ONE window.

3. Press the [Shift] key.

4. Point the mouse pointer at an empty pad and let go of the mouse button.
The individual samples from the audio part are now mapped to the available pads of Groove Agent ONE.

Now look at the Exchange section (to the left of the pads): the MIDI Export pad (the field displaying a double arrow) at the bottom of the section is lit. When mapping several samples to several pads, Groove Agent ONE creates a MIDI file containing all MIDI information to trigger these pads, and maps this file to the MIDI Export pad.

5. Drag this MIDI file from the MIDI Export pad onto the Nuendo Project window.
Dropping the file onto the Project window creates a new MIDI track. You can also drop the MIDI file to an existing MIDI or instrument track.

6. Play back the MIDI file.
The unedited MIDI file plays the same groove as the original audio loop. By editing the MIDI file you can change the original groove.

Saving the Groove Agent ONE setup

You can save the current configuration of Groove Agent ONE either as a plug-in preset or as a combination of a Groove Agent ONE archive (.gak) and a plug-in preset.

These presets and archives are useful in cases where you want to use your current settings and samples on a different computer.

Saving plug-in presets

You can save your current Groove Agent ONE configuration, including all settings for samples, pads and groups, as a plug-in preset.

1. At the top of the Groove Agent ONE window, click the VST Sound button to the right of the Presets pop-up menu and select “Save Preset”.
The Save Preset dialog opens.

2. Enter a name for the new preset and click OK.
The preset is saved in the User Content folder on your system.

Loading plug-in presets

To load an existing plug-in preset, proceed as follows:

1. At the top of the Groove Agent ONE window, click the VST Sound button and select “Load Preset” from the pop-up menu.
The Presets browser opens.

2. The Presets browser shows all presets it finds in the VST 3 Presets folder for Groove Agent ONE. Double-click the desired preset to load it.
The Presets browser is closed and the preset is loaded into Groove Agent ONE.

- When a sample belonging to a preset cannot be found, Groove Agent ONE prompts you to locate the missing files. You can click either Ignore to skip this message, click Locate File to navigate to a specific folder containing the missing file(s), or click Search Folder to browse a specific folder and any subfolders that might contain the missing file(s).

Saving a GAK archive

You can save all Groove Agent ONE settings, and the sample files referenced by the current configuration, as a Groove Agent ONE kit. The file name extension of these kit files is “*.gak”. Proceed as follows:

1. Set up Groove Agent ONE the way you want it.

2. In the Exchange section, click the Export button.
The “Export Groove Agent ONE kit” dialog opens in which you can specify a location and a name for the new archive.

3. Click Save.
The archive is created and the dialog is closed.

⚠ Note that a plug-in preset file is created alongside the .gak file. This plug-in preset references the samples inside the .gak file. It can be browsed in the MediaBay, giving you access to all Groove Agent ONE settings (including all samples) from within Nuendo.

Loading a GAK archive

To load the GAK file, proceed as follows:

1. In the Exchange section, click the Import button.
Navigate to the GAK file.

2. Click Open.
The saved settings and all samples are imported into Groove Agent ONE.

Editing sounds

All sound editing functions can be found in and below the LCD display in the left half of the panel.

The LCD display can show four different sound editing pages, selected by clicking one of the four buttons in the Pad Edit section.

The information on the Play page refers to this instance of Groove Agent ONE as a whole. When the Play button is activated, the LCD display shows the name of the loaded VST preset and information on the number of samples and pads used by this instance of Groove Agent ONE. The Size parameter indicates the amount of RAM occupied by the currently loaded samples. The Polyphony counter shows the number of pads currently playing.

On the Voice, Filter, and Amplifier pages, sample-specific data is displayed:

Parameter	Description
Brightness slider	Use the little slider at the very top of the LCD display to set the display brightness.
VST Preset	The name of a loaded VST Preset is displayed in the top left of the LCD display.
Sample/Pad	The name of the sample (and the pad to which it is assigned).
Trash icon	You can remove the current sample assignment by clicking on a pad or on the Layer indicator (see below) and dragging it onto the trash icon.
MIDI input off	When the MIDI symbol button in the top right corner of the LCD display is activated, the LCD display shows the waveform and parameter values of the currently playing sample. When this button is deactivated, the display shows only the data for the currently edit selected sample.
Layer indicator	The long bar near the top of the LCD display shows the active layer for the current pad. If more than one layer exist for the selected pad, the bar is divided accordingly. You can drag the dividing line between layers to change the velocity ranges of the layers. You can drag a new sample from the MediaBay and drop it directly onto the Layer indicator bar (this is the same as dropping a sample on a pad). You can drag layers to a different position on the bar.
Layer number	The layer number indicates which is the active layer of the current pad.
Sample	This is the name of the sample file.
Velocity	Here you can specify a velocity range for the current layer.
Coarse	Here you can tune the sample by up to ±12 semitones.
Fine	This parameter lets you fine-tune the sample by up to ±100 cents.

Parameter	Description
Volume	Sets the sample volume.
Waveform display	The waveform of the current sample.
s/e locators in waveform display	You can define the sample start and end points by dragging the s and e locators in the waveform display. When you click on a locator and press [Ctrl], this will zoom in on the waveform and center the display around the locator. Note that the locators automatically snap to zero crossings.

Depending on the selected page (Play, Voice, Filter, Amplifier), up to six quick controls with different pad-specific parameter assignments are displayed.

Play parameters

The parameter controls on the Play page are copies of the parameters on the Voice, Filter, and Amplifier pages.

The row of parameter controls below the LCD display shows six parameters:

Parameter	Description
Volume	The volume of the pad currently selected for editing.
Pan	The panorama setting of the pad currently selected for editing.
Coarse	Use this control to tune the pad by up to ±12 semitones.
Cutoff	Sets the filter cutoff frequency.
Q	Sets the filter resonance.
Output	Groove Agent ONE provides up to 16 stereo outputs. You can route pads to individual outputs using this control.

Voice parameters

The row of parameter controls below the LCD display shows six parameters:

Parameter	Description
Mode	Here you can reverse the currently selected sample so that you hear it backwards.
Coarse	Use this control to tune the pad by up to ±12 semitones.
Fine	Use this control to fine-tune the pad by up to ±100 cents.
Mute Gr.	With this control you can assign a pad to one of eight mute groups. Pads within a mute group never play back simultaneously. New notes cancel previous notes.
Tr. Mode	The sample of the currently selected pad is played either from start to finish (One Shot) or only for as long as you hold the mouse button/key (Key Hold). Key Hold can also be determined by the length of the corresponding MIDI note on your track.
Output	Groove Agent ONE provides up to 16 stereo outputs. You can route pads to individual outputs using this control. See the Operation Manual for information on how to use multitimbral instruments in Nuendo.

Filter parameters

The row of parameter controls below the LCD display shows four parameters used to edit the Groove Agent ONE filter:

Parameter	Description
Type	Sets the filter type: low-pass (LP), high-pass (HP) or band-pass (BP). When you set this knob to OFF, the settings on this editing page have no effect.
Cutoff	Sets the filter cutoff frequency.
Q	Sets the filter resonance.
Mod	This parameter determines the influence that velocity has on the cutoff frequency. When set to 0%, the setting has no effect. When set to any other value, the cutoff frequency changes depending on the velocity.

Amplifier parameters

The row of parameter controls below the LCD display shows six parameters:

Parameter	Description
Volume	The volume of the pad currently selected for editing.
Pan	The panorama setting of the pad currently selected for editing.
Attack	Controls the amplifier envelope attack time.
Release	Controls the amplifier envelope release time. Reduce the release time to shorten the decay of sounds played in one-shot mode.
Amp Mod	This parameter determines the influence that velocity has on the pad volume setting. When set to 100%, the pad sounds louder the higher the velocity. When set to 0%, velocity has no effect on the pad volume.
Attack Mod	This parameter determines the influence that velocity has on the Attack setting. When set to 0%, velocity has no effect on the attack. When set to 100% and playing a pad with high velocity, the Attack time is increased by 50%. The higher the Attack Mod setting, the longer the additional attack time for a pad.

Master volume

In the Master section in the lower left of the Groove Agent ONE panel you can find a master volume slider that sets the output volume of the instrument.

The Exchange section

This section is used to import or export data to/from Groove Agent ONE.

Importing MPC files

Clicking the Import button opens a file dialog in which you can navigate to a PGM file (.pgm is the AKAI MPC exchange format).

⇨ Groove Agent ONE imports only the mapping data from the PGM file. Any additional information (on MPC effects, etc.) cannot be imported into Groove Agent ONE.

The MIDI Export pad is described in detail in the section "Slicing a loop and triggering individual sounds via MIDI" on page 40.

The function of the Export button is described in detail in the section "Saving a GAK archive" on page 41.

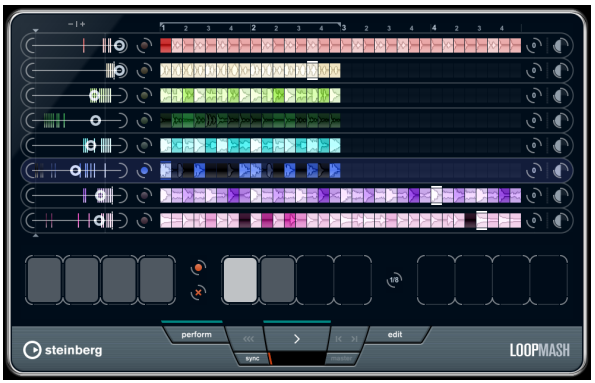
Automation of Groove Agent ONE parameters

When opening an automation subtrack for a track that uses Groove Agent ONE, you can select the following plug-in parameters from the Add Parameters dialog:

- Volume
- Pan
- Mute
- Cutoff
- Resonance

These parameters are available for the pads C1 to B4.

LoopMash



LoopMash is one of a kind: a powerful tool for the slicing and instant re-assembling of any kind of rhythmic audio material. With LoopMash, you can preserve the rhythmic pattern of one audio loop, but you can replace all sounds of this loop with the sounds of up to seven other loops.

LoopMash is fully integrated into Nuendo, which allows you to drag and drop audio loops from the MediaBay or Project window directly onto the LoopMash panel.

Getting started

To give you a first impression of what you can do with LoopMash, we have created a tutorial preset. Proceed as follows:

1. In Nuendo, create an instrument track with LoopMash as the associated VST instrument.
In the Inspector for the new track, click the Edit Instrument button to open the LoopMash panel. It has two main areas: the tracks section in the upper part of the panel, and the parameter section at the bottom.

2. At the top of the plug-in panel, click on the icon to the right of the Preset menu field and select Load Preset from the pop-up menu.

3. The Presets browser opens, showing presets found in the VST 3 Presets folder for LoopMash.

4. Select the preset called "A Good Start…(Tutorial)88".
The Presets browser is closed and the preset is loaded into LoopMash.

5. At the bottom of the panel, make sure that the Sync button below the Transport controls is off, and start playback by clicking the play button.

In the LoopMash panel, you can see a sliced loop waveform in the top (red) track. This track is selected (which is indicated by the track's background color and the lit button to the left of the waveform display).

The selected track holds the master loop. The rhythmic pattern of the LoopMash output is governed by the master loop – i.e. what you hear is the rhythmic pattern of this loop.

6. Look at the row of 12 pads below the track section: the first (leftmost) pad is selected. Select the third pad.
A new loop is displayed on the second track in the track display, and you hear that the snare drum sound of the first loop has been replaced with a handclap sound.

7. Select the fifth, and then the seventh pad. Each time a new loop is added to the mash.
Note how the rhythmic pattern of the music stays the same, although an increasing number of sounds is taken from the other loops.

On the left of each track, you find the similarity gain slider. These sliders are the most important control elements of LoopMash: the further to the right you move the similarity gain slider of a track, the more important the sounds of this particular loop become for the audible output of LoopMash.

How does LoopMash work?

Whenever you import a loop into LoopMash, the plug-in analyzes the audio material. It generates so-called "perceptual descriptors" (information on tempo, rhythm, spectrum, timbre, etc.) and then slices the loop into eighth-note segments.

This means that after you have imported several loops, LoopMash knows the rhythmic pattern of each loop and the location of various sounds that make up this pattern within each loop. During playback, LoopMash uses the perceptual descriptors to determine how similar each slice is to the current slice of the master track.

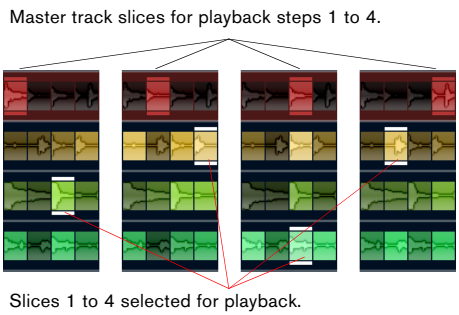
Please note that LoopMash does not categorize the sounds, but looks for overall similarity in the sound. For example, LoopMash might replace a low snare drum sound with a kick drum sound, even though a high snare sound is also available. LoopMash always tries to create a loop acoustically similar to the master loop, but using other sounds.

The similarity is shown by the brightness of each slice on each track, and also by the position of each slice on the similarity gain slider to the left of each track. The brighter a slice, the greater the similarity to the current master track slice, and the further to the right it is displayed on the similarity gain slider. Darker slices have smaller similarity and can be found further to the left on the slider.

The similarity gain settings of the various tracks determine which slice gets playback priority. This creates a new loop, over and over again, but with the rhythmic pattern of the original master loop.

In the following figure you can see four tracks. The track at the top is the master track. During playback, LoopMash moves through the master loop step-by-step (which is indicated by a horizontal line above and below the current slice) and automatically selects four different slices from these tracks to replace the slices of the master track. The currently playing slice is indicated by a white horizontal line above and below the slice.

The following figure shows the result of the selection process for each playback step.



For best performance, use audio files that have the same sample rate as your project (to avoid sample rate conversion when loading presets or storing scenes).

Experiment with the provided LoopMash presets, and with your own loops of different lengths and with different rhythms, containing many different sounds – LoopMash is like an instrument, and we very much encourage you to play it!

LoopMash parameters

You can influence the process of constantly assembling a new loop with the various functions and parameter controls of LoopMash.

⇨ Note that many of LoopMash's parameters can be automated. See the description for the automation of VST instrument parameters in the chapter "VST instruments and instrument tracks" in the Operation Manual.

Track functions

- LoopMash provides advanced drag & drop support. You can drag single loop files from Nuendo or the Explorer/Finder to the tracks on the LoopMash panel.
  The quickest way to find the LoopMash content is to use the MediaBay: Open the VST Sound node and the LoopMash folder. Files can be dragged to LoopMash from the following Nuendo locations: MediaBay, Project window, Pool, Sample Editor (regions), Audio Part Editor. Dragging a loop to a track already occupied replaces the original loop.

- You can audition individual slices on each track by clicking on them.
  You can also use the Step function in the transport controls (see below) to audition single slices.

- You can set a track transposition value.
  Click the button to the right of the waveform and select the desired transposition interval from the pop-up menu. The set value is displayed on the button. Note that this function is tied to the setting for the Slice Timestretch parameter (see below). When Slice Timestretch is deactivated, transposition is created by increasing/decreasing the playback speed of the slices (transposing a track up by one octave corresponds to playing the slices twice as fast). With Slice Timestretch on, you get true pitch shifting, i.e. there is no change in playback speed.

- You can change the relative volumes of your tracks with the volume control on the far right of each track.
  This is useful for level adjustments between tracks. A VU meter to the left of the volume control provides visual feedback of the current volume.

- To remove a loop from a LoopMash track, right-click the track and select "Remove from track".

- One track is always selected. This is the master track: it provides the rhythmic pattern you hear, and it is the sounds of this loop that are replaced by slices selected from the other loops in the current LoopMash configuration.
  Activate the button to the left of the waveform display to select the corresponding track and make it the master.

- A horizontal line above and below individual slices indicates the current playback position within the master loop (in the track color) and the slice currently selected for playback (in white).

- The similarity gain slider (to the left on each track) determines how important a particular track is for the "mashing up" of the master loop.
  Move the slider to the right to select more slices from the corresponding track for playback, and to the left to reduce the number of slices for playback (set to middle position by default).

- Drag the similarity threshold control (the thin line with handles at the top and bottom intersecting all similarity gain sliders) to the left or right to determine a minimum similarity that slices must match to be considered for playback.
  Slices with a similarity below (i.e. to the left of) this threshold are not played.

- The brightness of the slices changes when moving the similarity gain slider.
  The further to the right, the lighter the color, and the higher playback priority for these slices. The currently playing slice is brightest.

- The vertical lines on the similarity gain slider correspond to the slices in this loop.
  The changing pattern of slices indicates similarity of each slice, on all tracks, to the current master track slice. The further to the right a line is, the greater the similarity of this slice to the master slice. A slice must be to the right of the similarity threshold (see above) line to be considered for playback.

- A track can hold up to 32 slices.
  Even if a long loop were to contain more than 32 slices, LoopMash imports only the first 32. Ideally, you would use a loop file cut at bar boundaries. When you import your file from the MediaBay, LoopMash uses the tempo information supplied by the MediaBay for the slicing of the loop.

- At the top of the track section, a ruler showing bars and beats (using the project's time signature) is displayed.

- If you want to shorten the play length of the master loop, you can drag the bracket at the top of the track section.

You can drag the bracket handles, or you can drag the bracket as a whole. This allows you to select even a very small range within your master loop for playback – the rest of the loop is not taken into consideration. Note that short loop ranges (less than 1 bar) may conflict with the Jump interval setting (see below).

Transport controls

The transport controls can be found at the bottom of the LoopMash panel.

Button	Description
Play	Click the Play button to start or stop playback.
Locate	Click the Locate button to return to the beginning of the loop (bar 1/beat 1). Playback always starts automatically when clicking this button.
Step	Clicking in the left/right half of this button steps backwards/forwards through the timeline, playing one slice at a time.

Setting the LoopMash tempo

During playback, LoopMash can be synchronized to the tempo set in Nuendo, or can follow its own tempo setting:

- Click the Sync button (to the left of the tempo field) to activate or deactivate synchronization to the project tempo set in Nuendo.

When Sync is on, playback can be started using the Nuendo transport controls. With Sync off, LoopMash starts playing only when you click the Play button in LoopMash.

- When the Sync button is deactivated, the current LoopMash tempo (in BPM) is displayed in the tempo field below the Play button.

To change the "local" tempo, click in the tempo field, enter a new value, and press [Enter].

- When the Sync button is deactivated, you can click the Master button (to the right of the tempo field) to copy the tempo of the current master loop into the tempo field.

The Sync On/Off parameter can be automated. This is useful to control LoopMash in a Nuendo project – with Sync off, playback within a project is paused.

The Edit page

Click the Edit button (to the right of the transport controls) to open the Edit page. The controls on this page allow you to influence the way in which LoopMash plays back.

The following parameters are available:

Option	Description
Number of Voices	Here you can set the total number of slices from all tracks that are used to replace the master slice (according to the current similarity gain settings). The range is from one (left) to four (right) voices, i.e. sounds from up to four loops can play simultaneously. Increasing the number of voices increases the CPU load.
Voices per Track	This is the maximum number of slices that can be selected from a single track. The range is from one to four. The less slices can be picked from the same track, the more variety you get in the LoopMash output.
Slice Selection Offset	Move this slider to the right to allow slices of smaller similarity to be selected for playback. This setting affects all tracks of this scene (see below).
Random Slice Selection	Move this slider to the right to allow more variation when selecting slices for playback, adding a more "random" feel to the selection process. This setting affects all tracks of this scene (see below).
Slice Quantize	Move this slider to the right to apply quantizing to the slices, i.e. the slices are aligned to a eighth-note grid. When the slider is all the way to the left, the slices follow the rhythmic pattern defined by the original master loop.
Staccato Amount	When you move this slider to the right, the length of the slices is gradually reduced, giving the output a staccato feel.
Slice Timestretch	Use this option to apply realtime timestretching to the slices, filling gaps or avoiding overlaps between slices not played back at their original tempo, or when combining slices with different original tempos. Applying timestretch increases the CPU load and may affect the sound quality. Reduce the need for timestretching by using loops with similar original tempos. See also the description of the track transposition value above.
Dry/Wet Mix	This sets the balance between the volumes of the master loop and the selected slices from the other tracks.

Scenes and the Performance page

Click the Perform button (to the left of the transport controls) to open the Performance page.

The settings you make on this page allow you to store LoopMash configurations so that you can recall them later.

Below the tracks, a row of 12 pads is displayed. You can save one "scene", i.e. a combination of up to eight tracks with all parameter settings, to each of these pads. This means that you can create a LoopMash configuration with up to 96 loops – 12 scenes with eight tracks each.

The following parameters are available:

Option	Description
Scene pad 1–12	Empty scene pads have the same color as the background, pads with associated scenes are gray. The currently selected scene is white. Click on a pad to recall the corresponding scene.
Store Scene	To save the current settings as a scene, first click the round red button (between pads 4 and 5, at the top) and then a pad. This saves your setup to that pad. If you want to cancel a running Store Scene operation, click in an empty area of the plug-in panel.
Empty Scene	To remove a scene from a pad, first click the red x button (between pads 4 and 5, at the bottom) and then the desired pad. If you want to cancel a running Empty Scene operation, click in an empty area of the plug-in panel.
Jump interval (1/8: Now; 1/4: Next beat; 1/2: Next half bar; 1: Next bar; e: End)	To set the behavior when changing from one scene to the next during playback, click the button between pads 8 and 9. A pop-up menu opens allowing you to set at which point the change to the next scene occurs. End means that the current loop is played to the end before switching scenes. When you set up a short loop range (see above), you may need to set the interval to e to ensure that the jump point is reached.
MIDI control	If you have a MIDI keyboard connected to your computer, you can remote control LoopMash by pressing keys on your keyboard: C1-B1: change to pads 1–12 C2: Start D2: Stop E2: Sync On F2: Sync Off

⚠ Once you have set up a LoopMash configuration, you should save it to a scene pad. Changing scenes without saving means discarding any unsaved changes.

Saving and loading VST presets

You can save all current scenes as a VST preset. Proceed as follows:

1. At the top of the LoopMash window, click the icon to the right of the Preset field and select “Save Preset” from the pop-up menu.
The Save Preset dialog opens.

2. Enter a name for the new preset and click OK.
The preset is saved in the User Content folder on your system. Make sure that you tag your presets for better handling in the MediaBay.

To load an existing VST preset, proceed as follows:

1. At the top of the LoopMash window, click the icon to the right of the Preset field and select “Load Preset” from the pop-up menu.
The Presets browser opens.

2. The Presets browser shows all presets it finds in the VST 3 Presets folder for LoopMash. Double-click the desired preset.
The Presets browser is closed and the preset is loaded into LoopMash.

- When a loop belonging to a preset cannot be found, LoopMash displays a standard file dialog in which you can navigate to the file.

⇨ The “Empty” preset clears all settings of the current LoopMash instance.

Embracer – Surround Pad Synthesizer

Embracer is a simple but powerful polyphonic synthesizer designed entirely for producing pads and accompaniment sounds. With its easy-to-use envelope and tone controls, it gives you fast access to the sounds you need without having to search through thousands of presets. However, the most powerful feature of Embracer is its surround output. With a single switch, you can turn the instrument from stereo to surround and the width control allows you to spread your pad sound anywhere from mono to stereo to full 360° surround. The unique “eye” controller gives you an exact idea of how the sound is placed in a mix.

If you have never worked with a surround system before, now is the time to start exploring these possibilities.

The Embracer Surround Pad Synthesizer has the following properties:

- Embracer is a Polyphonic surround pad synthesizer.
- 2 oscillators with 12 waveforms.
- Independent envelope and tone controls.
- Stereo and surround outputs.
- Up to 32 voices of polyphony per instance.
- Dynamic width control for exciting 3D sounds.
- “Eye” controller for simultaneous tone and width control.
- Full MIDI control implementation.

Osc 1 and 2

Parameter	Description
Wave	Selects the waveform for each oscillator. Available waveforms are: Carpet, DigiPad, Choir, Ensemble, Metal Phaze, Phase Strings, Sing Sing, Soft Wave, Spit Strynx, Stepfloor, Submerged, Wave Bellz. Note: If you want to use only one oscillator, set the waveform to OFF. In this case only one voice per key is used.
Tone	Embracer offers a high pass and low pass filter for each oscillator. Both filters are controlled via a single Tone knob. In the 50% center position, the signal is not filtered. Reducing the tone value adds low pass filtering. Values above 50% add high pass filtering. This parameter can also be controlled by the “eye” controller.
Width	Controls the spatial spread of the signal. A value of 0% puts the signal mono into the center position. In stereo mode, a value of 100% results in a maximum stereo width. In surround mode, a value of 100% creates a full 360° surround image. The width parameter can be controlled by a variety of modulation sources, as well as by the “eye” controller.
Coarse (Oscillator 2 only)	Changes the pitch in semitones. Maximum range is +1/24 semitones = 2 octaves.
Fine (Oscillator 2 only)	Changes the pitch in fine steps with a range of up to ±50 cents. Note: If you want to create a slight detune effect between the oscillators, make sure to set the master tune parameter to a negative value of the same amount to keep the instrument in tune.

Envelope and Level

Parameter	Description
Attack	Controls the attack time of each oscillator. Higher values create slower attacks.
Attack Vel	Sets the amount of velocity control of the attack time. Higher values increase the velocity sensitivity.
Level	Controls the oscillator output level.
Level Vel	Sets the amount of velocity control of the oscillator level. Higher values increase the velocity sensitivity.

Master

Parameter	Description
Release	Controls the overall release time of the volume envelope. Higher values result in longer release times.
Mode	Sets the output mode of Embracer. You can choose between “Stereo” and “Surround”. In Stereo Mode, Embracer has one stereo output in the VST Mixer. In Surround Mode, Embracer has either a quadraphonic 4-channel output or two independent stereo outputs in the Mixer. See below for more details on using Embracer in a surround mixer setup.
Width Ctr	Use this parameter to select a modulation source for the width parameter. Available sources are: Mod Wheel, Aftertouch, Velocity and Envelope. Both oscillators are controlled simultaneously. However, modulation depth is controlled independently by the respective width parameter of each oscillator.
Max Poly	Sets the total number of voices available. Each oscillator uses one voice per note played. Thus, a two-oscillator sound with 8 voices results in 4-voice polyphony. The default value for Max Poly is 16.
Fine Tune	Use this to adjust the pitch of the whole instrument. Range is ±50 cents. Use Fine Tune in combination with the Fine Tune parameter of OSC 2 to create smooth detune effects.
Master Out	Sets the overall output volume of the instrument.

The “Eye”

The Embracer’s unique “Eye” controller offers a creative new way of controlling the sound’s overall character and shape. This controller gives you access to several parameters at the same time.

For each oscillator, there is a circle representing the tone and width of the sound. Click and drag the corresponding circle to change its shape. There are also two (numbered) oscillator handles. You can drag these vertically to change the tone or horizontally to change the width of the respective oscillator. When you drag a handle, the respective Tone and Width knobs of the oscillator are adjusted accordingly. Play a note while editing to hear the effect.

The “eye” cannot only be used as a controller for the tone and width parameters, but also works as a surround scope for monitoring the spatial integration of the current sound. The display represents the sound’s position in the stereo or surround sound field. In stereo mode, the sound position is shown only in the upper half of the display and

represents the front part of the sound field. In surround mode, the sound position is shown in the upper and lower half of the display and represents the front and rear part of the sound field.

- You can use Embracer's automation feature to record the movements of the mouse within the "eye" controller!

Using Embracer in Surround Mode

When you want to enjoy Embracer in 3D, set it up in surround mode and listen to it on a surround system. Let's assume you have a surround monitoring system set up with your VST mixer and your VST output connections are properly set up. Proceed as follows:

1. Open an instance of Embracer in the VST instruments rack and set it to surround mode.

2. When you open the mixer you see two separate stereo channels for the Embracer. The first is titled "Embracer" and the second "Embracer rear".

3. Assign both channel outputs to the surround output bus.

The two channel strips now show independent surround panners. By default, the first output pair is assigned to the front left and right channels and the second output pair to the rear left and right channels. The surround width can be controlled with the "width" parameter.

4. Double-click on the surround panner to open its control panel. Set the "Mono/Stereo" parameter to either "Y-Mirror", "X-mirror" or "XY-mirror". You can now freely adjust the surround panning to your taste.

5. If your surround configuration includes a center or LFE channel, you can also add some of Embracer's signal to the center or LFE channels. Feel free to experiment to find out what works best in a given project and mix.

Monologue – Monophonic Analog Modeling Synthesizer

Monologue is a monophonic analog synthesizer based on physical modeling technology. It offers full, rich and colorful sounds without consuming a lot of CPU power. The Monologue synthesizer is the perfect tool for bass, lead and sequenced sounds.

The Monophonic Analog Modeling Synthesizer has the following properties:

- 2 oscillators with sawtooth, square and triangle waveforms.
- An additional noise generator for white noise.
- Monologue has two filters: a high pass filter and a versatile multimode filter.
- Monologue has a single LFO.
- Monologue has 4-stage ADSR mod and amp envelopes.
- Monologue has an effects section with chorus, phaser, and flanger effects, plus separate delay and overdrive units.
- Monologue has a X/Y matrix pad for additional realtime modulation with access to all Monologue parameters.

Osc 1 and 2

Parameter	Description
Waveform (pop-up menu)	This is where you select the waveform: Saw, Square and Sub for oscillator 1 and Saw, Square and Triangle for Oscillator 2.
Coarse	Sets the coarse pitch in semitones. The available range is ±1 octave.
Fine	Allows you to fine-tune the pitch in cent increments. The available range is ±50 cents.
Depth	Controls the pitch modulation depth for the mod source defined in the “mod src” field. The available range is ±1 octave.
Mod Src	Defines the pitch modulation source. Available sources are: Modwheel, Aftertouch, Pitchbend, Velocity, LFO and Mod Env.
PWM (OSC2 only)	Controls the pulse width of the square wave. In the center position, pulse width is 50/50. Turning the PWM knob clockwise or counter clockwise creates a positive or negative pulse, respectively.
Sync (OSC2 only)	Activating the sync button synchronizes the pitch of oscillator 2 to the pitch of oscillator 1. When this is active, changing or modulating the pitch of oscillator 2 changes the tone and not the pitch. For the typical sync sound, turn osc 1 down in the mix and use osc 2 only.

Mix

Parameter	Description
Osc 1	Sets the pre-filter level for oscillator 1.
Noise	Sets the pre-filter noise level.
Osc 2	Sets the pre-filter level for oscillator 2.

Filter

Parameter	Description
Mode	Sets the filter type. Available filter types are 24 dB Low pass, 18dB Low pass, 12dB Low pass, 6dB Low pass, 12dB Band pass and 12dB High pass.
Cutoff	Sets the filter cutoff frequency. How this parameter operates is governed by the filter type.
High Pass	Sets the cutoff frequency of the additional high-pass filter.
Res	Changes the resonance of the multi-mode filter. Full resonance puts the filter into self-oscillation.
Key Track	Determines the amount of key tracking applied to the filter cutoff frequency. The available range is 0 to 100%. A range of 100% tunes the filter cutoff frequency to the keyboards pitch 1:1.
Mod Src (A+B)	Defines the filter modulation source. The available sources are: Modwheel, Aftertouch, Pitchbend, Velocity, LFO, and Mod Env.
Depth (A+B)	Controls the filter modulation depth for the mod source set in the “mod src” field.

Envelope

Parameter	Description
A – (Attack)	Sets the attack time.
D – (Decay)	Sets the decay time.
S – (Sustain)	Sets the sustain level.
R – (Release)	Sets the release time.
Mod Src (A+B)	Defines the envelope modulation source. You can select: Modwheel, Aftertouch, Pitchbend, Velocity, LFO and Mod Env.
Depth (A+B)	Controls the envelope modulation depth for the mod source defined in the “mod src” field.

LFO

Parameter	Description
Waveform (pop-up menu)	Here, you can select the waveform for the low frequency oscillator. Available waveforms are: Triangle, Square, Sawtooth, Sample & Hold and Random.
Rate	Adjusts the frequency of the LFO, thus changing the rate of the modulation. Depending on the LFO sync parameter, you can edit the rate in Hertz or in note values.
Sync	When “Sync” is “on” the LFO speed is synchronized to the sequencer’s tempo. This also affects the LFO rate format.
Mod Src	Defines the LFO modulation source. Available sources are: Modwheel, Aftertouch, Pitchbend, Velocity, LFO and Mod Env.
Depth	Controls the LFO modulation depth for the mod source defined in the “mod src” field.

X/Y Pad

Parameter	Description
X Par	Sets the parameter to be modulated on the x axis of the XY Pad. All of Monologue’s parameters are available as destinations.
Y Par	Sets the parameter to be modulated on the y axis of the XY Pad.
XY Pad	Use the mouse to control any two of Monologue’s parameters in combination. By moving the mouse horizontally, you can control the x parameter, by moving it vertically, you can control the y parameter. You can also record controller movements as automation data.

Effects

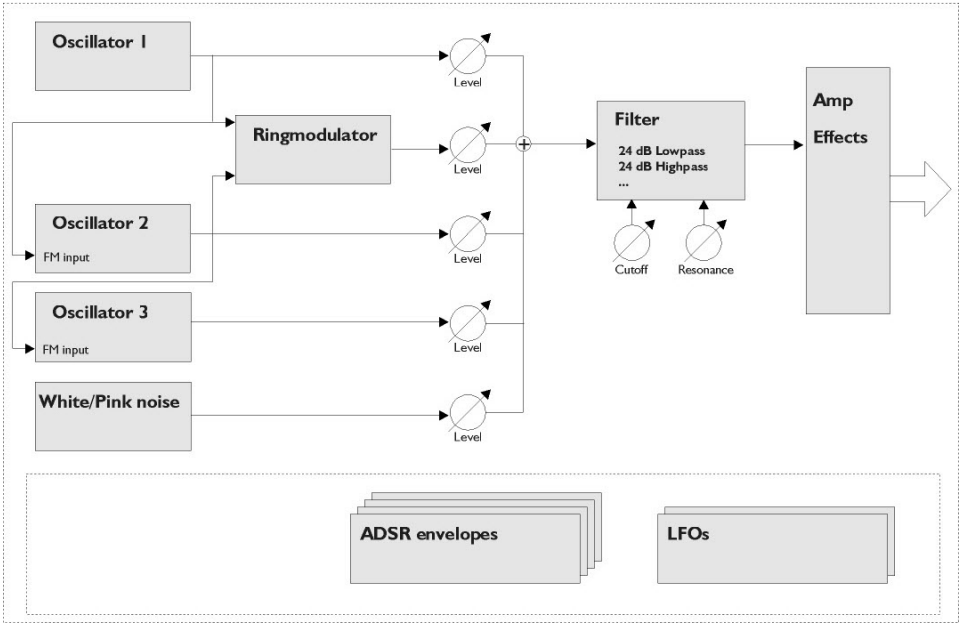
Parameter	Description
FX Type (pop-up menu)	Selects the effect type for Monologue's pitch effects. The available types are Chorus, Flanger and Phaser.
Rate	Use this to adjust the rate of the effect modulation.
Depth	Use this to adjust the depth of the effect modulation.
FBK	Controls the feedback of the effect.
Mix	Controls the balance between dry and wet (effect) signal. Set to 0, the effect is off. Set to 50, the balance between dry and wet signal is 50/50.
Overdrive	Controls the amount of overdrive (distortion) added to the signal. A slight amount of overdrive creates punch and bottom. Higher amounts add distortion.
Delay	Sets the delay time in musical values. The delay effect is always in sync with the song tempo.
Spread	Controls the stereo spread of the delay signal. If you set this to 0, the delay is centered mono. Higher amounts of spread shift the left and right delay channels. If you set this to 100, the delays "ping-pong" between the left and right channels at an even rate.
Tone	Adds a low pass filter to the delay. Increasing "tone" makes every delay repetition darker in tone.
FBK	Controls the amount of feedback of the delay. High feedback levels create infinite delays. Use this parameter with caution.
Mix	Controls the balance between dry and wet (effect) signal. Set to 0, the effect is off. Set to 50, the balance between dry and wet signal is 50/50.

Master

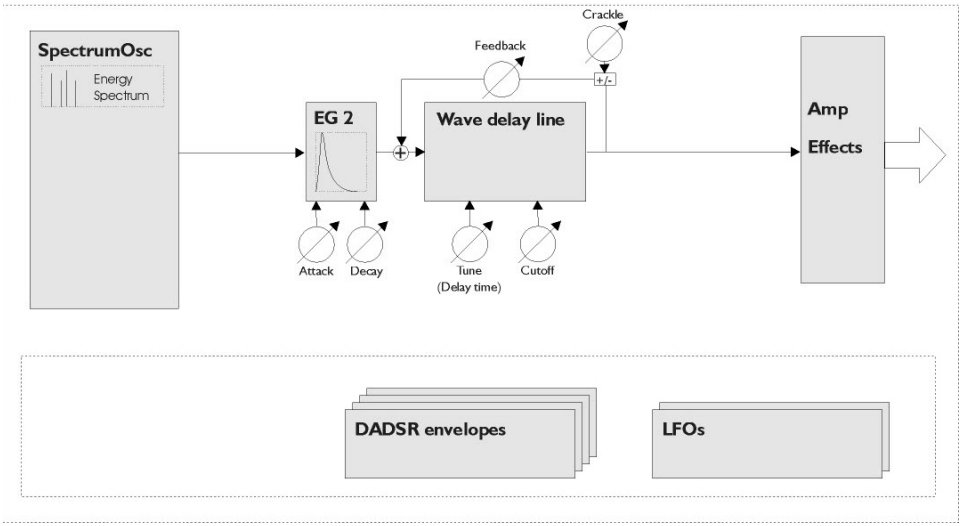
Parameter	Description
Glide Mode	The available modes are: "held", "on" and "off". With "held" selected, a glide effect only occurs for notes played legato.
Rate	Controls the glide rate – the time it takes for a note to reach its destination pitch.
PB Range	Controls the range of a pitch bend MIDI controller. Range can be set between 1 and 24 semitones for a total of two octaves.
Env Trigger	When set to "Multi", each keystroke re-triggers the envelopes. When set to "single", legato notes do not retrigger the envelopes, effectively holding the envelopes on the sustain level until all keys are released before a new note is triggered.
Note Priority	Defines which note is played when multiple keys are held. Options are: First, Lowest, Highest, and Last.
Oct	Controls the master pitch of Monologue in octave steps. Range is ±4 octaves.
Master Out	Controls the master output level that is sent to the VST mixer. Use it to adjust the balance between different presets. Use the VST mixer channel volume to control or automate the Monologue master volume.
Keyboard	Pressing the "keyboard" button reveals a six octave virtual keyboard. Pressing the "keyboard" button again hides the keyboard and displays the master section again.

Diagrams

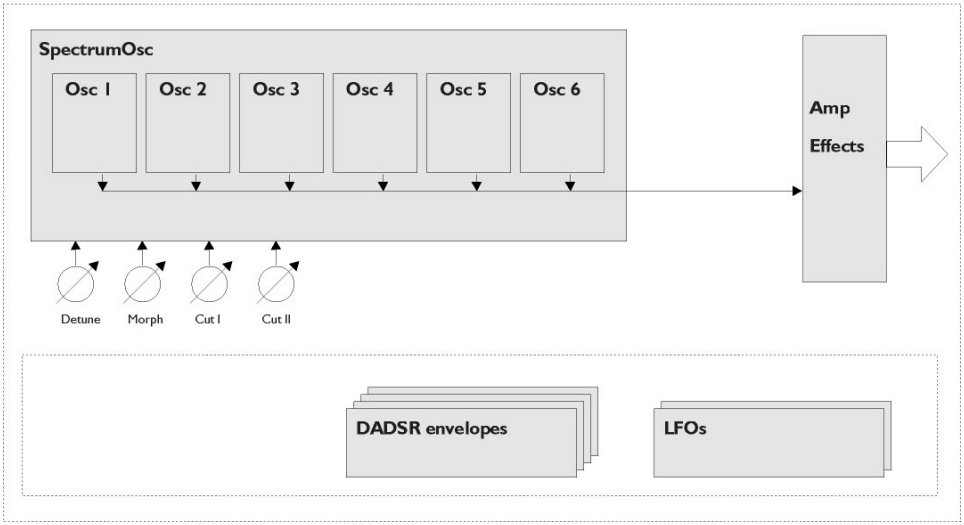
Prologue



Mystic



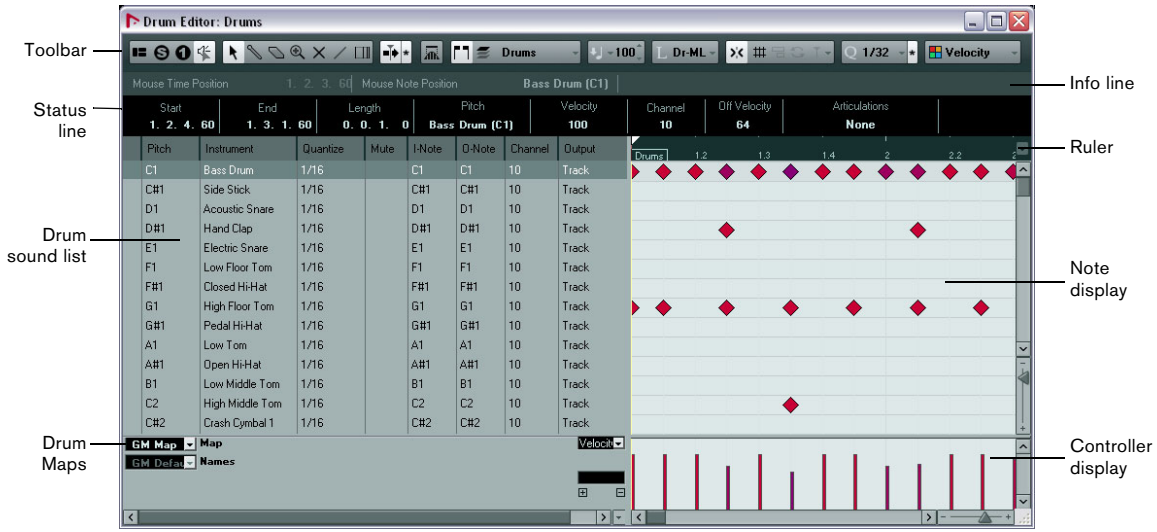
Spector


SpectrumOsc
Osc 1
Osc 2
Osc 3
Osc 4
Osc 5
Osc 6
Amp
Effects
Detune
Morph
Cut I
Cut II
DADSR envelopes
LFOs

4

Editing drums

The Drum Editor – Overview



The Drum Editor is similar to the Key Editor (see the chapter “The MIDI editors” in the Operation Manual), 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’re editing drum or percussion parts.

Double-clicking a MIDI part in the Project window opens the editor selected on the Default Edit Action pop-up menu in the Preferences dialog (Event Display–MIDI page). However, if the “Edit as Drums when Drum Map is assigned” option is activated and a drum map is selected for the edited track (see “Selecting a drum map for a track” on page 60), the Drum Editor opens. This way you can double-click other MIDI parts to open the Key Editor (or the Score Editor, List or Edit In-Place Editor, depending on your preferences) but drum tracks automatically open in the Drum Editor.

The toolbar, status line, and info line

These are much the same as the toolbar, status line, and info line in the Key Editor (see the chapter “The MIDI editors” in the Operation Manual), with the following differences:

- The Drum Editor has no Pencil tool – instead there is a Drumstick tool (for entering and removing notes) and a Line tool with various line and curve modes (for drawing several notes in one go or editing controller events).
- There are no Scissors and Glue Tube tools in the Drum Editor.
- As in the Key Editor, the Mouse Time Position and Mouse Note Position displays on the status line show the position and pitch at the pointer, but the pitch is shown as a drum sound name rather than a note number.
- The Use Global Quantize button allows you to select which value is used when Snap is activated – the global quantize value on the toolbar or the individual quantize values for the drum sounds.
- Instead of a Length Quantize pop-up menu, there is an Insert Length pop-up menu.
  It is used in much the same way, as described on the following pages.
- The status line does not contain a chord display.

The drum sound list

The drum sound list lists all drum sounds by name (according to the selected drum map or name list – see below), and lets you adjust and manipulate the drum sound setup in various ways.

Pitch	Instrument	Quantize	Mute	I-Note	O-Note	Channel	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
G#1	Pedal Hi-Hat	1/16		G#1	G#1	10	Track
A1	Low Tom	1/16		A1	A1	10	Track
A#1	Open Hi-Hat	1/16		A#1	A#1	10	Track
B1	Low Middle Tom	1/16		B1	B1	10	Track

The drum sound list for the GM Map

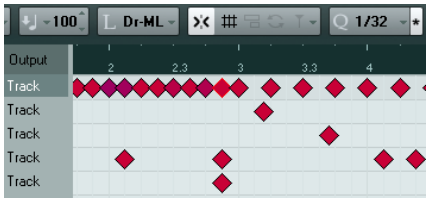
The following settings are available in the drum sound list:

Column	Description
Pitch	The 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	The name of the drum sound.
Quantize	This value is used when entering and editing notes as described in the sections "Creating and editing notes" on page 57 and "Moving, duplicating, or repeating notes" on page 57.
Mute	Allows you to mute a drum sound, excluding it from playback, see "Muting notes and drum sounds" on page 58.
I-Note	This is the "input note" for the drum sound. When this MIDI note is sent into Nuendo, (i.e. played by you), the note is mapped to the corresponding drum sound (and automatically transposed according to the Pitch setting for the sound).
O-Note	This is the "output note", i.e. the MIDI note number that is sent out every time the drum sound is played back.
Channel	The drum sound is played back on this MIDI channel.
Output	The drum sound is played back on this MIDI output. If you set this to "Default", the MIDI output selected for the track is used.

Please note the following:

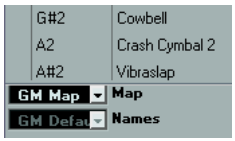
- The number of columns in the list depends on whether a drum map is selected for the track or not.
See "Working with drum maps" on page 58.
- You can reorder the columns by dragging the column headings, and resize them by dragging the dividers between the column headings.

The 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, just as in the Key Editor. Note, however, that the diamond symbols do not indicate the length of the notes. This makes sense, since drum sounds most often are "one-shot" samples that play to their end regardless of the note lengths.

Drum map and names pop-up menus



Below the drum sound list there are two pop-up menus, used for selecting a drum map for the edited track or (if no drum map is selected) a list of drum sound names. For an explanation of drum maps, see "Working with drum maps" on page 58.

Controller display

The controller display in the Drum Editor is the same as in the Key Editor. You can add or remove controller lanes via the context menu, and create and edit events as described in the chapter "The MIDI editors" in the Operation Manual.

- Note that when you select a line in the drum sound list (to the left of the event display), only the velocity controller events belonging to the note events on this line are displayed in the controller display.

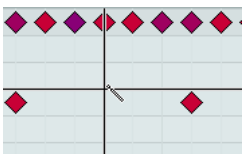
- You can select more than one line in the drum sound list (using [Shift] or [Ctrl]/[Command] as usual), which shows all velocity controller events for all notes on all selected lines.
This helps you when having to adjust the controller values between different drum sounds.

Drum Editor operations

The basic handling (zooming, playback, auditioning, etc.) is the same as in the Key Editor (see the chapter "The MIDI editors" in the Operation Manual). The following sections describe the procedures and features specific to the Drum Editor.

Creating and editing notes

The standard way of entering notes in the Drum Editor is to click with the Drumstick tool.



The position of the created note depends on the following factors:

- If Snap is deactivated on the toolbar, the note appears exactly where you clicked.
In this mode, notes can be positioned freely.

- If Snap is activated and Use Global Quantize is deactivated on the toolbar, the note snaps 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. You may for example want hi-hat notes snap to sixteenth notes, but snare and bass drum snap to eighth notes.

- If Snap and Use Global Quantize are activated, the note snaps to positions according to the Quantize setting on the toolbar (next to the Use Global Quantize button).

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.

- You can quickly audition the drum sounds by clicking in the leftmost column in the drum sound list.
This plays the corresponding note.

- Clicking with the Drumstick tool on an existing note removes it.
This makes drum pattern editing very quick and intuitive.

Setting velocity values

The notes you enter get the insert velocity value set in the Insert Velocity field on the toolbar – to speed up things you may want to assign key commands to the insert velocity options, see "Setting velocity values" on page 57.

Selecting notes

Selecting notes is done by any of the following methods:

- Use the Arrow tool.
The standard selection techniques apply.

- Use the Select submenu on the context menu.

- Use the left and right arrow keys on the computer keyboard to step from one note to the next or previous note.
If you press [Shift] and use the arrow keys, the current selection is kept, allowing you to select several notes.

- You can also press [Shift] and double-click on a note to select all the following notes for the same drum sound.

- If the "Auto Select Events under Cursor" option is activated in the Preferences dialog (Editing page), all notes "touched" by the project cursor are automatically selected.

Moving, duplicating, or repeating notes

To move or copy notes in the editor (to other positions or other drum sounds), you use the same methods as in the Key Editor: click and drag, use the arrow keys or Edit menu functions, etc. (see the chapter "The MIDI editors" in the Operation Manual). To help you identify the right notes, the

drum sound names as defined in the drum map are displayed in the Pitch field in the Drum Editor info line and, when dragging notes in the event display, in the text fields displayed next to the mouse pointer.

There is one other thing to note:

If the moved/copied notes have different quantize values and Snap is activated but Use Global Quantize is deactivated, the largest value determines snapping. For example, if you are moving two notes, with the quantize values 1/16 and 1/4 respectively, the notes snap to quarter notes (1/4).

⇨ You can also adjust the position of notes by quantizing (see the chapter “The MIDI editors” in the Operation Manual).

Muting notes and drum sounds

You can mute individual notes by clicking or enclosing them with the Mute tool or by using the Mute function on the Edit menu.

Furthermore, if a drum map is selected (see “Selecting a drum map for a track” on page 60), the drum sound list has a Mute column. Click in the Mute column for a drum sound to mute that sound. Clicking the Solo Instrument button mutes all drum sounds other than the selected one.

Pitch	Instrument	Quantize	Mute	I-Note	O-Note	Channel
C1	Bass Drum	1/16		C1	C1	10
C#1	Side Stick	1/16		C#1	C#1	10
D1	Acoustic Snare	1/16		D1	D1	10
D#1	Hand Clap	1/16		D#1	D#1	10
E1	Electric Snare	1/16		E1	E1	10
F1	Low Floor Tom	1/16		F1	F1	10

⚠ Please note that the mute state for drum sounds is part of the drum map. Therefore, any other tracks using the same map are also affected.

Deleting notes

To delete notes, click on them with the Drumstick or Erase tool, or select them and press [Backspace].

Other editing methods

As in the Key Editor, you can edit notes on the info line or via MIDI, and enter notes using step input (see the chapter “The MIDI editors” in the Operation Manual).

Working with drum maps

Background

A drum kit in a MIDI instrument is most often a set of different drum sounds with each sound placed on a separate key (i.e. the different sounds are assigned to different MIDI note numbers). One key plays a bass drum sound, another a snare, and so on.

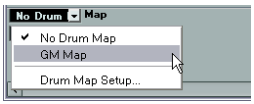
Unfortunately, different MIDI instruments often use different key assignments. This can be troublesome if you have made a drum pattern using one MIDI device, and then want to try it on another. When you switch devices, it is very likely that your snare drum becomes a ride cymbal or your hi-hat becomes a tom, etc. – just because the drum sounds are distributed differently in the two instruments.

To solve this problem and simplify several aspects of MIDI drum kits (like using drum sounds from different instruments in the same “drum kit”), Nuendo features so-called 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 being sent to the MIDI instrument. Among other things, the map determines which MIDI note number is sent out for each drum sound, and so which sound is played in the receiving MIDI device.

A solution to the problem above therefore is to set up drum maps for all your instruments. 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.

Drum map settings

A drum map consists of settings for 128 drum sounds (one for each MIDI note number). To get an overview of these settings, open the Drum Editor and use the Map pop-up menu below the drum sound list to select the “GM Map” drum map.



This drum map is set up according to the General MIDI standard. For information on how to load, create and select other drum maps, see “Managing drum maps” on page 60.

⇨ All settings in a drum map (except the pitch) can be changed directly in the drum sound list (see “The drum sound list” on page 56) or in the Drum Map Setup dialog (see “The Drum Map Setup dialog” on page 60). These changes affect all tracks that use the drum map.

About pitch, I-note, and O-note

This can be a somewhat confusing area, but once you have grasped how it all works it is not very complicated. 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.

As mentioned earlier, a drum map is a kind of “filter”, transforming notes according to the settings in the map. It does this transformation twice; once when it receives an incoming note (i.e. when you play a note on your MIDI controller) and once when a note is sent from the program to the MIDI sound device.

In the following example, we have modified the drum map so that the Bass Drum sound has different pitch, I-note, and O-note values.

Pitch	Instrument	Quantize	M	I-Note	O-Note	Channel	Output
C1	Bass Drum	1/16		A1	B0	10	Track
C#1	Side Stick	1/16		C#1	C#1	10	Track
D1	Acoustic Snare	1/16		D1	D1	10	Track

I-notes (input notes)

Let’s look at what happens on input: 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 may want to place some 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, and so on. If you never play your drum parts from a MIDI controller (but draw them in the editor) you do not need to care about 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 do not need to care about this anymore – you just select another drum map when you want to use another MIDI instrument for drum sounds.

The Channel and Output settings

You can set separate MIDI channels and/or MIDI outputs for each sound in a drum map. The following rules apply:

- 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.
  In other words, the MIDI channel setting you make in the Track list or Inspector for the track is normally disregarded. If you want a drum sound to use the channel of the track, set it to channel “Any” in the drum map.

- If the MIDI output is set to “default” for a sound in a drum map, the sound uses the MIDI output selected for the track.
  Selecting any other option allows you to direct the sound to a specific MIDI output.

By making specific MIDI channel and output settings for all sounds in a drum map, you can direct your drum tracks directly to another MIDI instrument simply by selecting another drum map – you do not need to make any channel or output changes for the actual track.

⇨ To select the same MIDI channel for all sounds in a drum map, click in the Channel column, press [Ctrl]/[Command] and select the desired channel. All drum sounds are set to this MIDI channel. The same procedure can be used for selecting the same MIDI output for all sounds as well.

It can also be useful to select different channels and/or outputs for different sounds. This allows you to construct drum kits with sounds from several different MIDI devices, etc.

Managing drum maps

Selecting a drum map for a track

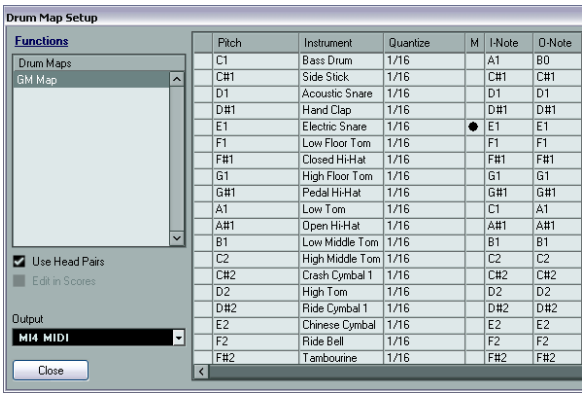
To select a drum map for a MIDI track, use the Map pop-up menu in the Inspector or in the Drum Editor.

Selecting “No Drum Map” turns off the drum map functionality in the Drum Editor. Even if you do not use a drum map, you can still separate sounds by name using a name list (see “Using drum name lists” on page 61).

⚠ Initially, the Map pop-up menu only contains one map: “GM Map”. However, a number of drum maps are included on the program DVD – how to load these is described below.

The Drum Map Setup dialog

To set up and manage your drum maps, select Drum Map Setup from the Map pop-up menu or the MIDI menu. This opens the following dialog:



This is where you load, create, modify, and save drum maps. The list on the left shows the currently loaded drum maps; selecting a drum map in the list displays its sounds and settings on the right.

⇨ The settings for the drum sounds are exactly the same as in the Drum Editor (see “Drum map settings” on page 59). As in the Drum Editor, you can click the leftmost column to audition a drum sound.

⇨ If you audition a sound in the Drum Map Setup dialog and the sound is set to MIDI output “Default”, the output 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, as described in section “The Channel and Output settings” on page 60.

Open the Functions pop-up menu in the top left corner to open a list of available functionalities:

Button	Description
New Map	Click this to add a new drum map to the project. The drum sounds are named “Sound 1, Sound 2”, and so on, and have all parameters set to default values. The map is named “Empty Map”, but you can rename it by clicking and typing in the list.
New Copy	Adds a copy of the currently selected drum map. This is probably the quickest way to create a new drum map: select the map that is similar to what you want, create a copy, change the desired drum sound settings, and rename the map in the list.

Button	Description
Remove	Removes the selected drum map from the project.
Load…	Opens a file dialog, allowing you to load drum maps from disk. The Nuendo DVD contains a number of drum maps for different MIDI instruments – use this function to load the desired maps into your project.
Save…	Opens a file dialog for saving the drum map selected in the list. If you have created or modified a drum map, you can use this function to save it as a file on disk – this allows you to load it into other projects. Drum map files have the extension ".drm".
Edit head pairs…	Allows you to customize the note pairs, see "Customizing note head pairs" on page 198.
Init Display Notes	Allows you to reset the Display Notes entry to the original setting, i.e. the Pitch entry.
Close	Closes the dialog.

⇨ Drum maps are saved with the project files. If you have created or modified a drum map, use the Save function to store it as a separate XML file, available for loading into other projects.

⇨ If you always want to have the same drum map(s) included in your projects, you may want to load these into the template – see the chapter "File Handling" in the Operation Manual.

O-Note Conversion

This function on the MIDI menu goes through the selected MIDI part(s) and sets the actual pitch of each note according to its O-note setting. 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. A typical application is if you want to export your MIDI recording as a standard MIDI file – by first performing an O-Note Conversion you make sure that your drum tracks play back as intended when they are exported.

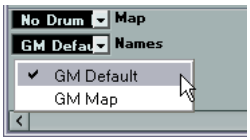
Use Head Pairs and Edit in Scores

These options are explained in detail in the section "Setting up the drum map" on page 197.

Using drum name lists

Even if no drum map is selected for the edited MIDI track, you can still use the Drum Editor. As previously mentioned, the drum sound list then only has four columns: Audition, Pitch, Instrument (drum sound name), and Quantize. There is no I-note and O-note functionality.

In this mode, the names shown in the Instrument column depend on the selection on the Names pop-up menu, just below the Map pop-up menu in the Drum Editor.



The options on this pop-up menu are the currently loaded drum maps plus a "GM Default" item, which is always available. This means you can use the drum sound names in any loaded drum map without using I-notes and O-notes if you want to.

5

VST Expression

Introduction

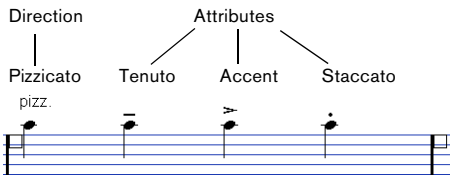
About articulations

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 notes are played shorter.



Musical expressions in the Score Editor

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, these articulations need to be realized as different sounds. This can be achieved using the following command and data types, which are used to trigger the necessary sound changes:

Option	Description
Program Change	Via Program Change messages, you can 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 so-called 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.
MIDI editing	Articulations like staccatos or accents can be created by modifying the actual MIDI data, e.g. by changing length or velocity.

Expression maps

When working on a project, you might want to audition a composition including articulations and other notation expressions. In Nuendo, this can be achieved using the VST Expression functionality. This feature makes use of so-called “expression maps”, which can be selected via a separate pop-up menu in the Inspector for MIDI or instrument tracks. Within these maps, the sound mapping and characteristics for all your musical expressions can be specified, using the methods described in the above table.

In detail, this works as follows:

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 then 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, see “Groups” on page 68.

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 (see “Creating and editing expression maps” on page 67).

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.

VST Expression in Nuendo

The VST Expression functionalities 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.

An example

To get a quick impression of the VST Expression function in Nuendo, take a look at an example project:

1. Open the project "VST Expression Demo", which you can find on the program DVD in the Additional Content folder (Demo Projects subfolder).
This project contains 5 instrument tracks, each of which is assigned to a HALionOne instance that uses an expression map suited for the respective sound. The track presets used in this project are installed with the program and make use of the HALionOne Expression Set.

2. Now look at the track list. The "Nylon Guitar" track is selected.
The events on this track are shown in the Score Editor. In the Inspector, the VST Expression tab is displayed, showing the expression map for the guitar.

3. Start playback.
In the Score Editor, you can see several articulation symbols. Whenever such a symbol is reached during playback, the expression map switches to another sound slot.

4. Double-click on one of the Nylon Guitar parts.
The Key Editor opens. Here, the articulations that are shown as articulation events on the Articulation lane (not as symbols as in the Score Editor). For further information, see "Articulations in the Key, Drum, and In-Place Editors" on page 65.

5. On the MIDI menu, select "VST Expression Setup…".
The VST Expression Setup window opens. This shows the details of the expression map and can be used to create or edit expression maps, see "Creating and editing expression maps" on page 67.

6. In the Expression Maps section to the left, select the Map "Nylon Guitar".
In the Sound Slots list in the middle section of the window, the different articulations are shown, together with the symbols that are used. If you select the slots in the list, you can see that they all have different key switches that are sent to the connected instrument (HALionOne in this example). Using this key switches the instrument is instructed it to switch to another set of samples, to play back a different articulation.

The four other tracks in the project also use a HALionOne program and a separate expression map. For these too, the articulations are triggered by key switches sent to the VST instrument.

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. Track presets are described in detail in the chapter "Working with track presets" in the Operation Manual.

The following applies:

- Included with Nuendo are several track presets which are pre-configured for use with VST Expression. 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".
The same sounds that are used in these track presets are also available as part of VST3 presets for HALionOne (with the same name). This allows you to use them more flexibly with your expression maps in your projects.
- Track presets for HALion Symphonic Orchestra can also be used with VST Expression. 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".

Expression maps that were saved separately

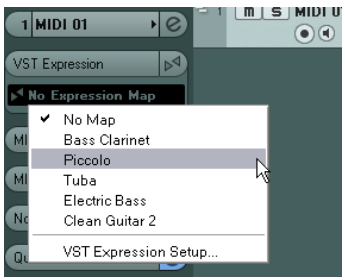
It is also possible to define your own expression maps, see “Creating and editing expression maps” on page 67. To load these, proceed as follows:

1. In the Inspector for the selected track, select the VST Expression section, open the Expression Map pop-up menu and select “VST Expression Setup…”.
If the VST Expression tab is not shown in the Inspector, right-click on another Inspector tab and select “VST Expression” from the context menu.

2. In the VST Expression Setup dialog, click the Load button in the Expression Maps section on the left.
A file dialog appears.

3. Locate and select an expression map and click Open.
The expression map is added to the Maps list.

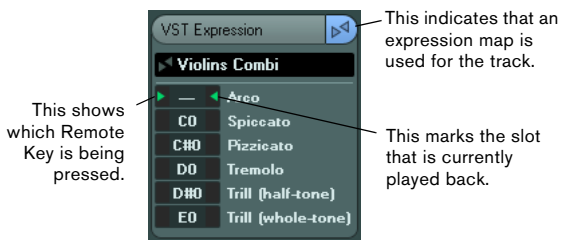
4. Repeat the steps for all the maps that you want to make available, and close the dialog.



All loaded maps are available on the Expression Map pop-up menu in the Inspector.

Articulations in the Project window

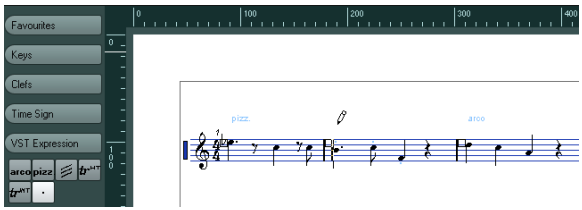
In the Inspector for MIDI and instrument tracks, a VST Expression section is available. This indicates whether an expression map is used for a track. It also shows the sound slots that are active for playback and for realtime input.



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.

Articulations in the Score Editor

In the Score Editor, articulations 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 VST Expression 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.

⇨ In the Preferences dialog (Score–Colors for Additional Meanings page), you can specify a color for VST Expression 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, see the chapter “Working with symbols” on page 139.

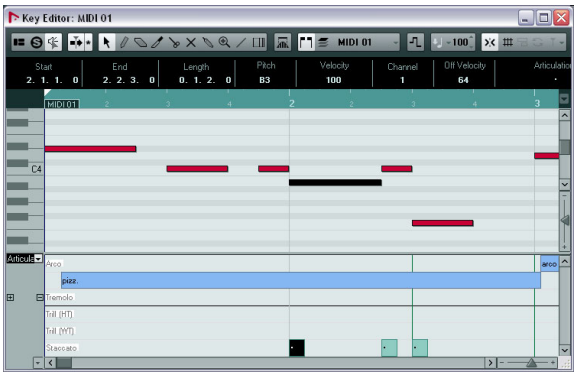
⚠ Note that in the Score Editor, it is possible to insert symbols for a single note that in fact cannot be combined in a musically meaningful way. So when entering articulations, make sure that they do not collide with other articulations.

Articulations 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, see “Editing Articulations” on page 68) is also shown.

You can insert and edit musical expressions in the Key, Drum, and In-Place Editors using the controller lane. This is much like regular controller lane editing (see the chapter “The MIDI editors” in the Operation Manual).

To display the available articulations (i.e. all articulations set up in the selected expression map), open the pop-up menu to the left of the lane and select “Articulations”.



- When “Articulations” 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, see “Groups” on page 68. 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.

Editing on the controller lane

- To insert new directions on the controller lane, select the Pencil 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 Pencil tool, you can also hold down [Alt]/[Option] and click at the desired position.

- To insert new attributes on the controller lane, select the Pencil tool and click at the respective note line in the corresponding row of the controller lane.
Instead of selecting the Pencil 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 Eraser tool or select it and press [Delete] or [Backspace].

- To remove an attribute, click on it with the Pencil 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.

⇨ If several notes are selected, you can use the Pencil 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:

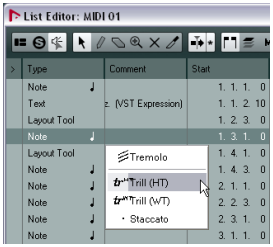
- All note attributes available in the expression map are shown on the pop-up menu, sorted by group (see “Groups” on page 68).

- 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.

Articulations 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, see above.



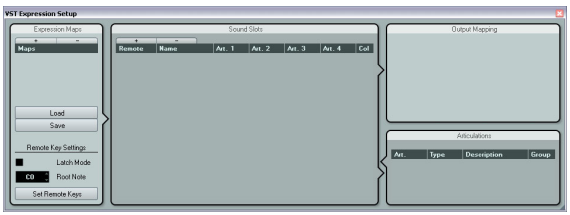
Directions can be shown either as Text or as Graphic Symbols (like in the Score Editor). Either way, they are followed by the text "VST Expression" in brackets, so as to be easily recognizable and distinguishable from ordinary Score symbols.

Creating and editing expression maps

Creating an expression map

Proceed as follows:

1. In the Inspector for a MIDI or instrument track, open the VST Expression section, open the Expression Map pop-up menu and select "VST Expression Setup…" (or select "VST Expression Setup…" on the MIDI menu).
The VST Expression Setup window opens, allowing you to load and create expression maps.



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).

Adding sound slots

Now, you create the "sound slots", one for each articulation that you want to add. Proceed as follows:

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 you 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, see "Articulations in the Project window" on page 65.

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.
For more information, see "Remote Key Settings" on page 69.

Output Mapping

When you have added the desired sound slots, you can map these to certain "sound characters" or "expressions" of an instrument, e.g. a bowed violin or a pizzicato violin, a plain trumpet, a muted trumpet or a trumpet playing staccato. The available sounds depend on the instrument that is selected for the MIDI or instrument track. You can also create expressions by editing the incoming MIDI data, for example by changing the note length or velocity. This is done in the Output Mapping section.

The following parameters are available:

Parameter	Description
1st/2nd Key Switch	If you have an instrument that uses key switches (e.g. Steinberg's HALion Symphonic Orchestra), you can enter up to two key switches in these fields. This allows you, for example, to switch between a bowed and a pizzicato violin.
Program	Here you can specify a Program Change number, to switch to another program containing a different articulation on a connected instrument.
Channel	Here you can specify the MIDI channel to be used. When using with 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:

Option	Description
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, see “Articulations in the Project window” on page 65.

⇨ If you do not plan to record or trigger articulations via a MIDI input device, you do not need to specify remote keys.

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.

⚠ 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. Proceed as follows:

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.

6

How the Score Editor works

About this chapter

In this chapter you learn:

- How the Score Editor and MIDI data relate.
- What Display Quantize is and how it works.

Welcome!

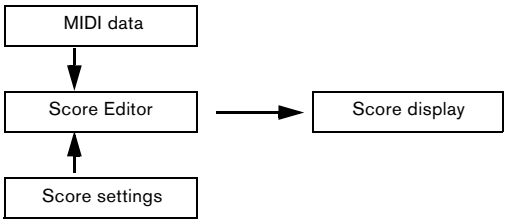
Welcome to scoring in Nuendo! The Score Editor has been created to allow you to get any possible piece of music displayed as a score, complete with all the necessary symbols and formatting. It allows you to extract parts out of a full orchestra score, to add lyrics and comments, create lead sheets, score 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.

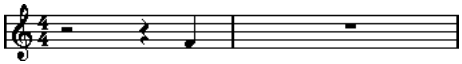
Do not think of the Score Editor as a drawing program, but rather as an “interpreter” of MIDI data.

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.

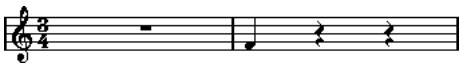
An example of the MIDI/score relationship

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:



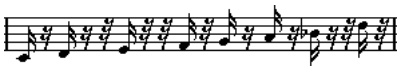
The same note in 3/4

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:



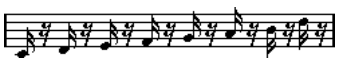
This does not look anything like what you intended. Let's start with the timing – obviously, you were off at a couple of places (the third, fourth and last note all seem to be a 32nd note late). You can solve this by quantizing the figure, but this would make the passage sound too "stiff", and not fit 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.

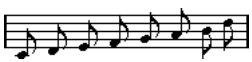
In the example above, the Display Quantize value seems to be set to 32nd notes (or a smaller note value).

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

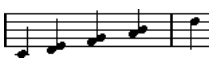
Now we have eighth notes, as we wanted. All we have to do now is to add staccato articulation which can be done with one simple mouse click using the Pencil tool (see the chapter "Working with symbols" on page 139) or using musical articulations (see the chapter "VST Expression" on page 62).

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:

⚠ 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)!

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

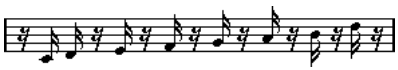
again, please note that when you hit Play, the passage still plays as it originally did. The Display Quantize setting only affects the score image of the recording. One last important note:

⚠ 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!

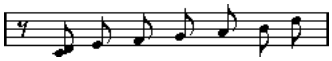
Using Rests as Display Quantize setting

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:

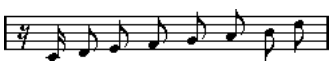


As you see, the first note appears one sixteenth note late. If we change the Display Quantize value for notes to eighth notes, the score is displayed like this:



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 (see “Inserting Display Quantize changes” on page 91), 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).

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, see “If your music contains mixed straight notes and triplets” on page 111.

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, see “Inserting Display Quantize changes” on page 91.

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 the chapter "Transcribing MIDI recordings" on page 88 you can find out how to make a recorded score as legible as possible without making any permanent changes to the MIDI data. The chapter "Entering and editing notes" on page 94 shows you how to enter and edit notes using the mouse. In real life, even if you have recorded the piece perfectly, you often have to do some permanent editing to your recording before printing.

⚠ In order to understand how to produce legible scores we recommend to read both chapters.

7

The basics

About this chapter

In this chapter you 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

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 into 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

How to open the Score Editor for a certain combination of tracks that you edited before is described in the section "Layout operations" on page 176.

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.

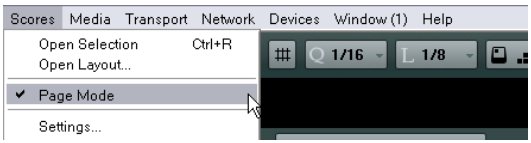
- Hold down [Alt]/[Option] and [Shift] and click anywhere in the score to move the project cursor there.
This is handy when the project cursor is not visible. This is not possible if Computer Keyboard Input mode is activated, see "Entering notes using the computer keyboard" on page 97.

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. See the chapter "The MIDI editors" in the Operation Manual for details.

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.

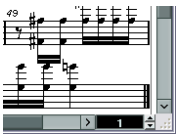
⚠ This section of the manual assumes you are in Page Mode. It is mentioned explicitly if something in this text specifically relates to Edit Mode.

Using the scroll bars in Page Mode

In Page Mode, the scroll bars 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.

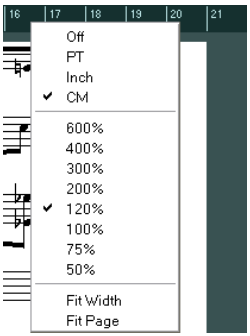
If you want to view and print a single part, without any surrounding empty bars, activate the “Unlock Layout when editing single parts” option in the Preferences dialog (Scores–Editing page). Note, however, that if you adjust the layout when editing the part in this mode, this erases the layout for the 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.

⇨ 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.

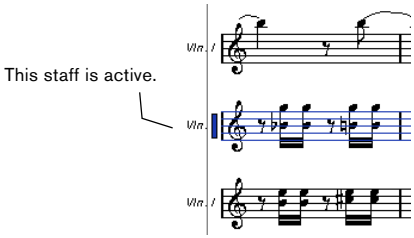
- Hold down a modifier key and right-click with the Zoom tool to open the Zoom context menu, and select the desired Zoom setting.

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.



⇨ 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.

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 with these, see the chapter “File Handling” in the Operation Manual.

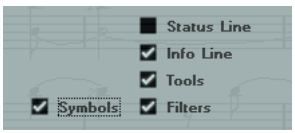
Designing your work space

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.

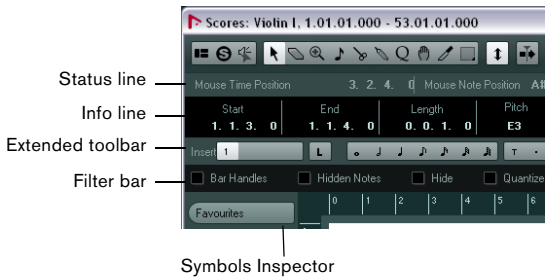
To configure the window layout, proceed as follows:

1. On the toolbar, click the “Set up Window Layout” button.

A transparent pane appears.



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 “invisible” 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:

Option	Description
Bar Handles	Displays the bar handles, used for copying bars (see “Moving and duplicating with the bar handles” on page 152).
Hidden Notes	Displays any notes you might have hidden (see “Hiding/showing objects” on page 185).
Hide	Displays markers in the score for each hidden element (except notes, see “Hiding/showing objects” on page 185).
Quantize	Displays markers in the score where you have made Display Quantize “exceptions” (see “Inserting Display Quantize changes” on page 91).
Layout tool	Displays markers in the score where you have made adjustments with the Layout tool (see “Graphic moving of notes” on page 135).
Grouping	Displays markers in the score where you have made beam groupings (see “Grouping” on page 129).
Cutflag	Displays markers in the score where you have inserted cutflag events (see “The Cut Notes tool” on page 134).
Split Rests	Displays markers in the score wherever you have split multiple rests (see “Splitting multi-rests” on page 187).
Stems/Beams	Displays markers in the score where you have made any stem or beam adjustments (see “Setting stem direction” on page 125 and “Manual adjustment of beams” on page 133).

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:

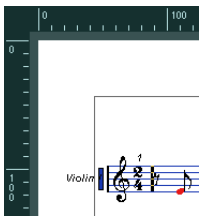
- Select “Toggle” to switch between a vertical or horizontal view of the palette.
- Select one of the options on the pop-up menu to bring up that palette (and replace the current palette).
- Hold down [Ctrl]/[Command] and select a palette from the pop-up menu to open the selected palette in a new window (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. For a detailed description, see “The Symbols Inspector Setup dialog” on page 141.

How to work with symbols is explained in detail in the chapter “Working with symbols” on page 139.

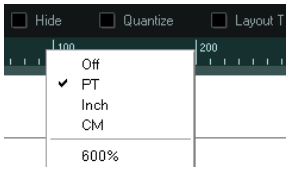
The ruler

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.

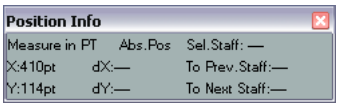
You can choose between points, inches, and centimeters.



- 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 hold [Alt]/[Option] and right-click on an empty area of the score, the context menu opens. It lists all available tools (allowing you to quickly switch between tools) and it contains many functions of the main menus.

Provided that the “Popup Toolbox on Right Click” option in the Preferences dialog (Editing–Tools page) is activated, a right-click holding a modifier key brings up the context menu.

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.

⇨ 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, see “Staff settings” on page 90.

Normally, all these symbols appear at the beginning of each staff. However, you can control this by using the Real Book option (see “Real Book” on page 184) and by hiding objects (see “Hiding/showing objects” on page 185).

When entering or editing keys, there is one important thing to note:

⚠ 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.

Using the Symbols Inspector to set the initial clef, key, and time signature

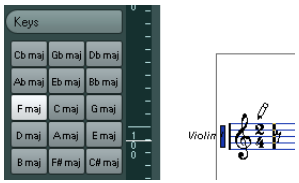
1. Click the “Set up Window Layout” button on the toolbar and activate the Symbols option.
The Symbols Inspector is displayed.

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.

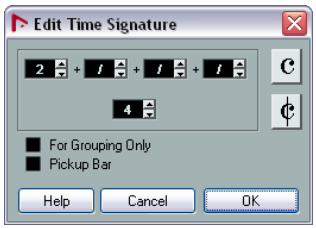


6. Open the Time Signatures tab of the Inspector and click on the symbol for the time signature value that you want to use.
If you cannot find the desired time signature, you can use the Edit Time Signature dialog (see below).

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

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.

▪ The “Pickup Bar” option is described in the section “By using the Pickup Bar feature” on page 188.

4. Click OK or press [Return].

⚠ All tracks share the time signature! In other words, when you set the time signature, you do this for all tracks in the project.

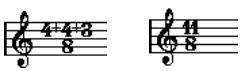
If you need to enter half a bar somewhere (for example) you have to make a time signature change (e.g. from 4/4 to 2/4 and back again). See “Inserting and editing clefs, keys, or time signatures” on page 106 to find out how to enter time signature changes.

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. For more information on beaming, see “Handling beaming” on page 129.

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.

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 (see the chapter “Working with the tempo track” in the Operation Manual).

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.

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.

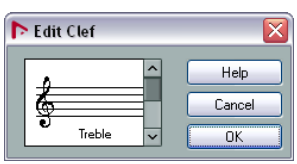
- Properties

If you select this function, the Edit Clef dialog opens.

In the Edit Clef dialog

1. Double-click on the current clef.

A dialog appears.



2. Use the scroll bar to select a clef.

⚠ This does not work if Auto Clef is activated on the Staff page of the Score Settings dialog, see below.

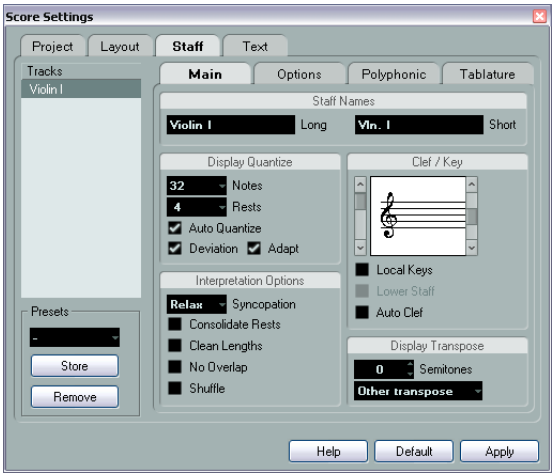
3. Repeat the steps above for all staves in the system.

On the Staff page of the Score Settings dialog

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 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 – see “Displaying single voices or the complete score” on page 76).



3. In the Clef/Key section, use the scroll bar on the left to select one of the available clefs.

How to insert clef changes is described in the section “Inserting and editing clefs, keys, or time signatures” on page 106.

4. Click Apply.

⇨ You can select another staff in the score and make settings for it without having to close the Score Settings dialog first.

In a split system

If you have a split system (see “Split (piano) staves” on page 104 and “Strategies: How many voices do I need?” on page 118) you can set different clefs for the upper and lower staff.

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.

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

⚠ 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 affects every staff in the project, so that it is not possible to define different keys for different staves (other than the relative display transpositions for transposing instruments as set up in their respective Staff Settings). Also from the Staff settings dialog, 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

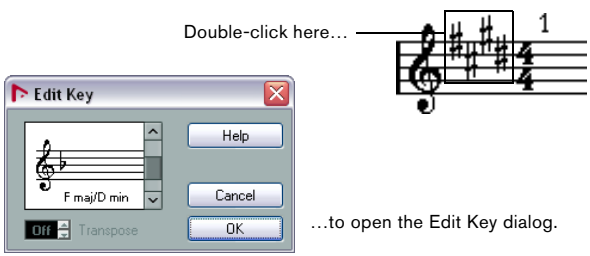
If you select this, the Edit Key dialog opens.

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:

1. Double-click on the accidentals at the beginning of a staff.

The "Edit Key" dialog opens.



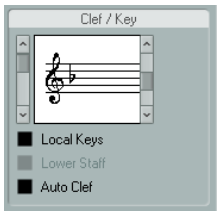
…to open the Edit Key dialog.

2. Use the scroll bar to select a key and click OK.

⇨ You can also enter a Display Transpose value, see "Transposing instruments" on page 85.

On the Staff page of the Score Settings dialog

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 scroll bar in the Clef/Key section to select the desired key.

3. Click Apply.

⇨ 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 (see "Split (piano) staves" on page 104 and "Strategies: How many voices do I need?" on page 118) you can set different keys for the upper and lower staff.

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.

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.

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.

⇨ 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 scroll bar 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

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.

⚠ 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 (see "Inserting and editing clefs, keys, or time signatures" on page 106). 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 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.

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.

Proceed as follows:

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.

⚠ 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:

1. Make sure that you are in Page Mode.

2. Select the Export tool ("Select Export Range").
The pointer turns into a crosshair.

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:

1. Make sure that you are in Page Mode.

2. Select the page that you want to export.

3. Pull down 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. 300dpi, 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 (on the main 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.

8

Transcribing MIDI recordings

About this chapter

In this chapter you 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. This is described in the chapter “Entering and editing notes” on page 94.

⚠ Before starting, make sure that you understand the basic principles behind the score notes/MIDI notes relationship and also what Display Quantize is, as described in the chapter “How the Score Editor works” on page 70.

Getting the parts ready

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.

Strategies: Preparing parts for score printout

Below follow a few tips that you might want to refer to 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 (see the chapter “Entering and editing notes” on page 94). 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 could 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, see “The Explode function” on page 92.

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, pull down 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), see “Displaying single voices or the complete score” on page 76.

- 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. For detailed information on the Staff Settings page, see the chapter “Staff settings” on page 108.

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, see the chapter “Polyphonic voicing” on page 115.

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 (see “No Overlap” on page 112) or polyphonic voicing (see “Polyphonic voicing” on page 115).
- 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, see “Syncopation” on page 111.

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, see “The Cut Notes tool” on page 134.

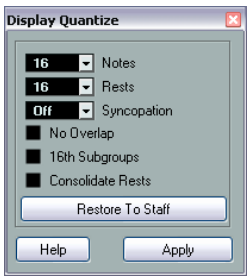
- If two notes on the same position are too close to each other or if you want their order in the part reversed, you can do this without affecting playback, see “Graphic moving of notes” on page 135.
- If a note has the wrong accidental, this can be changed, see “Accidentals and enharmonic shift” on page 126.
- Stem direction and length are automatic, but you can change them manually if you wish, see “Background: Note stems” on page 125.
- If you need a split staff (e.g. when you are scoring for piano), there are special techniques for this – see “Split (piano) staves” on page 104 and “Polyphonic voicing” on page 115.

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:

1. Select the Display Quantize tool on the toolbar or context menu.
The Display Quantize dialog opens.

Select the Display Quantize tool…

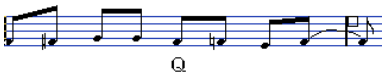


…to open the Display Quantize dialog.

2. Activate the flags you need and set the quantize values as desired.
For details, see “Display Quantize and Interpretation Options” on page 110. Additional hints below.

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 (see “The status line” on page 79). 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.
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.

- If you are using polyphonic voices (see “Polyphonic voicing” on page 115), 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.

Viewing and editing Display Quantize changes

If you activate the “Quantize” checkbox on the filter bar (see “Showing and hiding “invisible” elements” on page 79), 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.

Strategies: 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. See "If your music contains mixed straight notes and triplets" on page 111 for details.

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 – this is described in the section "Automatically – the Explode function" on page 120.

⚠ Create a copy of the original track first, because it will be changed by the operation.

1. Pull down 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.
A number of new tracks are now added to the score and the Project window.

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.

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 (see "Hiding/showing objects" on page 185).

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.

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.

9

Entering and editing notes

About this chapter

In this chapter you 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 in addition to those described in the chapter "The basics" on page 75. To understand why and how these settings and the note data in the score interact, please read the chapter "How the Score Editor works" on page 70.

There are three ways to open the Score Settings dialog:

- Make the staff active, pull down 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), see "Displaying single voices or the complete score" on page 76.

- 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. For detailed information on the Staff Settings dialog, see the chapter "Staff settings" on page 108.

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).

⇨ 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 (see "Working with staff presets" on page 109).

⇨ 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.

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:

Option	Description
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 (for split staves, see "Split (piano) staves" on page 104)
Tablature tab settings	Tablature Mode deactivated

⇨ 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. Please read "How the Score Editor works" on page 70. If you have mixed triplets and straight notes, see "Display Quantize and Interpretation Options" on page 110.

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

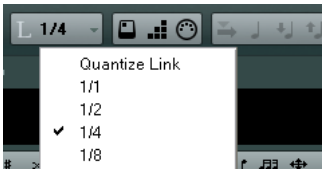
You can choose the length for entering notes as follows:

- 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 (see “Changing the length of notes” on page 103), by gluing notes together (see “Lengthening a note by gluing two notes together” on page 104) or by using the Display Length feature.

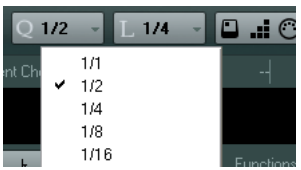
Selecting a Quantize value

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 in the Quantize Type 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 Setup dialog to create other Quantize values, irregular grids, etc.

However, this is not often used when inputting score notes.

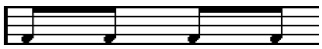
The mouse position info

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.

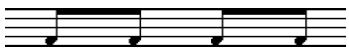
The Mouse Note Position display shows the pitch according to the vertical position of the pointer in a staff. The Mouse Time Position display shows the "musical position" in bars, beats, sixteenth notes, and ticks:

- 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:

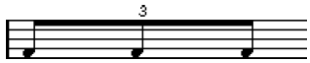


2/2	1.1.1.0	1.1.3.0	1.1.5.0	1.1.7.0
4/4	1.1.1.0	1.1.3.0	1.2.1.0	1.2.3.0
8/8	1.1.1.0	1.2.1.0	1.3.1.0	1.4.1.0

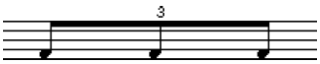


2/2	1.2.1.0	1.2.3.0	1.2.5.0	1.2.7.0
4/4	1.3.1.0	1.3.3.0	1.4.1.0	1.4.3.0
8/8	1.5.1.0	1.6.1.0	1.7.1.0	1.8.1.0

Eighth note positions

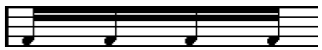


2/2	1.1.1.0	1.1.2.40	1.1.3.80
4/4	1.1.1.0	1.1.2.40	1.1.3.80
8/8	1.1.1.0	1.1.2.40	1.2.1.80



2/2	1.1.5.0	1.1.6.40	1.1.7.80
4/4	1.2.1.0	1.2.2.40	1.2.3.80
8/8	1.3.1.0	1.3.2.40	1.4.1.80

Eighth note triplet positions



2/2	1.1.1.0	1.1.2.0	1.1.3.0	1.1.4.0
4/4	1.1.1.0	1.1.2.0	1.1.3.0	1.1.4.0
8/8	1.1.1.0	1.1.2.0	1.2.1.0	1.2.2.0

2/2	1.1.5.0	1.1.6.0	1.1.7.0	1.1.8.0
4/4	1.2.1.0	1.2.2.0	1.2.3.0	1.2.4.0
8/8	1.3.1.0	1.3.2.0	1.4.1.0	1.4.2.0

Sixteenth note positions

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:

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:

1. Make the staff active.
Notes are always inserted on the active staff, see "The active staff" on page 78.

2. Select the desired note value.
See "Selecting a note value for input" on page 96.

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.

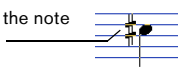
4. Select a Quantize value.
The Quantize value determines the spacing between notes. If you set Quantize to 1/1 you only can add notes at downbeats. If you set Quantize to 1/8, you can add notes at eighth note positions, etc.

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.



⇨ 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're 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.

⚠ 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.

Adding more notes

1. If you want the next note to have a different length value, select the corresponding note symbol.

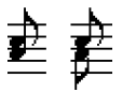
2. If you need finer positioning, or if the current value is too fine, change the Quantize value.

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

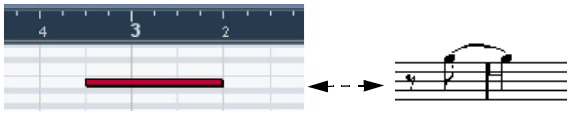
The notes may not always appear in the score as you initially expect them to. This is because there are a number of situations that require special techniques and settings. Below you can find a list of some of these and where to find more information about handling them:

- 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 – see "Polyphonic voicing" on page 115.



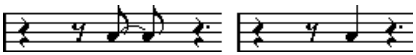
Without and with polyphonic voicing

- 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 (see "No Overlap" on page 112) or polyphonic voicing (see "Polyphonic voicing" on page 115).
- 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, see "Syncopation" on page 111.



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. See "Accidentals and enharmonic shift" on page 126 for details.
- 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, see "Graphic moving of notes" on page 135.
- Stem direction and length is normally automatic, but you can set it yourself, see "Background: Note stems" on page 125.
- If you are scoring for piano and therefore (or for other reasons) need a split staff, there are special techniques for this, see "Split (piano) staves" on page 104 and "Polyphonic voicing" on page 115.

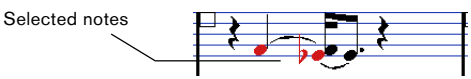
Selecting notes

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 turns red to indicate that it is selected.

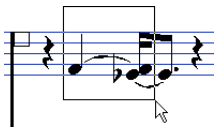
- To select more notes, hold down [Shift] and click on them.



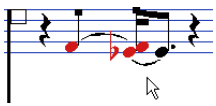
- To deselect notes, hold down [Shift] and click on them again.
- If you hold down [Shift] and double-click on a note, this note and all the following notes in the same staff are selected.

Using a selection rectangle

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.

⚠ 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

Proceed as follows:

1. Set the Quantize value.
The Quantize value restricts your movement in time. You cannot place notes on positions smaller than the Quantize value (see “Selecting a Quantize value” on page 96).

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.

⇨ 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’re 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.

Moving by using key commands

Instead of dragging the note with the mouse, you can assign key commands for this:

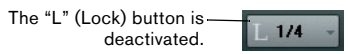
- The corresponding commands can be found in the Nudge category in the Key Commands dialog. They are listed as “Left”, “Right”, “Top”, and “Bottom”.
- When moving notes to the left or right using key commands, the notes are moved in steps according to the Quantize value.
The keys assigned for up/down 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. Proceed as follows:

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.



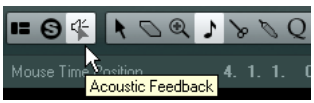
3. Click on one of the notes and drag them to the new system.
The active staff rectangle indicates on which staff the dragged note(s) appears.

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



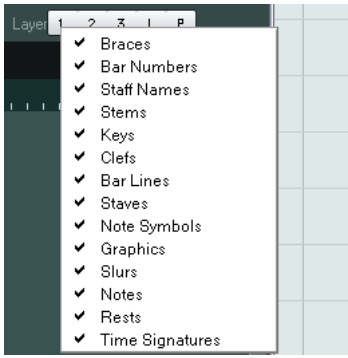
To hear the pitch of the note while moving, activate the speaker icon (Acoustic Feedback) on the toolbar.

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 lit). You can only select or move objects whose Layer button is activated. For more detailed information, see “Using the lock layers” on page 149.

⇨ 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 (see “Background: The different layers” on page 140).

Duplicating notes

To duplicate notes in the score, proceed as follows:

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, see “The Snap mode” on page 101.
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”).

⇨ You can also move or copy whole bars by dragging the bar handles, see “Moving and duplicating with the bar handles” on page 152.

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.

⚠ 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.

Notes that you have put on the clipboard by cutting or copying can be inserted into the score again as follows:

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 (see “Moving across staves – the Lock button” on page 100).

▪ 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.

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.
The commands are listed as “Top” (transpose one semitone up) and “Bottom” (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, see the chapter “The Project window” in the Operation Manual.

▪ 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.

Via MIDI

Proceed as follows:

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, as described in the chapter “The MIDI editors” in the Operation Manual.

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.

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.

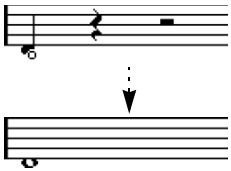
⚠ Remember that the appearance of notes and rests in the score is determined by the Display Quantize settings on the Staff page of the Score Settings dialog. Depending on the Notes and Rests values, notes may be displayed as if they were longer than they really are (see “Display Quantize” on page 72).

By using the Insert Note tool

Proceed as follows:

1. Select the note symbol with the desired note value on the extended toolbar.

2. Hold down [Alt]/[Option] and click on the note(s) that you want to set to this length.



By using the extended toolbar

Using the extended toolbar is another quick way to set a number of notes to the same length:

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 (see “Using the info line” on page 102).

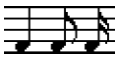
Lengthening a note by gluing two notes together

You can create unusual note length values by gluing notes of the same pitch together.

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.

⚠ 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

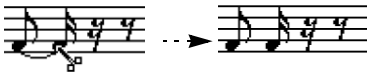
If you want to change the displayed length of notes without affecting how they play back, the first thing to try is to adjust Display Quantize, either for the whole staff or for a separate section, using the Display Quantize tool (see "Inserting Display Quantize changes" on page 91).

But you can also make display length adjustments to individual notes in the Set Note Info dialog:

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!

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

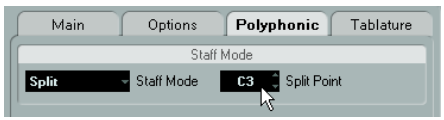
There are instances when you want different staff settings for different sections of the track. The settings on the Staff page of the Score Settings dialog are valid for the entire track, but by using the Display Quantize tool you are able to insert changes and exceptions wherever you like. This is described in detail in the section "Inserting Display Quantize changes" on page 91.

Split (piano) staves

Setting up the split staff

Proceed as follows:

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 Splitpoint 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.

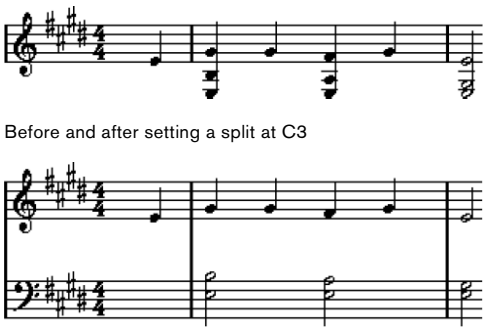


Split mode selected.

- 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, see "Setting clef, key, and time signature" on page 81).

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

Changing the splitpoint

Proceed as follows:

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 Splitpoint value.
5. Click Apply.

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, see “Working with staff presets” on page 109 for details.

Selecting notes

You can select notes from one or several staves at the same time, using any of the selection methods, see “Selecting notes” on page 99.

Adding notes

This is done just as on a single system, see “Adding and editing notes” on page 97. 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 Splitpoint setting always decides if a note goes on the upper or lower staff. If you change the splitpoint, this affects existing notes, see below.
- Sometimes a fixed splitpoint 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, see “Polyphonic voicing” on page 115.
- 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 as described in the section “Editing pitches of individual notes” on page 102.

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

Proceed as follows:

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 (see also “About the Pencil tool” on page 143).

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.

⚠ 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.

Inserting a symbol on all staves

If you hold down [Alt]/[Option] when you insert a symbol with the Pencil 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.

⇨ If some of the staves are bracketed (straight brackets only, as set up in the Score Settings dialog on the Layout page, see “Adding brackets and braces” on page 192), inserting a symbol for one of these staves inserts it for all other staves within the bracket. Staves outside the bracket are not affected.

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.

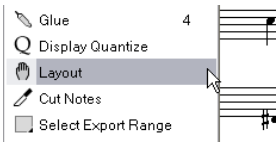
- In the Score Settings dialog on the Project page (Notation subpage), you can find several options for how clef, key, and time signature changes are displayed.
You can also adjust the automatic spacing between these symbols in the Spacings subpage. See the dialog help for details.

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:

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.
Now the clef is moved, but the score is still interpreted as if it remained in its original position.

⇨ 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”.

⇨ 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

Proceed as follows:

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

Proceed as follows:

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.

10

Staff settings

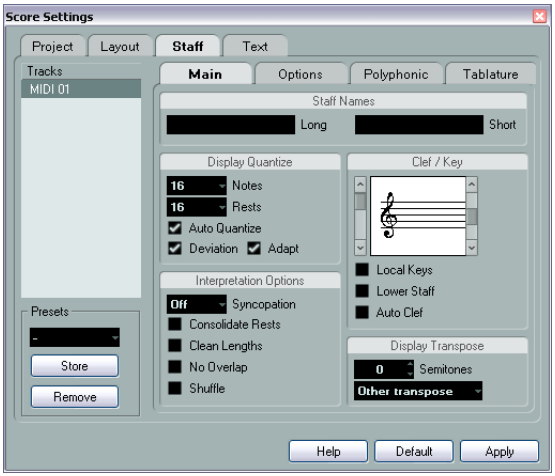
About this chapter

In this chapter you 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

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.

⇨ 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!

⚠ Staff settings can be saved in the track presets. For more information, see the chapter "Working with track presets" in the Operation Manual.

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 store 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

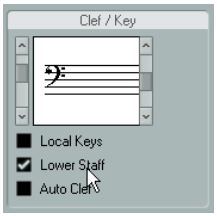
The staff presets are stored as individual files in the Presets–Staff Presets folder within the Nuendo program folder. The presets are available for selection in any project you create or edit.

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 (see “Staff names” on page 173).
- 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 Track Names to Left of staff” is activated in the Score Settings dialog, on the Project–Notation Style subpage (Staff Names category).

Key and clef



The basic key and clef settings are described in detail in the section “Setting clef, key, and time signature” on page 81. There is also a Lower Staff checkbox which is only used in conjunction with split (piano) staves and polyphonic voicing (see “In a split system” on page 83).

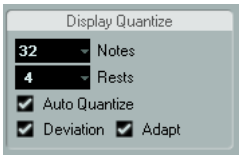
- If you want to set a different key symbol, e.g. when scoring for french horn, activate the “Local Keys” option.

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 – for further details, see “Strategies: Adding Display Quantize changes” on page 92.

There are “fixed” Display Quantize values plus an “Auto” option which should only be used when your music contains mixed straight notes and triplets. For background information about Display Quantize, see “Display Quantize” on page 72.

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

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.

See “Inserting Display Quantize changes” on page 91.

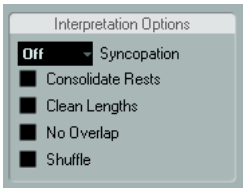
If your music contains mixed straight notes and triplets

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

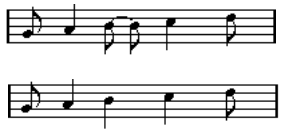


Syncopation

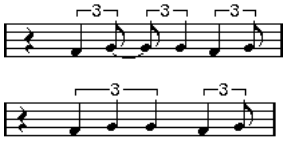
Activate Syncopation when the program adds more ties to notes crossing beats and bar lines than you prefer. The following options are available:

Option	Description
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:

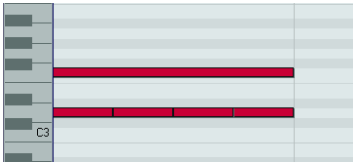
- If a note is too short, you may get a rest just after it.
- When Clean Lengths is activated, the rest disappears.

A slightly short eighth note without and with “Clean Lengths”.

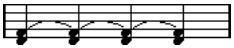
If using Clean Lengths does not help in a particular situation, you can manually resize the offending note(s) or use the Display Quantize tool (see “Inserting Display Quantize changes” on page 91).

No Overlap

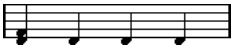
When notes starting at the same position have different lengths, the program tends to add more ties than you may want. This can be avoided by using No Overlap.



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.

⚠ 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 voices, see “Polyphonic voicing” on page 115.

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.

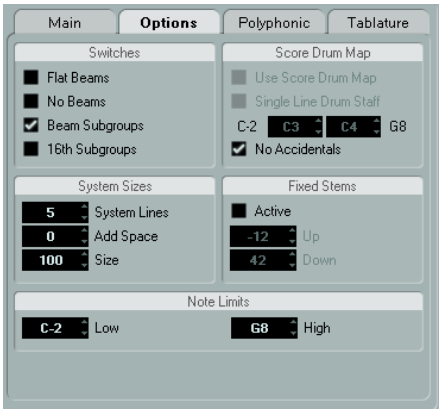
⇨ The Display Transpose setting does not affect playback or the actual pitch of the notes – it only changes how they are displayed and printed.

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/Clef dialog (see "Display Transpose in the Edit Key dialog" on page 85).

- 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 (see "Chord Symbols" on page 164).
- You can disable Display Transpose by deactivating the "Display Transpose" button on the toolbar of the Score Editor.

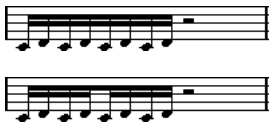
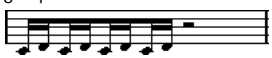
For more information, see "Transposing instruments" on page 85.

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

Option	Description
Flat Beams	Activate this when you want the beams over notes to be flat (as opposed to slanted), see "Beam appearance and slant settings" on page 132.
No Beams	Activate this when you do not want any beaming at all on the staff (for example for vocal scoring), see "Turning beaming on/off" on page 129.
Beam Subgroups	Use this when you want sixteenth notes displayed under a beam to be divided into groups of four notes, see "Handling beam groups" on page 132.  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.

System Sizes

This section allows you to set the number of system lines and to control spacing between the lines:

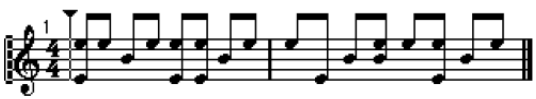
Option	Description
System Lines	The number of lines in a system. For regular scoring, this should be set to 5.
Add Space	Allows you to increase or decrease the space between the lines in a system.
Size	Allows you to set a size for the systems, as a percentage (with 100% being the default value). In effect, this setting scales the score vertically.

Score Drum Map

These settings are described in the chapter “Scoring for drums” on page 196.

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 (see “Setting up a staff for drum scoring” on page 199).



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.

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.

⇨ 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). These settings are described in the chapter “Polyphonic voicing” on page 115.

The Tablature tab

This tab contains settings for creating tablature scores. The settings are described in the chapter “Creating tablature” on page 200.

11

Polyphonic voicing

About this chapter

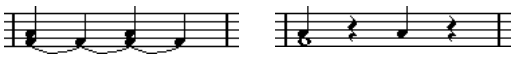
In this chapter you learn:

- 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

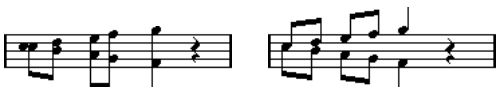
Polyphonic voicing allows you to resolve a number of situations impossible to score properly otherwise:

- Notes starting at the same position, but with different lengths. Without polyphonic voicing you get unnecessary amounts of ties.



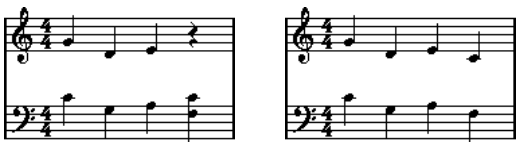
Without and with polyphonic voicing

- 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 splitpoint 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.

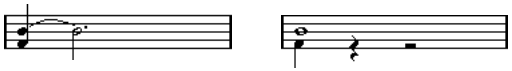
The second thing you do is to move or enter notes into the voices. If you have a recording done already, the program can do much of this work for you, automatically. You might then want to fine tune by moving one or more notes into another voice, or you might want to add notes to a certain voice. See “Adding and editing notes” on page 97 for details.

⚠ Each voice is polyphonic. In other words, one voice can contain chords.

Overlapping notes

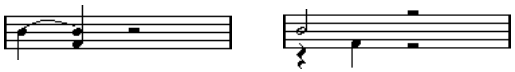
Throughout this chapter you encounter the term “overlapping notes”. Two notes are considered overlapping when they are on the same staff and:

- 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:

⇨ 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.

⇨ 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:

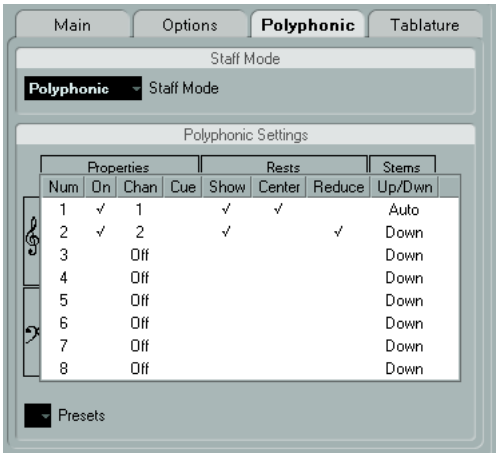
1. Make sure that the desired staff is active.

2. Open the Score Settings dialog and select the Staff page.

3. Select the Polyphonic tab.

4. Pull down 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.



⚠ 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.

⚠ 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, see "Cue notes" on page 135.

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, see "Flipping the stem of one or several notes" on page 125.

⚠ 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, see "Automatically – the Explode function" on page 120.

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

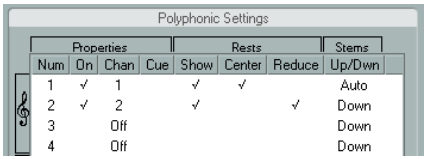
The Presets pop-up menu on the Polyphonic tab (below the list of voices) contains three very useful setups. Instead of making settings by hand, you can select one of the presets, saving some time. The presets are:

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?

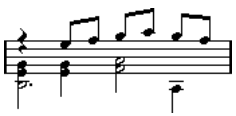
Well, it depends…

- 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 (see "Overlapping notes" on page 116), 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.



Entering notes into voices

When you add new notes, you need to decide which voice they go into:

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.

Here, three voices are available on the upper staff.

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, see "Adding and editing notes" on page 97.
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.

Symbols and voices

Later in this manual you learn about symbols that can be added to the score. Many of these symbols must also be put into a particular voice, see "Important! – Symbols, staves, and voices" on page 142.

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.

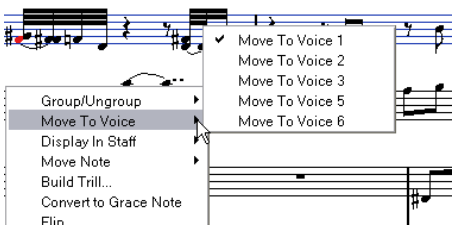
This can be used as a quick way to check which notes belong to the same voice as some other note.

Moving notes between voices

Manually

To manually move notes to another voice, proceed as follows:

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 (see "The Explode function" on page 92) or into polyphonic voices:

1. Pull down 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.

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 (see the chapter "The Logical Editor, Transformer and Input Transformer" in the Operation Manual) 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 (see "Automatic polyphonic voicing – Merge All Staves" on page 123).
- When you have assigned parts to voices, you can use the Extract Voices function to create one track out of each voice (see "Converting voices to tracks – Extract Voices" on page 123).

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 (see "Hiding/showing objects" on page 185) 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.

Voices and Display Quantize

When you insert Display Quantize changes (see "Inserting Display Quantize changes" on page 91), you can either apply the settings to all voices (by [Alt]/[Option]-clicking with the tool) or to the current voice only.

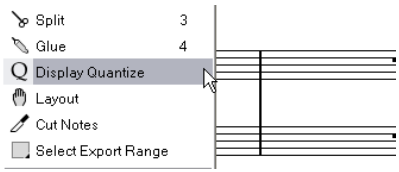
⚠ If "Display Quantize tool affects all Voices" is activated in the Score Settings dialog on the Project–Notation Style subpage (Miscellaneous category), the Display Quantize settings always affects all voices (even if you do not press [Alt]/[Option] and click).

Making Display Quantize settings for one single voice allows you to do two things:

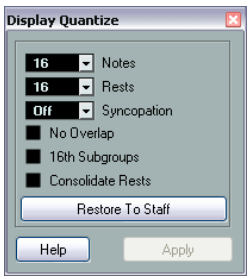
- Make each voice have its own Display Quantize settings by inserting a Display Quantize event for each voice, at the beginning of the staff. This is valid for the entire staff, until another Display Quantize event is inserted.
- Insert Display Quantize "exceptions" anywhere in the score, independently for each voice.

Proceed as follows:

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.



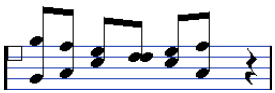
4. Click at the position at which you want to insert the event.
   The Display Quantize dialog appears.



5. Fill out the dialog as described in the section "Display Quantize and Interpretation Options" on page 110.
6. Click Apply.

Creating crossed voicings

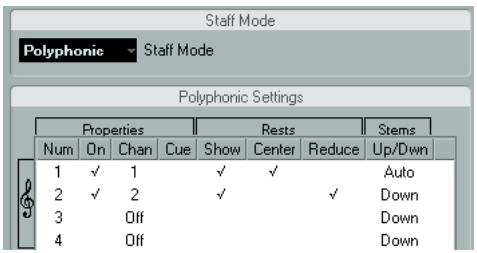
Often, for example in vocal scoring, you have crossed voicings on one system. You can of course move notes manually into voices to get the stem direction and other note properties right, but there is a quicker way. Let's explain how to do this by example. Without using polyphonic voicing, you have entered this:



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.



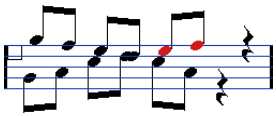
4. Click Apply.
The staff is in Polyphonic staff mode, but all notes are still in the same voice.

5. Pull down 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.

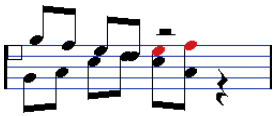
7. Click OK.
The notes have now been split in two "lines", each in a separate voice. However, from the middle of the bar, notes that are in voice 1 should be in voice 2 and vice versa.

8. Select the two notes that you want to be moved from voice 1 to voice 2.



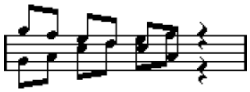
Two notes in voice 1 selected.

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.



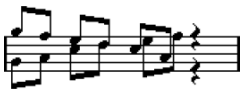
Two notes moved to the right voice.

10. Select the two notes that you want to be moved to voice 1 and move them, too.



All notes in the right voices.

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 (see "Graphic moving of notes" on page 135) and the display of stems and beams for some of the notes (see "Manual adjustment of beams" on page 133). When you have made those adjustments, the score may look like this:



After making graphical adjustments.

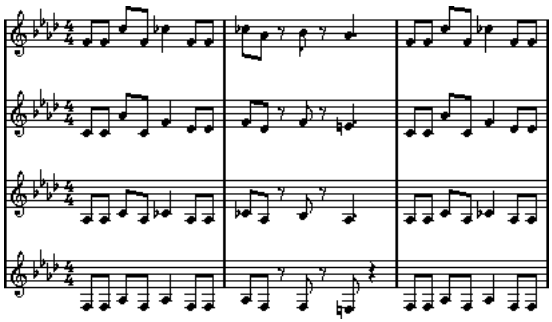
Automatic polyphonic voicing – Merge All Staves

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:

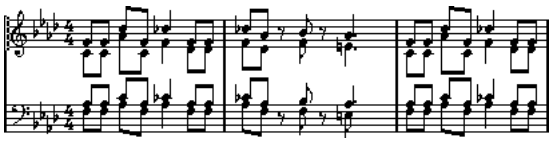
1. Open the tracks (up to four) in the Score Editor.

2. Pull down 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.

⚠ When you later play back the music, you need to mute the four original tracks, or you get double notes.

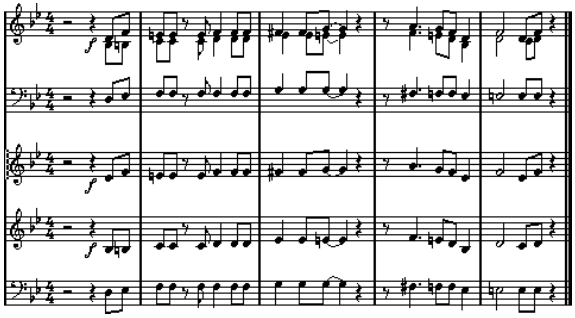
Converting voices to tracks – Extract Voices

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. Proceed as follows:

1. Open a track containing 2 to 8 polyphonic voices in the Score Editor.

2. Pull down 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.



⚠ When you later play back the music, you need to mute the original track (the one with polyphonic voices), or you get double notes.

12

Additional note and rest formatting

About this chapter

In this chapter you 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).

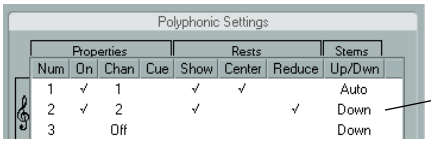
The order of this list corresponds to the priority of the settings, i.e. on conflict, the grouping under beams has the highest priority and the settings made on the Polyphonic tab the lowest.

⚠ If you have edited the stem length of a note and then flip it, the stem is reset to default length.

⚠ If you have activated the “Fixed Stems” option on the Staff page of the Score Settings dialog (Options tab, see “Fixed Stems” on page 114), a lot of the automatic stem length settings are ignored. However, you can still edit the stem length and direction of individual notes.

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

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.

- You can also assign a key command for this.

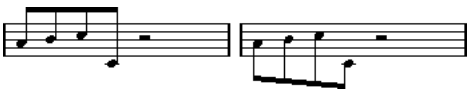
In the Key Commands dialog on the File menu, the command is called “Flip” and is found in the Score Functions category.

- 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

1. Select any note in the group.
2. Invoke Flip as described above.

The entire group is now flipped.

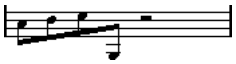


Before and after the flip. No matter which note you select, the entire group is flipped.

⚠ This does not work if you have adjusted the slanting of the beam by dragging. If you have, you must first reset the beam as described in the section “Stem length” on page 126.

Independent stem direction under a beam

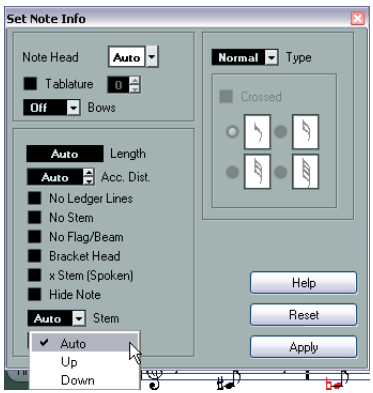
If you need stems attached to the same beam to go in different directions, this is achieved by dragging the beam's start and end points, as described in the section "Manual adjustment of beams" on page 133. This feature is available in Page Mode only.



Independent stem direction under a beam

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, see "Using Flip Stems" on page 125.
- Setting this pop-up menu to Auto makes the program set the stem direction automatically.

Stem length

Adjusting stem length (Page Mode)

1. Click on the end of the stem so that a handle appears.

The stem handle is selected.

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

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.

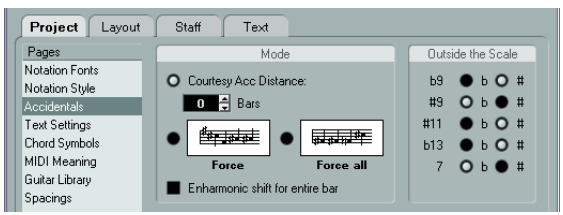
Before and after deleting the "Stem" item.

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:

1. Open the Score Settings dialog on the Project page and select the Accidentals subpage from the list displayed on the left.



Now, you have the following possibilities:

- 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 by clicking on the graphics:

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. With the radio buttons to the right, you can decide how five of the most common intervals outside the scale are displayed, as sharps or as flats.

⚠ 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).

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.

1. Select the notes to be shifted.

2. Click the desired option on the extended toolbar.

Option	Description
	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”.

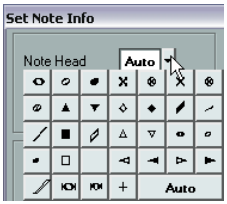
3. If you want the enharmonic shift to be repeated in the whole bar, activate the “Enharmonic shift for entire bar” option in the Score Settings dialog (Project–Accidentals subpage).

Changing the note head shape

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. Pull down 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.

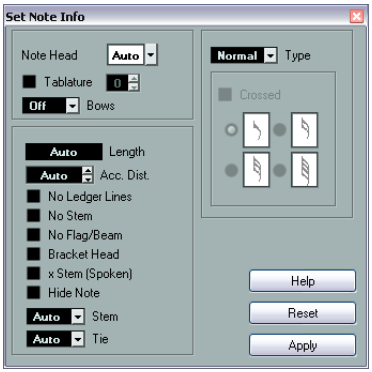
5. Click Apply.
The settings are applied to the selected notes.

6. If you like, select other notes and make settings for them.

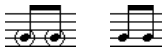
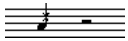
7. When you are done, close the dialog.

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:

Option	Description
Note Head	Used for selecting custom note head shapes (see "Changing the note head shape" on page 127).
Tablature on/off and number	Used for creating or editing tablature (see "Creating tablature" on page 200). This feature can be used for individual notes or together with the automatic tablature function.
Bows pop-up menu	Used for adding bow up/bow down articulation. When selecting "Off", bow symbols are not displayed for the selected notes.  Bow up and down
Display Length	This allows you to change the displayed length of notes, without affecting playback. Note that the display quantize settings still apply (see "Display Quantize values" on page 111). 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 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 pop-up menu	Determines the stem direction, see "Using Flip Stems" on page 125.
Tie pop-up menu	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 pop-up menu	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. This is described in detail on "Grace notes" on page 136. – Cue. When this is selected, notes are displayed as cue notes (smaller notes, often used as "guide notes" or optional lines). See "Cue notes" on page 135 for details. – 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" (see "The Cut Notes tool" on page 134). 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, see "Grace notes" on page 136.

Coloring notes

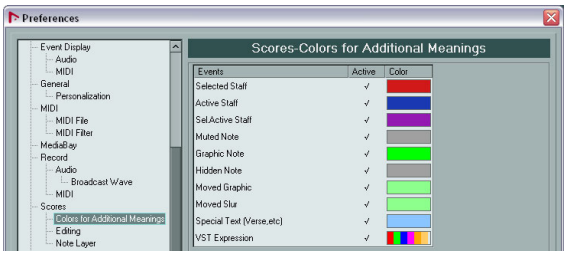
You can assign colors to notes using the Event Colors pop-up menu on the toolbar.

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.

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 (see "Moving note symbols" on page 153).

1. Open the Preferences dialog (Scores–Use 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).

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:

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. – see "Adding note symbols" on page 143).

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 Note 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.

Handling beaming

Turning beaming on/off

Beaming is enabled/disabled independently for each staff.

1. 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

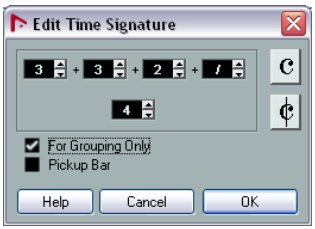
The time signature for the score naturally affects grouping. But you can control this yourself by creating a composite time signature used only for grouping:

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.

⚠ 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:

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

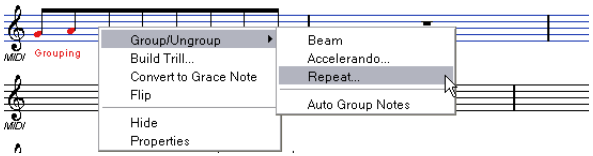
To show Repeats for the grouped notes, proceed as follows:

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!

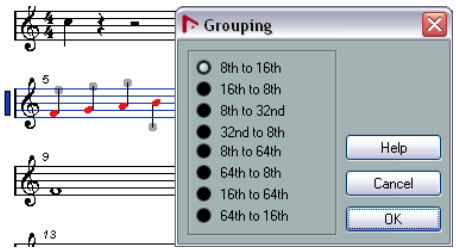
6. Click OK to close the dialog.

▪ Double-clicking on the “Grouping” text opens the Grouping dialog, allowing you to adjust the “note value” for the symbols.

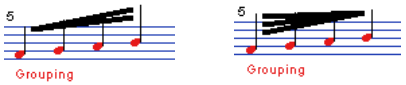
Creating an accelerando/ritardando

To create an accelerando/ritardando, proceed as follows:

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

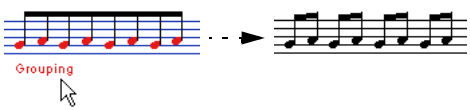
As described above, the Grouping dialog can also be opened by double-clicking an existing grouping text in the score.

▪ 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:

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.

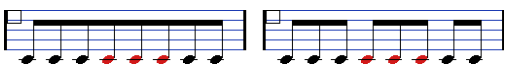


▪ If you need to remove all groups from the score, hold down [Shift] and double-click on the first “Grouping” text.
This selects all “Grouping” symbols, so you can delete them all at once by pressing [Backspace] or [Delete].

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.



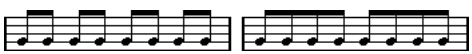
Before and after grouping

Automatic grouping

The program can also go through the selected notes and automatically create grouping for you, where it is deemed suitable. Proceed as follows:

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.
In 4/4 you get for example two groups of eighth notes per bar, in 3/4 you get one group per bar, etc.



Before and after using auto grouping in 4/4

Cross-staff beaming

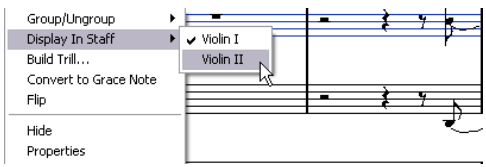
To create a beam that extends from one staff to another, proceed as follows:

1. Set up a split or polyphonic voicing system or open the Score Editor with more than one track.

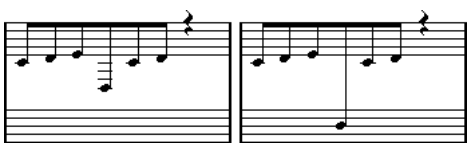
2. Set up a beam of notes (using the group command) and adjust their pitches so that they are correct even though some of the notes are on the wrong staff.
Use the info line to edit the pitches if they are very low or high.

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.

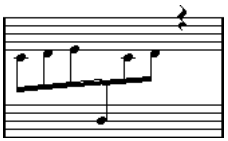


The notes are “graphically” moved to the selected system, but keep their actual pitch.



Before and after moving a note to the lower staff

5. If needed, adjust the beam appearance (see “Manual adjustment of beams” on page 133).

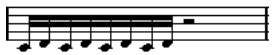


Cross-staff beaming with the beam in the middle

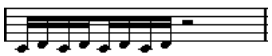
This does not move the affected notes to another track, but merely displays them as if they belonged to the other staff.

Handling beam groups

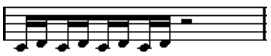
There are two settings for groups under a beam, Beam Subgroups and 16th Subgroups, both found on the Options tab on the Staff page of the Score Settings dialog. If “Beam Subgroups” is activated, the program displays subgroups after four sixteenth notes under a beam. If you also activate “16th Subgroups”, subgroups appear after only two sixteenths.



Beam Subgroups off



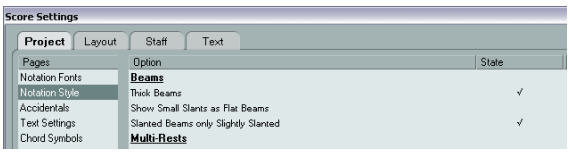
Beam Subgroups on



On with 16th Subgroups activated

Beam appearance and slant settings

Global settings

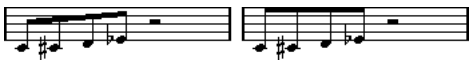


In the Score Settings dialog, on the Project page (Notation Style subpage), you can find the following three options for beam appearance in the Beams category:

- Thick Beams.
Activate this if you want beams to be displayed as thick lines.

- Show Small Slants as Flat Beams.

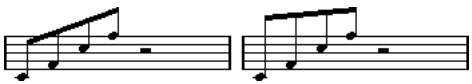
When this is activated, beams that would be only slightly slanted are displayed flat.



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”

⚠ 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:

Option	Description
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.

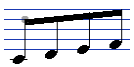
Manual adjustment of beams

For very detailed control you can manually adjust the beam slant:

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.

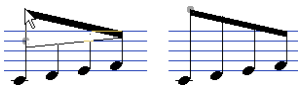
A handle appears on the corner of beam and stem.



A beam handle

3. Drag the handle up or down.

The slant of the beam changes.

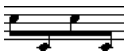


Dragging a handle and the effect it has.

⇨ 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:



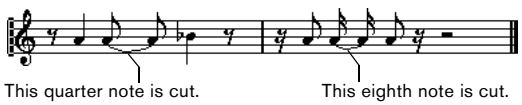
Putting the beam between the notes.

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:



However, this is not always what you want. There are three ways to affect the cutting mechanism:

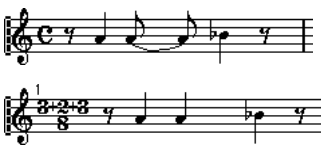
Syncopation

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 (see "Inserting Display Quantize changes" on page 91).

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 – see "Grouping" on page 129.



With a regular 4/4 time signature

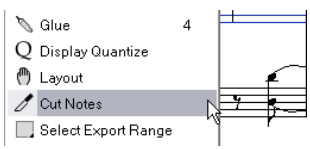
With a composite time signature (3+2+3 eighth notes)

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.

Proceed as follows:

1. Select the Cut Notes tool.

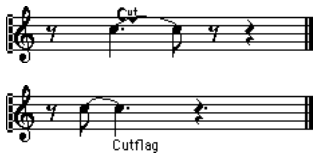


2. Set the Quantize Type pop-up menu to an appropriate value.
As usual, this determines where you can click.

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

As described in the section "Tie pop-up menu" on page 128, you can set the direction of the tie manually in the Set Note Info dialog.

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

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.

The following modes are available:

Mode	Description
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.

3. Click on the note and drag it to the desired position.

Note that movement is restricted to horizontally only.

⇨ 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.

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, Right, Bottom and Top (only the Graphical Left and 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

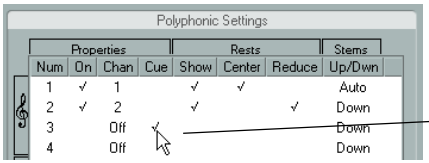
1. Open the Score Settings dialog on the Staff page and select the Polyphonic tab.

This is described in the section “Setting up the voices” on page 117.

2. Click in the “Cue” column for the voice, so that a checkmark appears.

3. Decide how to handle rests for the voice.

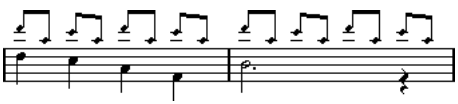
You might for example leave “Rests–Show” activated and activate “Reduce”. If you do, you get rests in this voice, but not as many as otherwise. Empty bars, for example, do not have any rests at all.



4. Close the dialog.

5. Move the notes into the cue voice.

Polyphonic voicing is described in detail on “Polyphonic voicing” on page 115.



An example of a cue note voice

A quick example

Let’s say you have a flute part and want some cue notes for it:

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

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.

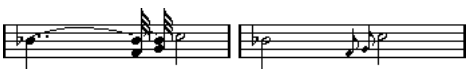
4. Click Apply.

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 no longer "interfere" with the interpretation of the other notes.

⚠ 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 note are hidden!

Creating grace notes manually

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

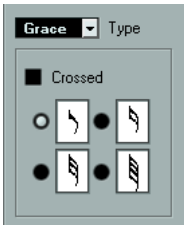
If two grace notes are at exactly the same position (the same tick), they are put onto the same stem, as a chord. If multiple grace notes in front of the same note are put on different positions (even if they are only one tick apart), they are grouped under a beam.

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

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

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.

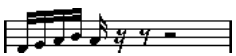
There are two methods for creating tuplets:

- 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.

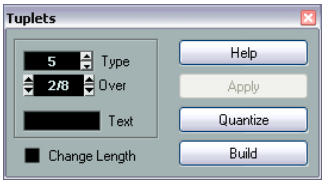
With permanent change to MIDI data

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.

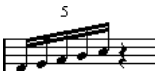


Five sixteenth notes, about to be converted to a quintuplet.

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 (see “Tuplet display options” on page 138) 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.

Without permanent change to MIDI data

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.

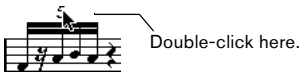
4. Click Quantize.
Now the tuplet is displayed correctly. You can make additional settings for how the tuplet should appear, as described below.

5. If necessary, adjust the notes.

⚠ Lengths and positions in a tuplet group are probably best edited using the info line.

Editing tuplet settings

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, see “Grouping” on page 129 for details.

Tuplet display options

In the Score Settings dialog, on the Project–Notation Style subpage (Tuplets category), you can find the following settings for tuplets:

Option	Description
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).

13

Working with symbols

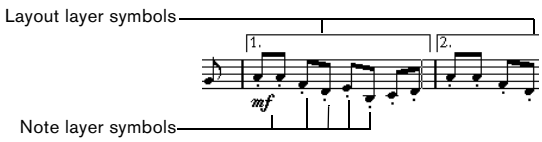
About this chapter

In this chapter you 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 repeats, rehearsal marks, some types of text, etc. – can be put either in the layout layer (which is individual for each layout) or in the project layer (common for all layouts).



Note layer symbols

Let's look at the note layer symbols first. These come in three flavors:

- 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 (see "Grace notes" on page 136). 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 (see "Setting the number of bars across the page" on page 189), this affects the symbols positions.

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.

For a detailed description of the layout layer, see the chapter "Working with layouts" on page 175.

Project layer symbols

Project layer symbols are layout symbols that are present in all layouts. The project layer holds the symbols found in the Project tab, plus bar line types and bar number offsets.

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. This is described in the chapter "Working with layouts" on page 175.
- 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.

Which symbols are part of which layer is described in the section "The available symbols" on page 142 and onwards.

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.

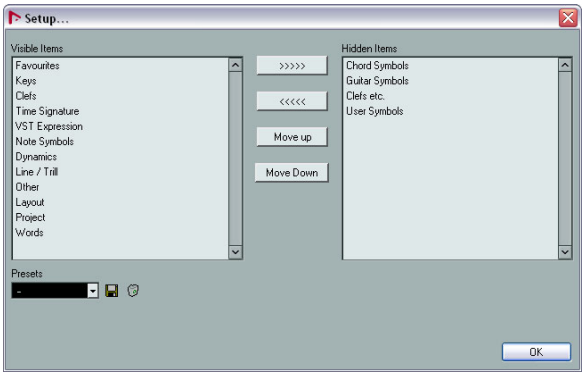
Showing/Hiding Symbols Inspector tabs

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

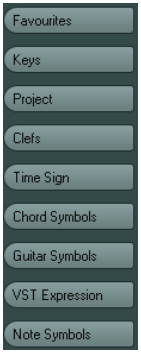
If you right-click on any closed tab in the Symbols Inspector and select "Setup…" from the context menu, a dialog appears. In this dialog you can configure where the separate tabs are placed in the Inspector and save/recall different configurations of the Inspector.



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" 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

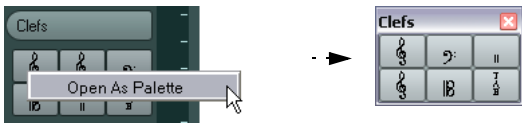
You can open any of the Symbols Inspector sections as separate symbol palettes.

Opening tabs as palettes

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:

- Favourites
- Keys
- Clefs
- Time Sign
- Chord Symbols
- Guitar Symbols
- VST Expression. This is described in the chapter “VST Expression” on page 62.
- Clef etc.
- Note Symbols
- Dynamics
- Line/Trill. Note that the arpeggios, hand indication and strum symbols are all “note-dependent”!
- Other
- Layout. All these symbols are drawn in their own “layer”.
- Project. These symbols are present in all layouts.
- Words. This is described in the section “The Words tab” on page 172.
- User Symbols. This is described in the section “User Symbols” on page 159.

When you place the mouse pointer on a symbol, a tooltip shows you information about the function. Further details about many of the symbols can be found in the section “Symbol details” on page 155.

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:

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.

⇨ 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 procedures 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 tab.

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), see "Dragging staves" on page 190 for info on how to separate the staves.
- If you find the score looks crammed after adding symbols, check out the section "Auto Layout" on page 192.

⚠ Symbols you add outside the margins are not printed!

About the Pencil tool

Unlike the other MIDI editors, the Score Editor toolbar does not contain a Pencil tool. Instead, the Pencil tool is "automatically" selected when you insert symbols. The following applies:

- Normally, the Pencil tool is automatically selected when you click on a symbol in the Inspector. However, if the "Double-click Symbol to get Pencil tool" option is activated in the Preferences dialog (Scores–Editing page), you need to double-click the symbol to get the Pencil tool.
- On the same page of the Preferences dialog, you can find an option called "Display Arrow tool after Inserting Symbol". When this is activated, the Object Selection ("Arrow") tool is automatically selected after you have inserted a symbol.

If you want to insert a lot of symbols with the Pencil tool, you may want to deactivate this option.

Adding note symbols

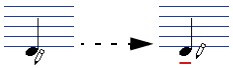
Adding a symbol to one note

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 Pencil tool" preference determines whether you need to double-click. In either case, the Pencil 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 Pencil tool

You might for example want to add a staccato symbol to all notes within a few measures. Proceed as follows:

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.

1. Make sure that the correct staff is active.

2. Click the symbol so that the Pencil tool is selected, as described above.

3. Hold down [Ctrl]/[Command] and click where you want to add the symbol.

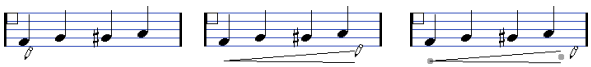
Adding other symbols

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. This is all described in detail in the section "Changing length, size, and shape" on page 153.



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.

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, described in their own chapter, "Working with text" on page 165.

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.

⇨ 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 (see "Graphic moving of notes" on page 135). The same is true if you adjust the width of the measure – the slur/tie is adjusted accordingly.

⇨ 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).

Drawing the slur/tie

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 Pencil 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

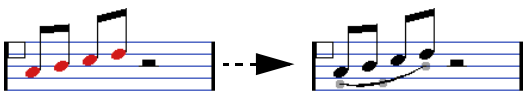
1. Select two notes.
2. Click the correct slur/tie symbol in the Inspector, so that the Pencil tool is selected.
3. Hold down [Ctrl]/[Command] and [Shift] and click on one of the two notes.

The slur/tie is added between the two selected notes.

Inserting a slur over a selection of notes

1. Select a span of notes.
2. Pull down the Scores menu and select “Insert Slur”.

A slur is created, starting at the first selected note and ending at the last.

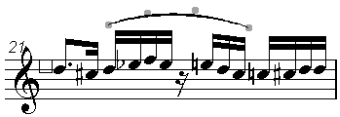


The Bezier slur

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 Pencil 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:

Option	Description
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, see “Hiding/showing objects” on page 185.

Creating trills

If you have recorded or entered a trill, Nuendo can help you display this properly:

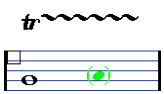
1. Select the notes that make up the trill.
2. Right-click on one of the notes and select “Build Trill…” from the context menu.
3. Select an option from the dialog that appears.

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.

Now the following happens:

- 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.



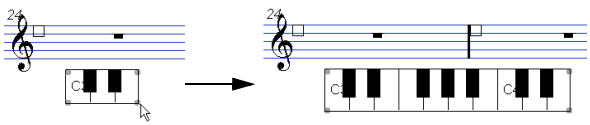
Inserting symbols across staves

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.

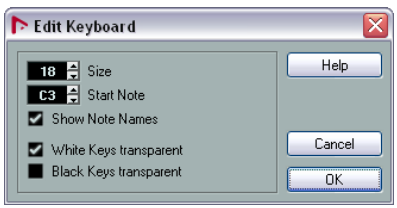
Adding a keyboard symbol

The Other tab contains a piano keyboard symbol, useful for example in educational scores. The symbol has the following properties:

- To insert the keyboard symbol, select it from the Inspector, click with the Pencil 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.



Option	Description
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.

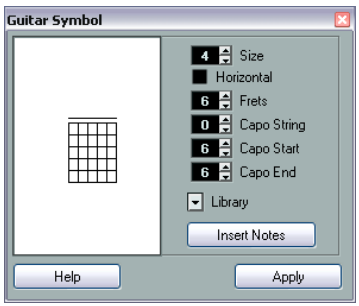
Guitar symbols are found on the “Guitar Symbols” tab and the Other tab in the Symbols Inspector.

- The Guitar Symbols tab contains all Guitar symbols of the current guitar library, see “Using the guitar library” on page 147. 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:

1. Open the Other tab.
2. Click on the guitar chord symbol, so that the Pencil 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.

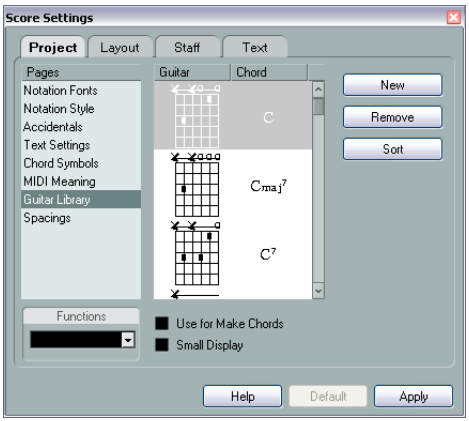
⇨ If you select "Make Chord Symbol" from the context menu, the corresponding chord symbol is displayed above the guitar symbol. This function is very useful when writing lead sheets, for example.

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

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.

⚠ 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 Chords	When this is activated, and you use the “Make Chord Symbol” function (see “Using Make Chord Symbols” on page 163), 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.

Inserting symbols from the library

Apart from the “Use for Make Chords” option above, there are two ways to insert symbols from the guitar library into the score:

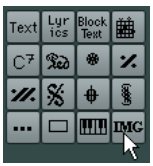
- Use the Functions pop-up menu on the Project–Guitar Library subpage in the Score Settings dialog, when creating or editing guitar symbols.
- Right-click on a guitar symbol in the score and select a chord symbol from the Presets submenu on the context menu.

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.

Proceed as follows:

1. In the Symbols Inspector, open the Other tab, the Layout tab, or the Project tab.
Image files can be inserted on all three layers, see “Background: The different layers” on page 140.



2. Click on the Image File button to select the Pencil 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.

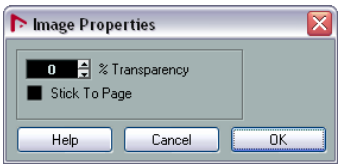
The lower section of the Import dialog contains the following settings:

- 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.

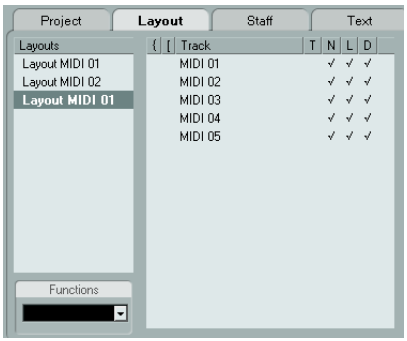
The image file is inserted. Its size depends on the printer resolution. However, you can scale the image by dragging its handles. To restore the printer resolution, right-click on the image to open the context menu and select “Snap to Printer Resolution”.

You can modify the settings you made on import by right-clicking on the image and selecting “Properties” on the context menu, to open the Image Properties dialog.



Using layout symbols

Symbols inserted from the Layout tab belong to the layout layer. When you are editing a layout containing several tracks, you can have inserted layout symbols automatically copied to any combination of tracks in the layout. You decide which staves should display layout symbols by ticking their “L” column in the Score Settings dialog, on the Layout page.



- Any editing you perform to layout symbols is automatically duplicated in the other tracks.
- The display of layout symbols for different tracks can be deactivated at any time.
- Layout symbols 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:

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 from the Layout tab 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.

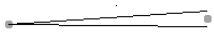
Using Project symbols

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.

⇨ 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. See “Scores and the Arranger mode” on page 205.

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

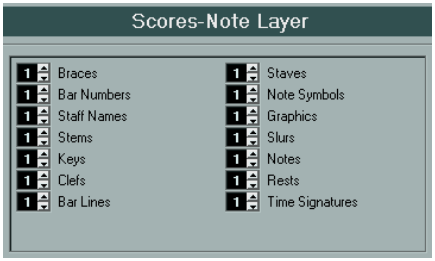
An exception to this are the slurs and ties which can be selected by clicking on the end points or by drawing a selection rectangle.

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

1. Open the Preferences dialog and select the Scores–Note Layer page.



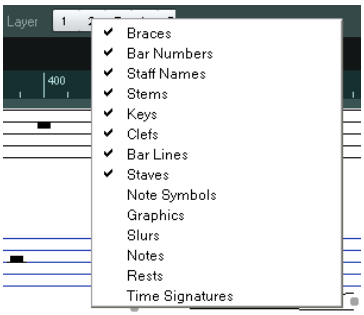
2. Assign each event type to a layer (1, 2, or 3).

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 – see "Moving by using the computer keyboard" on page 152).
- By using the bar handles (see "Moving and duplicating with the bar handles" on page 152).
- By using the Paste Note Attributes function (duplicating note symbols only – see "Copying settings between notes" on page 129).

Moving and duplicating by using the mouse

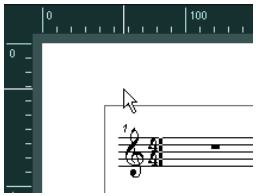
This is done much as with other objects in Nuendo. The following rules apply:

- 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 (see "Graphic moving of notes" on page 135) 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.

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 scroll bar at the far right.

- To display the ruler again, open the pop-up menu above the scroll bar at the far right and select one of the units (inches, centimeters, or points).

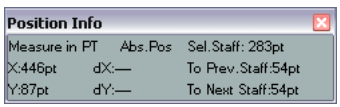
This setting also affects the units used in the Position Info window (see below).

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:

Option	Description
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”.

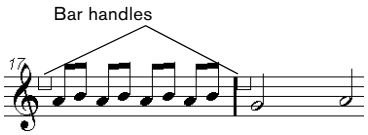
Selecting an object and using one of these commands is the same as dragging them with the Layout tool, but this method offers higher precision.

Moving and duplicating with the bar handles

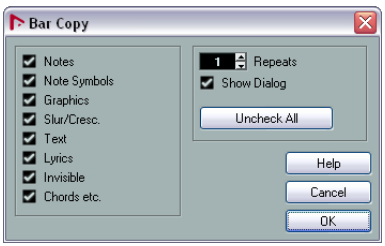
This function allows you to move or copy the contents of a whole bar to one or several other bars. You can select which elements in the bar will be included in the operation. Proceed as follows:

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.



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.

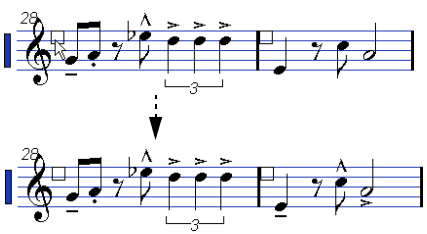
8. To copy the specified event types to another bar, hold down [Alt]/[Option], click on the bar handle of the first bar and drag it to the “target” bar.
To move the event types instead of copying them, drag the bar handle without holding down [Alt]/[Option].

- 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.

The following happens:

- 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 there already are symbols (or other objects) of the specified types in the “target” bars, these are removed.

- 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.

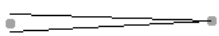
- To reset the vertical positions of note symbols and slurs in a score, right-click on the corresponding object and select “Default position” from the context menu.

Changing length, size, and shape

You can change the shape of any symbol that has a length. Proceed as follows:

Changing the length of a symbol

1. Select the symbol.
The handles appear.



Symbols with a length have two handles when selected.

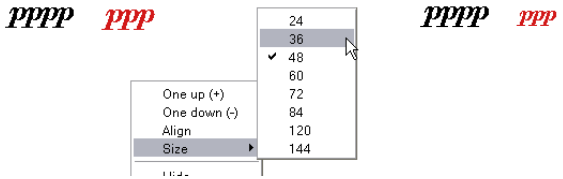
2. Drag one of the handles.
You may be restricted to vertically or horizontally only, depending on the type of symbol.

⚠ 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

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.



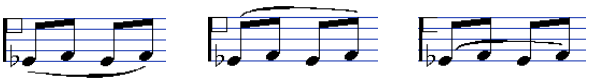
Altering the shape and direction of slurs and ties

⇨ This section describes how to alter the “regular” slur and tie symbols. How to add and edit Bezier slur symbols is described in the section “The Bezier slur” on page 145.

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.

⇨ To restore the default shape of a symbol, right-click on it and select “Default position” from the context menu, see “Moving note symbols” on page 153.

- 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.

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 in the Layout and Project tabs can be copied and pasted just as any other object in Nuendo. The following applies:

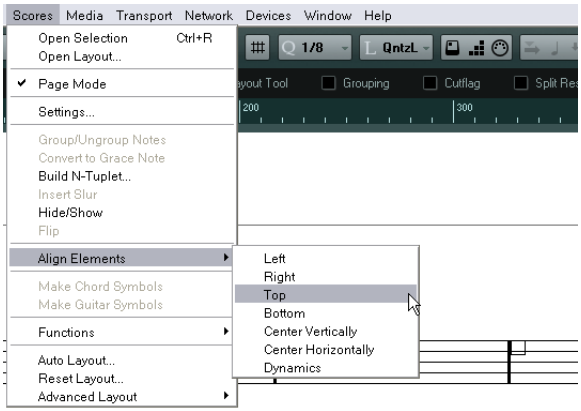
- Symbols that were tied to notes (e.g. accents) become “free-floating” objects when pasted.

That is, they are not tied to any note any more. If this is not what you want, consider copying with the bar handles, as described in the section “Moving and duplicating with the bar handles” on page 152.

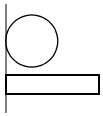
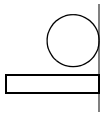
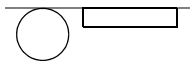
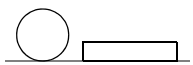
Alignment

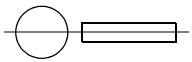
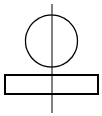
Symbols can be aligned as in drawing programs. Proceed as follows:

1. Select all objects that you want to align.
2. Open the Scores menu and select an option from the Align Elements submenu.



The following options are available:

Option	Result
Left	
Right	
Top	
Bottom	

Option	Result
Center Vertically	
Center Horizontally	

⚠ Note symbols like staccato and accents can only be aligned horizontally.

The “Dynamics” option is a special function for aligning dynamic symbols, as described in the section “Aligning dynamics” on page 156.

Symbol details

This section further describes some of the symbol tabs.

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. See “Inserting and editing clefs, keys, or time signatures” on page 106 and “Setting clef, key, and time signature” on page 81 for details.

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). For further information, see “Editing the key” on page 83.

⇨ 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, see “Inserting and editing clefs, keys, or time signatures” on page 106.

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. This dialog is described in detail in the section “Editing the time signature” on page 81. 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 “Text Settings” subpage of the Score Settings dialog (Project page).
The default font for this is the included “Steinberg Notation” font.

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.

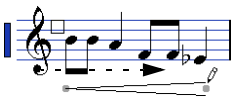
- To change the size of a dynamic symbol, right-click on it and in the context menu, select an option from the Size submenu.

- In the Line/Trill tab you can find a line symbol which allows you to create the following type of change in dynamics:

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.
  This is described in the section "Dynamic crescendo symbols" on page 206.
- 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.

Aligning dynamics

There is a special command for aligning dynamic symbols (including crescendos) horizontally. Unlike the regular align function (see "Alignment" on page 154), aligning dynamics takes the "baseline" of the dynamic letters into account, aligning them as text rather than as graphic symbols.

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 pulling down the Scores menu and selecting "Dynamics" from the Align Elements submenu.

The Line/Trill tab

Octave symbols

The octave symbols (8va and 15va) act as a "local display transpose" (see "Transposing instruments" on page 85) – 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.

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 Text 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. For more information see “Note layer symbols” on page 140 and the text about grace notes (which behave similarly) in the section “Grace notes” on page 136.

The Other tab

Lyrics and text symbols are described in the chapter “Working with text” on page 165. Chord symbols are described in the section “Inserting Chord symbols” on page 162.

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 (for more info on hiding symbols, see “Hiding/showing objects” on page 185).

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.

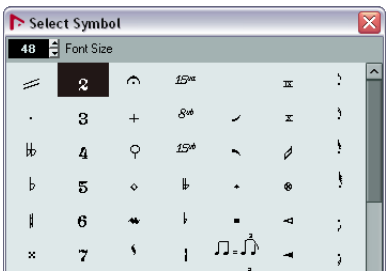
The box symbol is available in the “Other” and “Layout” tabs.

The keyboard symbol

This is described in the section “Adding a keyboard symbol” on page 146.

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 Layout tab

Rehearsal marks

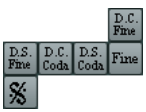
These come in two flavors: as numbers and as letters.

When you place the first of these in the score, it is labeled 1 or A (depending 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 so that they always make up a complete series of numbers/letters.

- You can select a font and size for rehearsal marks on the Project–Text Settings subpage of the Score Settings dialog.
This dialog also allows you 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.
This is done using 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 (Text Settings subpage) of the Score Settings dialog, see “Settings for other fixed text elements” on page 174.

- To have these symbols actually affect playback, insert them from the Project tab and use the Arranger mode.
See “Scores and the Arranger mode” on page 205.

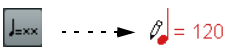
Endings

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 on the existing number and enter any text you like.

Endings are available on the Layout tab (for the layout layer), the Project tab (for the project layer), and the Line/Trill tab (for the note layer). 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 on an ending symbol and select the “Extend (+)” or “Reduce (-)” command to extend it 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 on it and select the desired note value from the context menu.

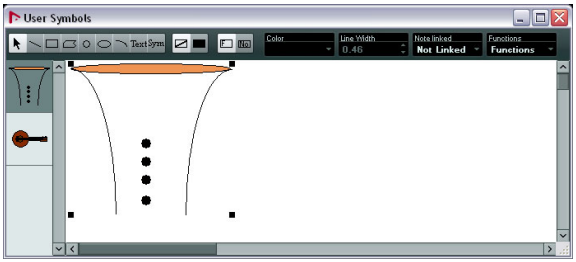
User Symbols

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:

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. Pull down 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:

Tool	Description
Arrow	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 pop-up menu	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:

Menu item	Description
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):

Menu item	Description
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.

14

Working with chords

About this chapter

In this chapter you 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

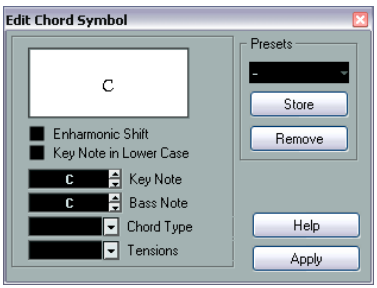
Manually

- On the Chord Symbols tab, you can find a set of predefined chord symbols, see "Using presets" on page 163. If the symbol that you want to add is among these, simply select it and click in the score to insert the chord symbol.

To specify and enter any other chord symbol, proceed as follows:

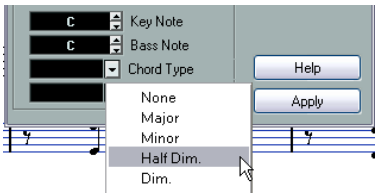
1. Open the Other tab and select the chord symbol button.

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 key (root) note in the Key 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.

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)

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 key note).
The program "remembers" the relation between key and bass note, so that if you change the key note, the bass note follows.

7. If you want the key note to be displayed in lower case, activate the "Key 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 on the symbol.
You can also right-click on the symbol and select "Properties" on the context menu to open the dialog.

Using presets

As with many other functions in Nuendo, you can create chord symbol presets for instant use. Each preset contains all settings in the dialog – i.e. the preset list is a "library" of chords. You can find the presets in the Chord Symbols tab in the Inspector and in the corresponding context menu. The preset handling is the usual:

- Click Store to store the current settings as a preset.
A dialog appears, allowing you to enter a name for the preset.
- To load a stored preset, select it from the Presets pop-up menu or select it from the Presets submenu of the context menu.
Note that this only loads the settings into the dialog – you need to click Apply to apply the settings to a selected chord symbol.
- To remove a preset, select it on the pop-up menu and click Remove.

Using Make Chord Symbols

If you already have recorded the chords for a project, Nuendo can analyze them and create chord symbols:

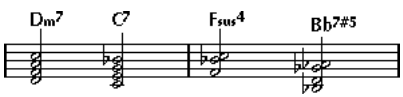
1. Open the recording in the Score Editor.
If you want the chords to be inserted on another track, you can create an empty part on that track and open it along with the recording.

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 and Notation Fonts subpages).
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 Chords" option is activated on the Project–Guitar Library subpage of the Score Settings dialog (see "Adding guitar chord symbols" on page 146), guitar chord symbols are added as well (if the guitar library contains any guitar symbols that match the chords).

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.

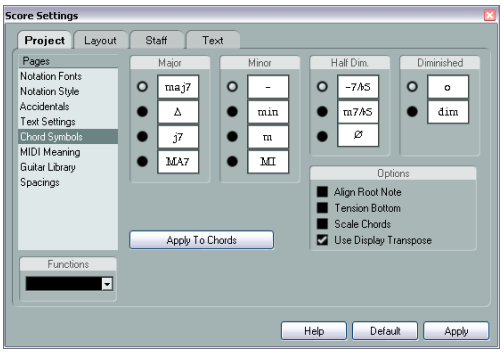
The Current Chord Display

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 and Notation Fonts subpages), there are several global settings that affect how chords are displayed. These settings affect all chords in the project.

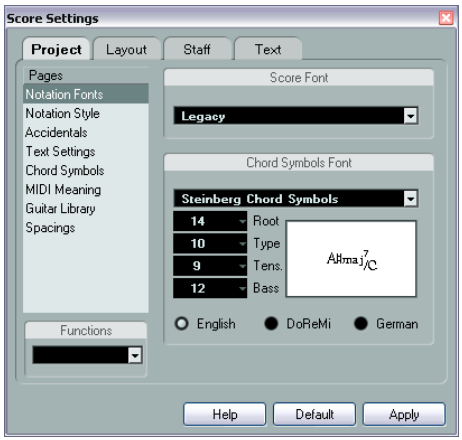
Chord Symbols



Use the four sections of radio buttons to specify how the four most common chord types are displayed:

- If you want the root (key) note to be aligned with the bass note, so that they are both displayed at the same vertical position, activate “Align Root 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”.
- Activate “Scale Chords” to scale a staff (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 “Use Display Transpose” if you want the chord symbols to be affected by the Display Transpose setting on the Staff page of the Score Settings dialog.
- To apply the settings to your score, click “Apply to Chords”.

Notation Fonts



- Use the Score Font pop-up menu to select a font for the display of note heads, clefs, etc.
  Available are Legacy, Classical, and Jazz.
- Use the Chord Symbols Font pop-up menu to select a font for the chords.
  Nuendo comes with its own font for this (Steinberg Chord Symbols), but you can also pick any other available font from the pop-up menu.
- Use the four size value fields to select sizes for the four different chord “elements”.
  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 the smallest.
- Use the radio buttons at the bottom to select a chord display mode.
  This affects how the key and bass notes are displayed:

Option	Description
English	Regular notation.
DoReMi	“Do-Re-Mi-…” are used instead of “C-D-E-…”
German	As English notation, but “B” is displayed as “H”, and “Bb” or “A#” are displayed as “B”.

15

Working with text

About this chapter

In this chapter you 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. As described in the section "Different types of text" on page 168, there are several different types of text symbols, but the basic procedures are the same (except for block text symbols, see "Block Text" on page 170, and page text symbols, see "Page text" on page 170).

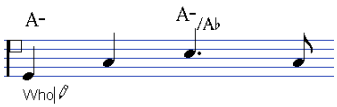
Inserting a text symbol

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), as described in the section "Selecting font, size, and style for the text" on page 167.
You can also change these settings after you inserted the text.

3. In the Symbols Inspector, open the desired symbol tab.
The different text symbols are found on the Other, Layout, and Project symbol tabs.

4. Click on the text symbol on the tab 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). See "Lyrics" on page 168 for details.



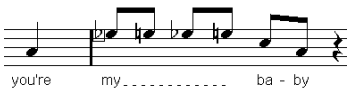
5. Enter the text in the text box that appears.
You can use [Backspace] to delete letters, and move the cursor with the arrow keys.

6. When you are done, press [Return].
The text appears. You can move, duplicate or delete it as with any symbol.

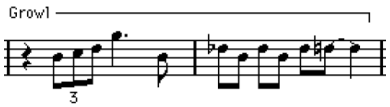
About the melisma lines

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:

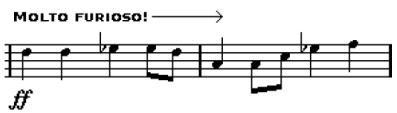
- If you are adding lyrics and want to indicate that a syllable should be sung over several notes:



- 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

- If you find that there is not enough space between staves, e.g. to add lyrics, please see "Dragging staves" on page 190 for info on how to separate the staves.
- If you find the score looks crammed after adding text, see "Auto Layout" on page 192.

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, see "Find and replace" on page 172.

Selecting font, size, and style for the text

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.

⚠ 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.
Most of the options are common text style variations such as bold, italic, underline, etc. But there are also a few special style options:

Option	Description
Frame	Allows you to put the text in a rectangular ("Box") or oval frame.
Melisma options	These determine the appearance of the "melisma line", see "About the melisma lines" on page 166.
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.

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.

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

1. Open the Score Settings dialog on the Project page and select the Text 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 text 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 store 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.

⇨ 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 text settings manually (on the Project–Text 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).

1. In the Score Settings dialog on the Project–Text 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

Regular text

This type of text is inserted by selecting Text in the Other or the Layout symbol tab.

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

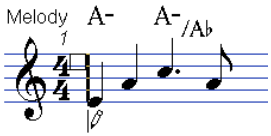
This type of text is inserted by selecting Lyrics on the Other symbol tab.

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.

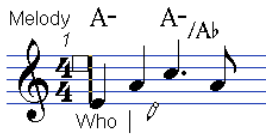
Inserting lyrics for a number of notes

1. With lyrics selected, click below or above the first note with the Pencil 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 (see "Auto Layout" on page 192).

Adding a second verse

To insert a second line of lyrics, proceed as follows:

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. Proceed as follows:

1. Make sure that the correct voice is selected (on the extended toolbar), see "Entering notes into voices" on page 119.
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).

Moving lyrics

If you want to move the lyrics up or down, for example to make room for a second verse, proceed as follows:

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:

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. Pull down the Scores menu and select "Lyrics from Clipboard" from the Functions submenu.
The lyrics are added, starting at the selected note.

Layout text

The text symbols in the Layout symbol tab are part of the layout layer, and can thus be hidden or shown for different tracks in the layout, by activating the "L" column 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 it is tied to the bar and staff position. If you move the bar or the entire staff, it moves with it.

Block Text

Block Text allows you to import text from a file on disk or from the clipboard. Proceed as follows:

1. Click on the Block Text symbol on the desired tab to bring up the Pencil tool.

You can choose between project layer block text (from the Project tab – useful for text that should appear on all pages, e.g. the score title), layout layer block text (from the Layout tab – if you want to print a title only for a particular track layout, e.g. for a particular instrument), or block text used for individual parts (from the Other tab – 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.

▪ Right-clicking on inserted Block Text brings up a pop-up menu with the following options:

Menu item	Description
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	Hides the inserted block text. To make the text visible again, activate the Hide checkbox in the filter bar, right-click on the text "Hidden" which is displayed for the hidden text and select "Show" on the context menu.

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:

Setting	Description
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.

Page text

The page text symbols are found on the Layout and Project tabs. They work the same way, but project page text is part of the project layout, and therefore 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).

To enter page text, proceed as follows:

1. Open the Layout or the Project tab of the Symbols Inspector.

2. Click on 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 that appears.

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:

Option	Description
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.

Option	Description
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).

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.

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:

Text to enter	Text that is displayed
%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, Layout, and Project tabs of the Symbols Inspector, see “Symbol details” on page 155.

- On the Layer pop-up menu, select the layer that you want to use.

The text symbols available for this layer is 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.

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

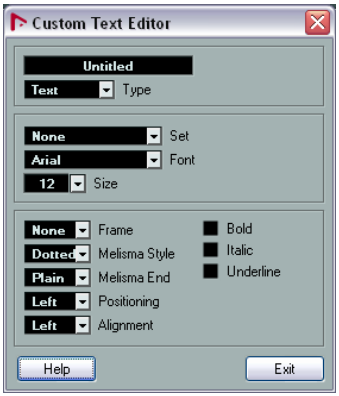
The Words tab

If you have certain words that you use a lot, you can “store” 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

1. Open the Words symbol tab.
This tab is hidden by default. See “Showing/Hiding Symbols Inspector tabs” on page 141 for information on how to display hidden Inspector tabs.

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.

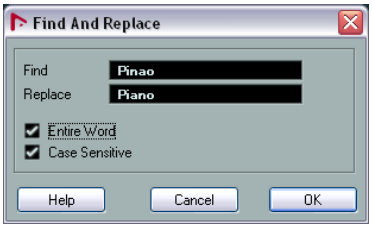
Inserting a word

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. Proceed as follows:

1. Pull down 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.

⚠ 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.

To select a font for staff names, proceed as follows:

1. Open the Score Settings dialog on the Project page and select the Text 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 Track 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, see “Staff names” on page 110.

- You can fine-tune the vertical and horizontal position of staff names with some of the options on the Project–Spacing subpage of the Score Settings dialog.

Bar Numbers

Bar Number settings can be made in several places as well.

General settings

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 Status 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.

Text 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–Text Settings subpage.

Spacing

On the Project–Spacings subpage of the Score Settings dialog, you can find four settings that relate to bar numbers:

Option	Description
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.

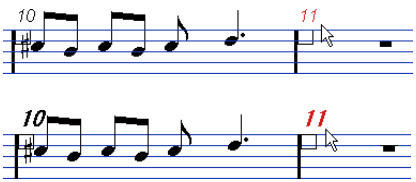
- Bar number offsets belong to the Project layer and are shown for all tracks and layouts.

Settings for other fixed text elements

You can make text settings for virtually all text and numbers that appear in the score. Proceed as follows:

1. Open the Score Settings dialog on the Project page and select the Text 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 text settings.

- You can also define text attribute sets on the Text 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 (see “Text attribute sets” on page 167).

16

Working with layouts

About this chapter

In this chapter you 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 (see “The available symbols” on page 142).
- All settings on the Layout page of the Score Settings dialog.
- The vertical spacing of the staves.
- Bar line spacing.
- Broken bar lines.

⇨ Note that Project symbols (see “The available symbols” on page 142), bar line types and bar number offsets are part of the Project layer, and appear in all layouts.

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 store 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].

⚠ 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.

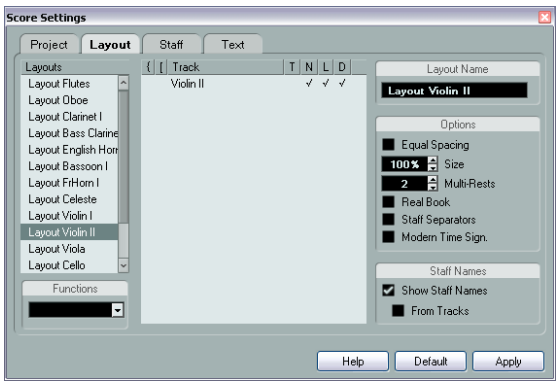
Opening a layout

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

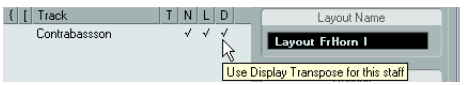
- To rename a layout, select it in the list and enter the desired name in the Name field to the right in the dialog.
  Initially, a layout gets the name of one of the edited tracks – it may be a good idea to give each layout a more informative name.
- To remove a layout you no longer need, select it 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.

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 (see “Importing layout symbols” on page 177).

⚠ 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”.

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:

1. Pull down 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”.

⇨ Only the markers of the active marker track are displayed.

17

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.

⇨ 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?

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 store 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:

Notes	Export	Import
Pitch	Yes	Yes
Length	Yes	Yes
Staves	Yes	Up to two per part
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
Layout		
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
Symbols		
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.
Global 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
Formatting		
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

1. Pull down 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

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”).

18

Designing your score: additional techniques

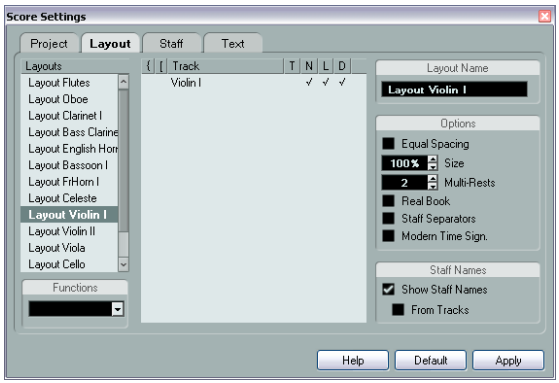
About this chapter

In this chapter you 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.

⚠ 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:

Option	Description
Brackets	These two columns allow you to add braces or brackets, encompassing any number of staves in the layout, see “Adding brackets and braces” on page 192.
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.

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, see “Staff size” on page 185.

Multi-Rests

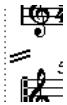
Whenever more than one-bar rests occur, the program can replace these with a multi-rest symbol. This parameter allows you to set how many empty bars are “allowed” before Nuendo collects them into a multi-rest. “Off” means “never”. See “Multiple rests” on page 187 for more information on multi-rests.

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

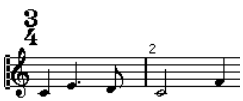
When this option is activated, separator symbols are inserted at the beginning of each grand staff.



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

For one staff

You can set the staff size as a percentage value of the normal size.

1. Make sure that the staff you want to edit is active.

1. Open the Score Settings dialog on the Staff page and select the Options tab.

2. Adjust the Size parameter in the System Sizes section.
The values range from 25% up to 250% of the normal size.

3. Click Apply.

For all tracks in a layout

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.

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.

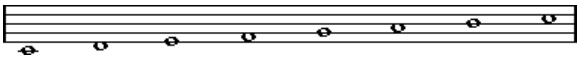
Hiding/showing objects

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

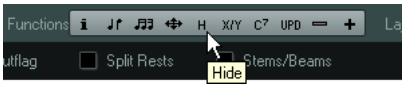
If you have recorded your music, you may have added glissandos, falls, etc. that sound fine but result in a lot of unnecessary notes. You probably want to hide those notes and insert the suitable symbols instead.

Hiding

To hide items, proceed as follows:

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 (see “Other note details” on page 128).

⚠ 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.

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.

⚠ This is not possible when hiding notes, only other symbols.

⇨ 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

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, as described in the section “Reset Layout” on page 194.

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:

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–Use 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.

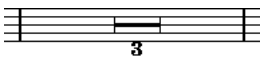
Coloring notes

You can use the color pop-up menu on the toolbar to colorize selected notes, e.g. for educational purposes. This is described in detail in the section “Coloring notes” on page 129.

Multiple rests

Multiple consecutive rests can be automatically displayed as multi-rests. Proceed as follows:

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.
The multi-rests now appear in the score.

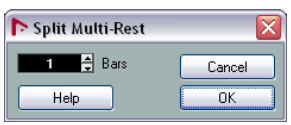


A multi-rest over three bars

Splitting multi-rests

To divide one long multiple rest into several shorter ones, proceed as follows:

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.

⚠ 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:

Option	Description
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.

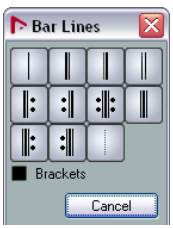
- On the Spacings subpage of the dialog, you can adjust the height and width of multi-rest symbols.
- On the Text Settings subpage, you can select a font for the multi-rest numbers (select “Multi-Rests” in the “Font For” pop-up menu and make the desired settings).

Editing bar lines

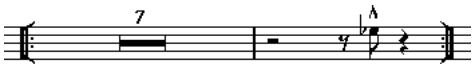
Editing existing bar lines

For each bar line, you can choose whether you want a regular, single bar line, a double bar line, a repeat sign, etc.:

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.

⇨ The bar line types are part of the Project layer – any changes you make are reflected in all layouts.

Creating upbeats

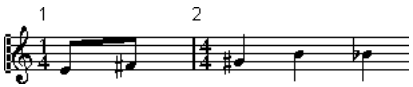
By using the Pickup Bar feature

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.

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 Sign” section in the Symbols Inspector and click in the Score with the Pencil tool.

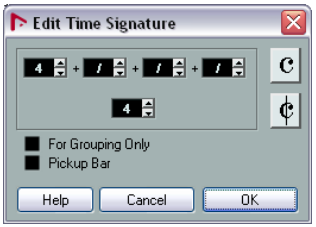
3. Enter the notes in the upbeat into the first bar.



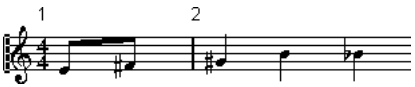
The first bar before making any adjustments

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

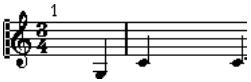
With this method, the first bar actually gets the same time signature as the following bars – it only looks like an upbeat bar:

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.

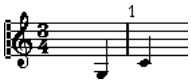
3. Drag the bar line between measure one and two to adjust the width of the bar.



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

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 (see "Auto Layout" on page 192), you can set the maximum number of bars across the staff.

Manually

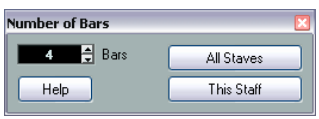
In Page Mode, you have full control over the number of bars appearing across the page, by using the Number of Bars dialog or the tools.

⇨ If you want to use the "Max. number of Bars" option in the Auto Layout dialog (see "Auto Layout" on page 192), you should do this before you adjust the number of bars manually.

Using the Number of Bars dialog

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. Pull down the Scores menu and select "Number Of Bars" from the Advanced Layout submenu.
The Number of Bars dialog opens.

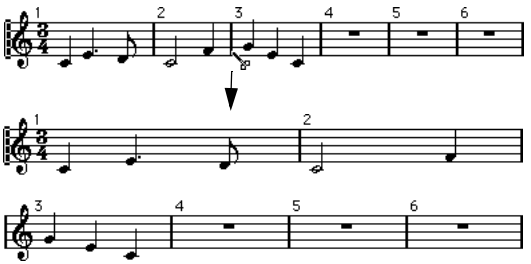


3. Set the desired number of bars across the page.

- 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.

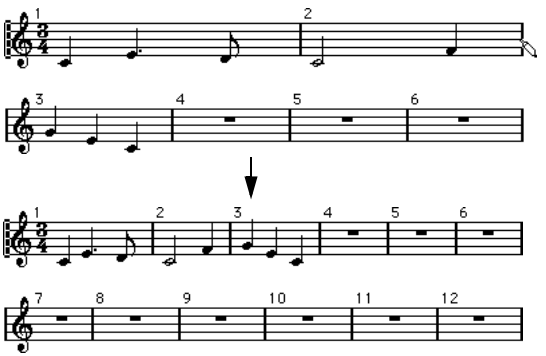
Using the tools

- 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

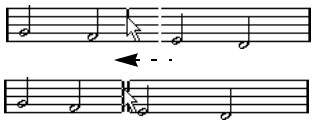
If you drag a bar line to the left or right, the surrounding bars are adjusted proportionally.

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

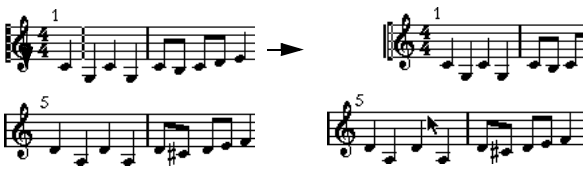
If you hold down [Ctrl]/[Command] while dragging a bar line, the widths of the surrounding bars are not affected.



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:

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, see “Using the Number of Bars dialog” on page 189.

5. Close the dialog.

The bar spacing is reset for the currently selected staff and all following staves.

Dragging staves

For the following operations, you can use the Object Selection tool or the Layout tool.

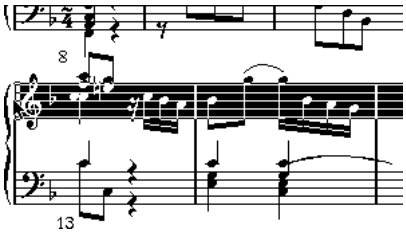
⇨ Dragging staves can only be done in Page Mode.

Adding space between two grand staves

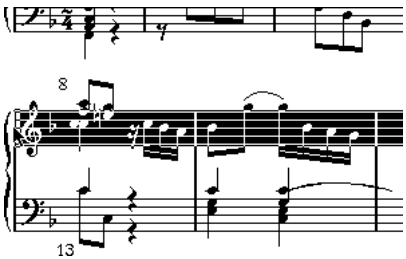
1. Locate the first staff in the lower of the two systems that you want to spread apart.
2. Click just to the left of the first bar line and keep the mouse button pressed.

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

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.

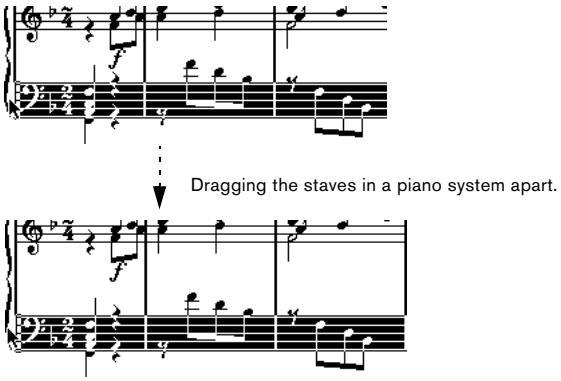
⚠ This operation affects the system you drag and all following systems.

Setting the distance between staves within a grand staff

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.
The new distance is set for the two staves.



Dragging the staves in a piano system apart.

Setting the same distance between staves in several systems

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:

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

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

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.

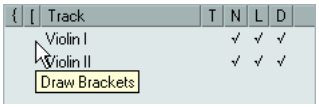
2. Right-click on the blue rectangle to the left of the staff, and select “Move to Previous Page” from the context menu.
The active staff, and as many of the following staves as there are room for, are moved to the previous page. If the previous page is already “full”, nothing happens.

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.

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.

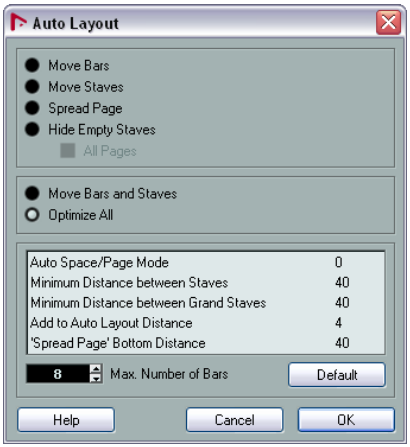
- You can edit brackets and braces in the dialog by dragging the ends of the indicator in the list.
- To remove a bracket or brace, click on its indicator in the list.

⇨ You can automatically get broken bar lines based on the brackets you have added – see “Breaking bar lines” on page 194.

⇨ 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.

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.



⚠ 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.

⇨ 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:

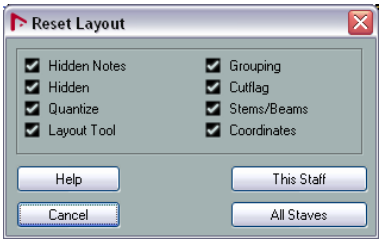
Setting	Description
Auto Space/ Page Mode	The higher the value, the more space is allowed for each element in the score (and thus, the fewer the bars across the page).
Minimum Distance between Staves	When you use an Auto Layout function that moves staves (changes the vertical staff distance), this setting 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.

⇨ 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.

1. Select “Reset Layout…” from the Scores menu.
The Reset Layout dialog appears.



The following options are available:

Option	Description
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.

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.

Breaking bar lines

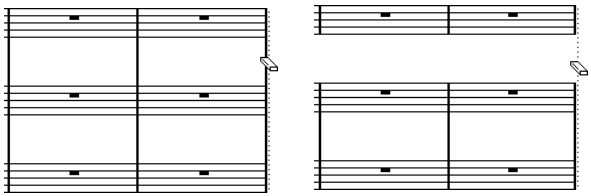
Sometimes you may not want a bar line to stretch all the way across a grand staff. If this is the case, you have the possibility to “break it”.

Manually

Breaking bar lines in one grand staff

1. Select the Erase tool.

2. Click on a bar line connecting the 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.



Before and after splitting the bar lines between two staves.

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.

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 (see “Adding brackets and braces” on page 192), you can have bar lines broken between each bracketed “section”, giving a clearer indication of which staves belong together:

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.

19

Scoring for drums

About this chapter

In this chapter you 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

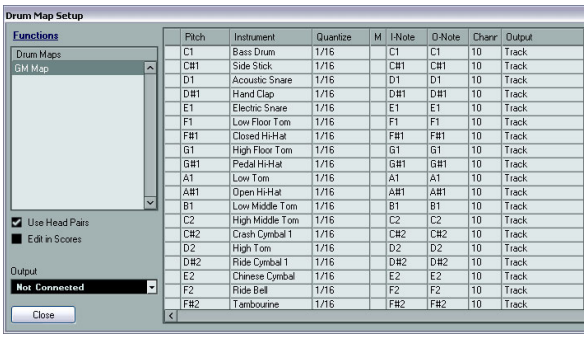
When scoring for drums, you can assign a unique note head to each pitch. There is even the possibility to set up different note heads for different note values!

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

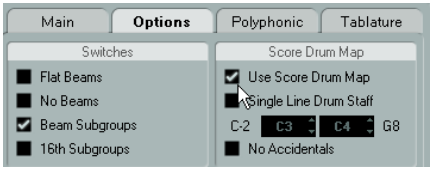
Nuendo handles drum editing by means of drum maps (see the chapter "Editing drums" on page 54). In the Score Editor, the drum map displays different note heads for different pitches.

You access the drum map by selecting "Drum Map Setup" from the MIDI menu.



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

Basic settings

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.

The dialog contains the following score-related options:

Option	Description
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 are 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.

⚠ 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.

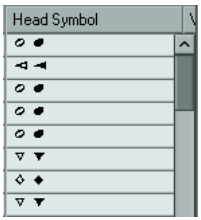
Initializing the display pitches

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:

1. Activate the “Use Head Pairs” checkbox.
The “Head Symbol” column now shows two head symbols for each drum sound.



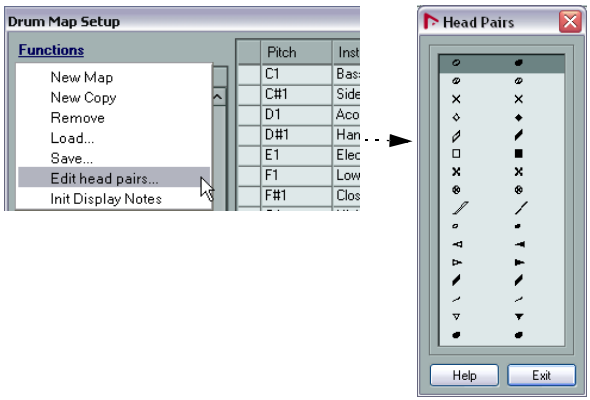
All head symbols are arranged in pairs – by default an “empty” head and a “filled” head. Just as with regular notes, the “empty” note heads are used with half notes and larger note values, and the “filled” heads are used with quarter notes and smaller note values.

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:

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.

⇨ 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

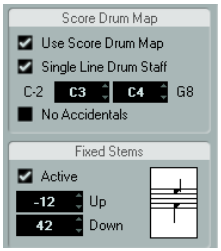
1. Open the Score Settings dialog on the Staff page and select the Options tab.

2. Make sure that “Use Score Drum Map” is activated.

3. If you want a single line drum staff, activate the corresponding option (see “Using “Single Line Drum Staff”” on page 199).

4. If you want flat beams, activate the corresponding option (see “Handling beaming” on page 129).

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. See the chapter “Polyphonic voicing” on page 115 for more information about polyphonic voices.

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”.

⇨ If the drum map contains two notes with the same pitch (for example Open and Closed HiHat), 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:

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.

⚠ 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.

20

Creating tablature

About this chapter

In this chapter you 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”.

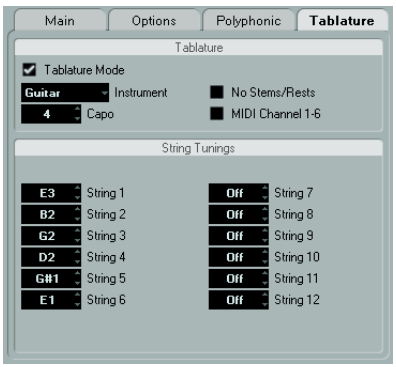
⚠ Even though we use the term “converting” in this chapter, please note that tablature is a mode. You can switch between regular notation and tablature at any time.

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.

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”.

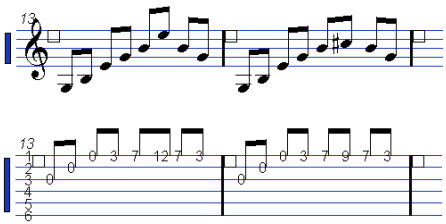
4. Select one of the predefined instruments from the pop-up menu.

- 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.

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.

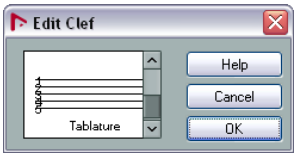
For example if you played a "B" on the low E-string, it appears as a "7" on that string, not as a "2" on the A-string.

Creating tablature manually

To set up an empty system for inputting tablature, proceed as follows:

1. Double-click on the clef symbol in the score to open the Edit Clef dialog.

2. Change the clef to the tablature symbol.

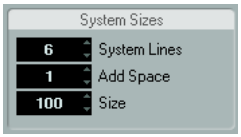


3. Open the Score Settings dialog on the Staff page and select the Options tab.

4. Set the "System Lines" to as many strings as the instrument you are scoring for has.

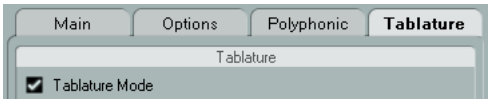
5. Raise the Add Space value to 1 or 2.

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–Text Settings subpage, you can find text settings for the tablature numbers. In the "Font For" pop-up menu, select "Tablature" 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 a “8” on the low E-string rather than a “3” on the A-string on a guitar, proceed as follows:

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.

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.

21

The score and MIDI playback

About this chapter

In this chapter you learn:

- How to use the Arranger mode to have the playback follow the structure of the score.
- How to use the MIDI Meaning function.
- How to use crescendo/diminuendo symbols with integrated dynamics.

⇨ You can also play back articulations in the Score using the VST Expression functionality. This is described in detail in the chapter "VST Expression" on page 62.

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:

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.

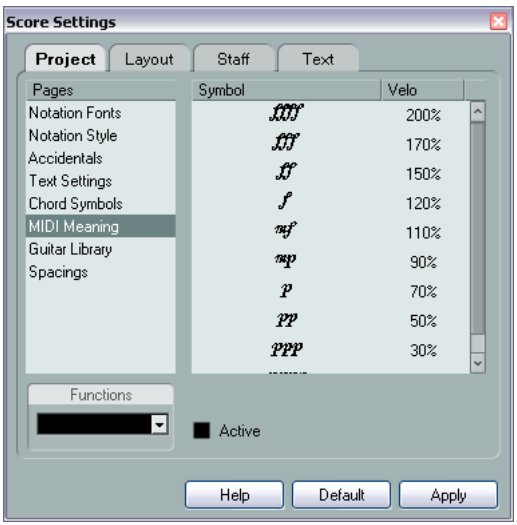
The MIDI Meaning function

The MIDI Meaning function interprets some dynamic symbols, affecting the velocity of notes during playback.

⇨ This is done in realtime during playback – the actual notes are not affected!

Proceed as follows:

1. In the Score Settings dialog, open the Project page and select the MIDI Meaning subpage.



As you can see, the dialog lists the dynamic symbols to the left. To the right is a column, allowing you to specify in which way each symbol should affect the velocity of the notes as they are played back.

2. Set up the dynamic symbols.
If you set the fortissimo symbol (ff) to mean Velocity=150% and insert a fortissimo symbol in the score, all notes are played back with 1.5 times their actual velocity, from that point in the score until the next dynamic symbol.

3. To activate MIDI Meaning, click the Active checkbox.

4. Click Apply and close the dialog.
Now, note symbols and dynamics affect the notes on playback.

⇨ For dynamic changes to take effect, the MIDI sound source must respond to velocity. Also note that the maximum note velocity is always 127. If all notes were recorded or entered with maximum velocity, Velocity settings over 100% do not have any effect.

Dynamic crescendo symbols

On the Dynamics tab of the Symbols Inspector, you can find a special crescendo symbol:

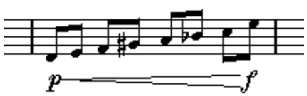
This allows you to enter a crescendo or diminuendo in the score and have the note velocity adjusted accordingly during playback. The same rules apply as for MIDI Meaning:

- The actual notes are not affected – the settings affect playback only.
- For the crescendo/diminuendo to be heard, the MIDI sound source must respond to velocity.
- The maximum note velocity is always 127. If the notes are recorded or entered with high velocity values, you may not hear any difference between forte and fortissimo, for example.

Proceed as follows:

1. Select the dynamic crescendo symbol and make sure that the Pencil tool is selected (see "Adding symbols to the score" on page 143).

2. Click where you want the crescendo or diminuendo to start, drag to its end position and release the mouse button.
By default this inserts a crescendo from piano (p) to forte (f).



3. To adjust the dynamics at either end of the crescendo, right-click to bring up a palette from which to select the desired dynamic symbol.
If you select a dynamic symbol at the start that is "louder" than the one at the end, the crescendo symbol is automatically changed to a diminuendo symbol.

- In the palette for the start symbol you can find three additional options: "cresc", "dim", and "None" (no symbol is shown).
If any of these is selected, the crescendo or diminuendo start from the "current dynamic", i.e. with the level according to the previous dynamics symbol in the staff.

4. In the Score Settings dialog on the Project page, select the MIDI Meaning subpage and make sure that the Active checkbox is activated.
The dynamic crescendo/diminuendo makes use of the MIDI Meaning function and uses the velocity scaling you have set up for the dynamics symbols in this dialog.

5. Start playback.
You should now hear the crescendo or diminuendo affect the note velocities.

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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:

1. Open the Preferences (Scores–Editing page) and deactivate the “Global staff Spacing with [Alt Gr]/[Option]-[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 Gr]/[Option]-[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. For more information, see “Moving and duplicating with the bar handles” on page 152.

- 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.

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.
For more information, see “Moving and duplicating with the bar handles” on page 152.

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.

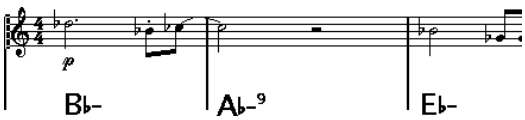
In this case, try using the “Scores Notes To MIDI” function. Note that you should work on a copy of the track! For more information, see “Using “Scores Notes To MIDI”” on page 92.

Optimizing rests

If you have a number of consecutive empty bars, you can replace them with one multiple rest, see “Multiple rests” on page 187.

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, see “Using Make Chord Symbols” on page 163.

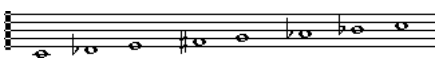


A lead sheet created by specifying “0” system lines

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.

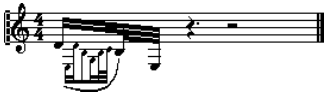


An example scale without bar lines

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, see “Adding a symbol to several notes using the Pencil tool” on page 143.

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. See the chapter “Working with layouts” on page 175 for details.

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, see "Important! – Symbols, staves, and voices" on page 142.

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. Please observe the warning in the section "Important! – Symbols, staves, and voices" on page 142.

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 (please refer to the chapter "How the Score Editor works" on page 70). If No Overlap is activated, you might want to turn it off.

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 – see "Changing the length of notes" on page 103) or delete the one you have (see "Deleting notes" on page 107) 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 (see "Using Rests as Display Quantize setting" on page 73).

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 (if this is not shown, see "The info line" on page 79). Move it to the correct pitch (see "Editing pitches of individual notes" on page 102). If this is not the reason, maybe you have the wrong key set? And finally, you can also use enharmonic shifting (see "Accidentals and enharmonic shift" on page 126).

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. This is described in the section "Handling beaming" on page 129.

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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