

# Operation Manual



# HALION7

Sample and Synthesis Platform





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# Table of Contents

<b>5</b>	<b>New Features</b>	<b>102</b>	Importing Multiple Samples Using Drag And Drop
<b>10</b>	<b>Introduction</b>	<b>103</b>	<b>Editing Programs and Layers</b>
10	Typographical Conventions	103	Managing Sections
11	How To Contact Us	104	Main Section
11	About the Documentation	105	Trigger Section
11	Setting Up	107	Voice Management Section
<b>14</b>	<b>HALion Control Panel</b>	111	Variation Groups Section
14	Setup Options	112	Note Expression Section
15	View and Tab Operations	113	Macro Page Editor
16	Available Editors	<b>115</b>	<b>Editing Zones</b>
18	Screen Sets	115	Adding Zones
18	Opening Additional Windows	115	Zone Types
19	Locking Windows	117	Adding Samples to Empty Zones
19	Setting the Focus	117	Absolute and Relative Editing
19	Home Screen	117	Zone Editor Toolbar
<b>22</b>	<b>Common Editing Methods</b>	118	Zone Info Bar
22	Knobs and Sliders	119	Managing Sections
22	Multi Selection and Parameter Controls	119	Voice Control Section
23	Buttons	123	Voice Control Section for Organ Zones
23	Value Fields	124	Pitch Section
24	Key Commands Dialog	125	Oscillator Section
24	Presets	128	Sample Oscillator Section
<b>27</b>	<b>Global Functions and Settings</b>	136	Grain Oscillator Section
27	Plug-in Functions Section	145	Organ Oscillator Section
29	Plug-in Name and Steinberg Logo	146	Wavetable Section
29	Toolbar	154	FM Oscillator Section
32	Keyboard Editor	167	Spectral Oscillator Section
33	Quick Controls	180	Filter Section
41	Options Editor	183	Amplifier Section
49	AI Knob Support	185	Envelope Section
<b>51</b>	<b>Automation</b>	196	LFO Section
51	Automation Parameters	201	Step Modulator
51	Automation Editor	203	Modulation
52	Setting Up Automation	<b>221</b>	<b>Editing Samples in the Sample Editor</b>
<b>54</b>	<b>Managing Your Sounds</b>	221	Loading and Previewing Samples
54	Programs, Layers, and Multi-Programs	221	Zone Info Bar
55	Registering VST Sounds	222	Toolbar
55	Loading Programs and Layers	226	Info Line
57	<b>Load</b> Dialog	227	Overview Line
62	Slot Rack	228	Waveform Display
68	Managing and Loading Files	230	Parameter Section
92	Working with General MIDI Files	239	Sample Editor Context Menu
<b>93</b>	<b>Mapping Zones</b>	242	Markers
93	Mapping Editor	243	Setting up the Sample Range
96	Mapping Editor Context Menu	243	Zooming
100	Sample Zones and their Root Keys	244	Editing Samples in an External Editor
100	Moving Zones	244	Creating Loops
100	Creating Fades and Crossfades	246	Creating Slices Automatically
100	Setting Key Range and Velocity Range	247	Sample Replacement
101	Zooming	<b>248</b>	<b>Wavetable Synthesis</b>
101	Selecting Zones	249	Wavetable Editor
102	Importing Single Samples Using Drag And Drop	269	Creating a Wavetable
		269	Pitch Detection
		270	Markers

271	Replacing Samples	497	<b>Macro Pages</b>
271	Importing Wavetables	497	Macro Pages, Templates, Controls, Resources, and Libraries
272	Managing Wavetables	498	Getting Started
<b>273</b>	<b>MIDI Editing and Controllers</b>	502	Macro Page Designer
273	MIDI Editor	521	Editing and Assembling Elements
275	MIDI Controllers	537	Libraries
<b>279</b>	<b>Mixing, Routing, and Effect Handling</b>	537	Connecting Macro Page Controls to HALion Parameters
279	Mixer Window	539	Collaboration on Macro Pages
281	Audio Bus Architecture	540	Cleaning Up and Consolidating Your Macro Pages
286	Insert Effects	541	Saving Macro Pages
<b>288</b>	<b>Loading and Managing Programs via the Program Table</b>	<b>542</b>	<b>Library Creator</b>
288	Program Table	542	Libraries
289	Loading Programs in the Program Table	547	Library Creator Editor
289	Configuring the Program Table	557	Unassigned VST Sound Containers
290	Program Table Context Menu	558	Consistency Check
<b>292</b>	<b>Program Tree</b>	<b>560</b>	<b>Effects Reference</b>
292	Program Tree Elements	560	Reverb Effects
295	Program Tree Toolbar	564	Delay Effects
297	Program Tree Columns	566	EQ Effects
300	Program Tree Context Menu	570	Filter Effects
305	Color Scheme	577	Distortion Effects
305	Importing Samples	585	Pitch Shift Effects
310	Replacing Samples	586	Modulation Effects
311	Exporting Samples	597	Dynamics Effects
316	Exporting Programs and Layers with Samples	606	Spatial and Panner Effects
320	Exporting Programs and Layers as HALion Sonic Layer Presets	607	Surround Effects
322	Exporting Programs and Layers as VST 3 Presets with Files	609	Tools Effects
322	Sliced Loop Import	610	Legacy Effects
326	Selections in the Program Tree	<b>621</b>	<b>MIDI Modules Reference</b>
327	Navigating in the Program Tree	621	Common Functions
327	Setting Up the Program in the Program Tree	624	FlexPhraser
327	Renaming Elements	634	Trigger Pads
<b>331</b>	<b>Parameter List</b>	637	MIDI Player
331	Toolbar	642	Drum Player
332	Columns	647	Mono Envelope
<b>334</b>	<b>Sample Recorder</b>	649	Mono LFO
335	Main Tab	651	Mono Step Modulator
338	Options Tab	653	True Pedaling
339	Auto Trim	654	MegaTrig
340	Recording From an Audio Track That Contains Multiple Drum Sounds	662	Layer Alternate
341	Recording the Output of Another Plug-in	664	Key Switch Alternate
342	Monitoring the Input Signal	666	Key Switch Remote
<b>343</b>	<b>Included Instruments</b>	667	MIDI Randomizer
343	Auron	668	CC Mapper
358	Trium	669	Velocity Curve
372	Voltage	670	Tuning Scale
385	Model C	671	Lua Script
391	HALiotron	<b>675</b>	<b>Key Commands Reference</b>
393	B-Box	<b>678</b>	<b>Using the Standalone Version of the Plug-in</b>
401	World Instruments	678	Preferences Settings
412	World Percussion	678	Preferences Dialog
416	Anima	680	Selecting the MIDI Input and the Audio Output
441	Skylab	681	Scratch Pad
460	Raven	682	Loading a MIDI File
462	Eagle	683	Saving a MIDI File
463	Hot Brass	683	Master Volume
481	Studio Strings	<b>684</b>	<b>Index</b>



# New Features

The following list informs you about the most important improvements in HALion and provides links to the corresponding descriptions.

## New Features in Version 7.0.0

### Highlights

#### MediaBay

- The **MediaBay** has been redesigned to allow for an easier and quicker search. You can choose from filter tags that are proposed by the **MediaBay** based on your search settings, you can configure attribute menus to narrow down the search results, and you can save your search settings as presets to use them when looking for similar content. Furthermore, with the **Synchronize Filter Settings with Selected Slot** button, you can instruct the **MediaBay** to use the search settings last used for the selected slot, which makes it easier to exchange a program with a similar program, for example. See [MediaBay](#).

#### Spectral Synthesis

- With the new spectral zones, you can use spectral re-synthesis as a sound source. See [Zone Types](#).
- You can now re-synthesize your samples by means of spectral zones and the spectral oscillator. This allows for a wide range of creative sound editing. See [Spectral Oscillator Section](#).

#### FM Synthesis

- With the new FM zones, you can use frequency modulation as a sound source. See [Zone Types](#).
- In the **FM Oscillator** section of the **Zone Editor**, you can set up the new FM zones. See [FM Oscillator Section](#).

#### Envelope Editing

- The **Envelope** section has been redesigned, and several new editing functions are available. The new **Shaper** envelope mode has been added. Furthermore, the **Pitch** and **User** envelopes now have a **Bipolar** button, allowing you to switch the envelopes from unipolar to bipolar, and vice versa. See [Envelope Section](#).
- With the **Edit** tool, you can now edit multiple selected envelope nodes much more conveniently than in previous versions. See [Node Editing](#).

#### Modulation

- The entire modulation concept has been improved. For example, parameters that can be modulated are now indicated by small triangles in the **Zone Editor**, making it easier to locate them. See [Modulation](#).
- You can now assign and edit modulation sources and destinations not only in the modulation matrix, but in dedicated modulation rows in the **Zone Editor**. See [Modulation Rows in the Zone Editor](#).
- In the **Zone Editor**, you can create modulations using drag and drop. See [Creating Modulations Using Drag and Drop](#).
- You can now directly jump to the edit section for a modulation source or destination from within the modulation row. See [Modulation Parameters](#).

### Wavetable Synthesis

- You can now use multi-channel wavetables. See [Wavetable Synthesis](#).

### Macro Page Designer

- In the **Templates Tree**, templates with attached scripts are shown in a different color. Furthermore, you can edit the script parameters in the **Properties** section, open a connected script for editing, or create a new script for a template. See [Templates Tree](#).
- You can now use SVG graphics in your macro pages, allowing for smoother scaling of elements. See [Resources Tree Elements](#).
- You can use decors in the **Macro Page Designer**, that is, definable rectangles of a fixed or scalable size that allow you to create simple graphical switch states without the need for a bitmap resource, for example. See [Resources Tree Elements](#).
- You can create color resources in the **Macro Page Designer** and use them in **Font** and **Decor** resources. See [Resources Tree Elements](#).
- Via the **Resources Tree**, you can now export SVG graphics to a folder in your system, to use them on other macro pages. See [Resources Tree Context Menu](#).

## More New Features

### Load Dialog

- When loading programs, layers, and multi-programs, you can now switch between the **MediaBay** and the **File System** pages. See [Load Dialog](#).

### Wavetable Oscillator

- The following new functions have been added to the wavetable oscillator: **Acceleration** and **Target Speed** allow you to further modify the **Speed** parameter. **Hold** allows you to hold the last spectrum. The display now offers a channel selector. Furthermore, a **Filter** section was added. See [Oscillator Tabs](#).

### X-LFO

- In addition to the two polyphonic LFOs, HALion 7 offers an X-LFO for synth, sample, grain, FM, spectral, and wavetable zones. This can be used to modulate two-dimensional XY parameters. See [X-LFO](#).

### Decompose

- The **Decompose** function allows you to split your samples into their noise and tonal components and to edit those components separately. See [Decompose Page](#).

### Wavetable Editor

- The **Sample** tab in the **Wavetable Editor** has been redesigned, and several new functions have been added: You can now show a spectrometer in the waveform display, the **Wavetable Creation Sensitivity** parameter was added for the modes **Spectral** and **Spectral Voiced**, and the **Zone Info Bar** was added at the top. Furthermore, the **Fixed Mode** option was replaced by the new **Window Size** option, allowing you to manually specify the window size for the wavetable markers, either individually for each channel or for all channels. With the **Include Window in Range** option, you can instruct HALion to cover the entire sample when importing wavetables. See [Sample Tab](#).
- The **Spectrum Analyzer** tab was added to the **Wavetable Editor**, allowing you to show the frequency spectrum of the oscillator output. Furthermore, a channel selector is now available for the **3D Map**, **2D Wave**, and **Spectrum Analyzer** tabs. See [3D Map](#), [2D Wave](#), and [Analyzer Tabs](#).
- Several new parameters were added to the **Spectrum** tab of the **Wavetable Editor**. You can now switch the view between linear level and dB level. You can specify whether you want the frequency display to be linear or logarithmic. You can show/hide the spectral envelope, and you can set the formant resolution. Furthermore, you can copy and paste the phase spectrum across different waves, or randomize the phase spectrum. See [Spectrum Tab](#).



- The **Wavetable Editor** now contains a **Filter** tab, allowing you to apply filters to individual waves or to the entire wavetable. See [Filter Tab](#).
- The parameters **Pitch Envelope Playback** and **Channel Configuration** were added to the wavetable overview section. See [Wavetable Overview](#).

### Effects

- The REVerence effect now allows you to import and use your own impulse response files. See [REVerence](#).
- The new Bass Tape Ducking Delay effect was added in the **Delay** category. See [Bass Tape Ducking Delay](#).
- The new Studio EQ 24 effect was added in the **EQ** category. See [Studio EQ 24](#).
- The new Bass Envelope Filter effect was added in the **Filter** category. See [Bass Envelope Filter](#).
- The new Bass DI Driver effect was added in the **Distortion** category. See [Bass DI Driver](#).
- The new Bass Overdrive effect was added in the **Distortion** category. See [Bass Overdrive](#).
- The new Clipper effect was added in the **Distortion** category. See [Clipper](#).
- The new VST Bass Amp effect was added in the **Distortion** category. See [VST Bass Amp](#).
- The new Bass Octaver effect was added in the **Pitch Shift** category. See [Bass Octaver](#).
- The new Bass Chorus effect was added in the **Modulation** category. See [Bass Chorus](#).
- The new Bass Phaser effect was added in the **Modulation** category. See [Bass Phaser](#).
- The Compressor effect in the **Dynamics** category has a new **High Ratio** parameter. See [Compressor](#).
- The new Oscilloscope effect was added in the **Tools** category. See [Oscilloscope](#).

## Last but Not Least

### Section and Module Presets

- You can now step through the available presets using the new **Previous Preset/Next Preset** buttons. See [Handling Section and Module Presets](#).

### User Interface Improvements

- At the top of the **Options Editor** window, a navigation bar now allows you to show/hide and lock/unlock the different sections. Furthermore, the layout and spacing of the editor were optimized. See [Options Editor](#).

### Options Editor

- The **Performance** section in the **Options Editor** now contains the streaming settings. Furthermore, the parameter **Host Automation Resolution** has been added. See [Performance Section](#).
- In the **Edit** section, the following parameters were added: **Apply Modulation Destination Depth in Live Displays**, **Home Screen**, **Pop-up Value Meter**, **Maximum Number of Results in MediaBay/Browser**, **External Bitmap Editor**, and **External SVG Editor**. See [Edit Section](#).

### Slot Rack

- When empty slots are hidden, you can now click the plus sign under the lowest slot in the **Slot Rack** to open the **Load Program** dialog. See [Loading Programs into Slots](#).

### Loading Init Programs

- You can now load one of the available Init programs via the **Slot Rack** context menu. See [Slot Context Menu](#).

### User Icons

- You can assign your own user icons to programs, so that they are displayed in the **Slot Rack** and in the program slot section at the top of the window. See [Adding User Icons to Programs](#).

### Tagging Editor

- You can now edit the attributes of the selected program in a dedicated editor. See [Tagging Editor](#).

### Sound Editor

- In the **Sound Editor** for programs and layers, you can now show and hide the different sections. See [Managing Sections](#).

### Fingered Glide Mode

- The **Fingered** parameter has an additional option: **Any**. This allows you to glide the pitch between any new note that is played legato. See [Voice Control Section](#).

### Note-off Trigger

- You can now trigger samples at note off-events instead of at note-on events. See [Voice Control Section](#).

### Zone Editor

- The **Sample Oscillator** section now has two pages: **Mode** and **Sample**. The **AudioWarp** functions have moved to the **Mode** page. All sample-related parameters can be found on the **Sample** page. See [Sample Oscillator Section](#).

### Sample Oscillator

- You can now adjust the markers for **Loop Start**, **Loop End**, **Start Range**, and **Release Start** by dragging the corresponding marker lines in the waveform display. See [Sample Oscillator Section](#).

### Grain Oscillator Waveform Display

- You can now adjust the markers for **Loop Start**, **Loop End**, **Start Range**, and **Release Start** by dragging the corresponding marker lines in the waveform display. See [Sample Tab](#).

### Sample Editor

- The **Sample Editor** toolbar now only shows the tools for the selected tab. See [Toolbar](#).
- You can now show a spectrogram behind the waveform. See [Waveform Display](#).
- To change the sample range, you can now move the **Sample Start** and **Sample End** markers together. See [Setting up the Sample Range](#).

### Loop Range

- To change the loop range, you can now move the **Loop Start** and **Loop End** markers together. See [Setting up a Loop](#).

### MIDI Controller Assignments

- You can change the MIDI controller for a MIDI controller assignment in the **MIDI CC** editor. See [MIDI CC Editor](#).

### Program Tree

- The **Program Tree** toolbar offers a text filter to search the list. See [Program Tree Toolbar](#).
- The **Program Tree** offers a prelisten section for sample and granular zones. See [Program Tree Toolbar](#).
- You can now open the editor for the selected **Program Tree** element using the context menu command **Open Editor in New Window**. This function is also available in the **Edit** category of the **Key Commands** dialog. See [Program Tree Context Menu](#).

### Sample Import

- **Velocity \$** was added as a new **Pattern** in the **Mapping Options** section of the **Import Samples** dialog. It allows you to import samples that only contain the high velocity in the file name. See [Import Samples Dialog](#).



### Parameter List

- A filter bar has been added to the parameter list, allowing you to search for parameters containing specific text strings. See [Toolbar](#).

### Library Creator

- **Clear Sub Preset Names** was added to the **Options** section. This allows you to remove all sub preset names from all sub preset selectors before creating a VST 3 preset container. See [Options](#).

### Trigger Pads

- You can create MIDI parts from the chords that are assigned to trigger pads by dragging the pads into your DAW. See [Creating MIDI parts from Trigger Pads](#).

### Browser

- The **Browser** has been redesigned to allow for an easier and quicker search for files. The **Filter by Sound Component** pop-up menu was added to the toolbar of the results list. See [Toolbar](#).

# Introduction

This is the **Operation Manual** for Steinberg's HALion. Here you will find detailed information about all the features and functions in the application.

## Typographical Conventions

In our documentation, we use structural and markup elements to present information according to its purpose.

### Structural Elements

#### Prerequisite

Describes any actions or conditions you must have fulfilled before starting a procedure.

#### Procedure

Lists the steps that you must take to achieve a specific result.

#### Important

Informs you about serious issues; for example, issues that affect the system, the connected hardware, or that risk data loss.

#### Note

Informs you about issues or other relevant information.

#### Tip

Adds further information or useful suggestions.

#### Example

Provides you with an example.

#### Result

Describes the result of the procedure.

#### After Completing This Task

Informs you about actions or tasks that you can perform after completing the procedure.

#### Related Links

Lists related topics that you can find in this documentation.

### Markup

Bold text indicates the name of a menu, option, function, dialog, window, and so on.

---

#### EXAMPLE

In the header of the plug-in panel, click the **Preset Management** button next to the preset name field, and select **Load Preset**.

---



If bold text is separated by a greater-than symbol, this indicates a sequence of different menus to open.

---

EXAMPLE

To save a specific layer, right-click it, and select **Load/Save > Save Layer As**.

---

File names and folder paths are shown in a different font.

---

EXAMPLE

`example_file.txt`

---

## Key Commands

Many of the default key commands, also known as keyboard shortcuts, use modifier keys, some of which are specific to each operating system.

Whenever key commands with modifier keys are described in this manual, the Windows modifier key is indicated first, followed by the macOS modifier key and the key.

---

EXAMPLE

**Ctrl/Cmd-Z** means: press **Ctrl** on Windows or **Cmd** on macOS, then press **Z**.

---

## How To Contact Us

Click the Steinberg logo in the top right corner of the control panel to open a pop-up menu which includes information on how to contact us and to receive help.

- This menu contains links to various Steinberg web pages. Select a link to open the corresponding page. On the web pages, you can find support and compatibility information, answers to frequently asked questions, links for downloading new drivers, etc.

## About the Documentation

The documentation is available at <http://www.steinberg.help>.

- To visit [steinberg.help](http://www.steinberg.help), enter **steinberg.help** in the address bar of your web browser or open HALion, click the Steinberg logo in the top right corner, and select **HALion Help**.
- You can find documentation for the HALion scripting features, additional parameter descriptions regarding the **Macro Page Designer**, tutorials and parameter references at <https://developer.steinberg.help>. Note that this part of the documentation is only available in English.

## Setting Up

You can use HALion as a plug-in for a number of host applications. Depending on the host application, you might have to make additional settings, or you might be restricted to a reduced parameter set, number of outputs, etc.

NOTE

HALion can also be used as a standalone application.

---

## Selecting Outputs

By default, HALion loads with a stereo output configuration. However, you can use up to 32 stereo outputs plus one 5.1 output in the Steinberg DAW. This allows you to route all 64 program slots to a dedicated channel in the **MixConsole**.

---

### PROCEDURE

1. To make the outputs available in the VST instrument, open the **VST Instruments** window.
  2. Click the **Activate Outputs** button for the instrument.
  3. Activate the outputs that you want to use.
- 

### RESULT

The Steinberg DAW automatically adds an output channel for each additional output to the **MixConsole**. You can now route programs or layers to these outputs for further signal processing within the DAW.

## Using the Instrument in an AU-Compatible Application

The AU version of HALion is installed in your AU plug-ins folder and enables you to use HALion in an AU environment without any performance loss or incompatibilities.

For example, to load HALion as an AU instrument in Logic Pro, proceed as follows:

---

### PROCEDURE

1. Open the Track Mixer, and select the instrument channel that you want to use.
  2. Click in the **I/O** field, and select **AU Instruments > Steinberg > HALion**.
  3. Select one of the available channel configurations.
- 

## Using the Instrument in an AAX-Compatible Application

The AAX version of HALion is installed in your AAX plug-ins folder and makes HALion available as an AAX instrument in ProTools.

You can load HALion as a stereo multichannel plug-in or use HALion's surround output.

---

### PROCEDURE

1. To use HALion as a stereo multichannel plug-in, open the **Track** menu, and select **New > Stereo > Instrument Track**.
  2. To use HALion's surround output, open the **Track** menu, and select **New > 5.1 > Instrument Track**.
  3. On the instrument track, click **Inserts**, and select HALion from the **multichannel plug-in > Instrument** submenus.
-



## Using the Instrument as a Standalone Application

HALion can be used as a standalone application, independently of any host application. In this case, you can connect the instrument directly to your audio hardware.

### RELATED LINKS

[Using the Standalone Version of the Plug-in](#) on page 678

# HALion Control Panel

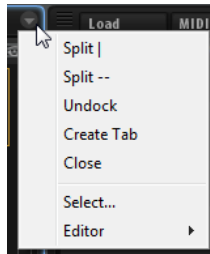
HALion provides flexible and highly customizable window management options. You can arrange the available editors in the window, structure the window sections using tabs, and configure several separate windows for your work. The size of each window and window section is individually adjustable. This allows you to make the most of the available screen space.

## Setup Options

You can configure the control panel using the setup options.

To open the menu that contains the setup options, proceed as follows:

- For views, click the **Setup Options** icon in the header.



- For tabs, right-click the name of the tab to open the context menu that contains the setup options.

### Split | and Split --

You can add a view or tab to the window by splitting an existing view or tab.

- To perform a vertical split, select **Split |**. This adds a new editor to the right of the current editor.
- To perform a horizontal split, select **Split --**. This adds an editor below the current editor.

### NOTE

To create a copy of an existing view or tab, click its upper left corner, and drag it to another position in the window. A colored frame indicates the insert position.

### Undock

Creates a duplicate of the view or tab in a new window.

### Create Tab

Creates a tab. You can also create tabs within tabs.

### Rename

Allows you to rename tabs.

### Close

Removes the view or tab.

### Select

Opens a pane that shows icons for the available editors. To select an editor, click its icon.

### Editor

Allows you to select the editor to be displayed from the list of available editors.

## View and Tab Operations

You can add, move, and resize tabs and views to configure the control panel.

### Creating Tabs

You can create tabs in the following ways:

- Select **Create Tab** from the setup options.
- Click in the upper left corner of an existing view or tab, and drag it onto another one.
- Click the + icon to the right of the rightmost tab, and click the icon for the editor that you want to display.

#### NOTE

- You can also create tabs within tabs.
- If a view contains more tabs than can be displayed, arrow buttons are displayed to navigate between the tabs.

### Moving Views and Tabs

- To move a view or tab, hold down **Shift**, click in its upper left corner, and drag it to another position.  
Depending on the drop position, it is added as a tab or as part of a split view.

### Expanding and Resizing Editor Sections

Some editors, such as the **Options Editor**, contain expandable sections. These sections can be resized or collapsed so that they only show their title bar. This helps you to save space and focus on the edited parameters.

- To expand or collapse a section, click the + or - icon on the left of the title bar, or click the title bar.
- To expand or collapse all sections at the same time, hold down **Shift**, and click the + or the - icon or the title bar.
- To resize a section, click the dotted line in the middle of its lower border, and drag up or down.

### Adjusting the Size of a Split View

- To adjust the size of two split views, point the mouse at the divider between them, click, and drag.  
If a view is split into three or more parts, these parts are resized proportionally. To resize an individual part, hold down **Ctrl/Cmd** and drag.

## Available Editors

The editors give you access to the parameters of HALion and its programs and modules.



### Automation

Lists all assigned automation parameters. With the tabs at the top, you can specify whether you want to show the automation parameters for the slot, the global parameters, or all automation parameters.

### Browser

Allows you to browse and import files, including external sampler formats.

### Keyboard

Combines a keyboard, two wheels, and the sphere control. You can use these controls to simulate external hardware.

### Library Creator

Allows you to create your own VST Sound content in HALion.

### Macro Page

Shows the macro page of the loaded program and its layers, if available.

### Macro Page Designer

Allows you to create your own macro pages.

### Mapping Editor

Allows you to specify and visualize how samples are distributed over the keyboard and velocity range.

### MediaBay

Allows you to load programs and layers.

### MIDI Editor

Allows you to configure the ranges and MIDI parameters of the slots.

### MIDI Ctrl

Lists all assigned MIDI controllers.

### MIDI Modules Editor

Allows you to edit MIDI modules, such as FlexPhrasers or MegaTrig modules.

### Mixer

Allows you to mix the program slots, access the output and AUX busses, and manage effects.



### **Options**

Contains global plug-in settings regarding the overall performance, global edit functions, and MIDI controllers.

### **Parameter List**

Gives you a detailed overview of the parameters of the selected element in the **Program Tree**. For example, if you select an effect in the **Program Tree**, only the parameters of that effect are shown.

### **Program Table**

Shows all loaded programs. This includes the programs that are used in the **Slot Rack** as well as those that are loaded via MIDI program change.

### **Program Tree**

Allows you to create programs by combining samples, layers, busses, and MIDI and audio effects.

### **Quick Controls**

Allows you to remote-control any parameter within the program.

### **Sample Recorder**

The **Sample Recorder** allows you to record samples in HALion.

### **Sample Editor**

Allows you to define sample and loop parameters.

### **Slot Rack**

Allows you to load and manage loaded programs.

### **Sound Editor**

Gives you access to the parameters of the various program components. It can display the parameters of programs, layers, zones, MIDI modules, busses, and effects. Which parameters are displayed depends on the object that is selected in the **Program Tree**.

### **Tags**

Opens the **Tagging Editor** where you can set up or edit attributes for your programs.

### **Trigger Pads**

Allow you to assign and trigger notes and chords. Furthermore, it is possible to use the trigger pads to switch between FlexPhraser or arpeggiator variations.

### **Undo History**

Lists all of your actions and allows you to undo changes.

### **Wavetable Editor**

Allows you to make settings for the wavetable synthesizer that is used by wavetable zones.

### **Zone Editor**

Allows you to edit the parameters of all zones of the focused layer simultaneously, including any sublayers. If zones are selected in the **Program Tree** or the **Mapping Editor**, only these zones can be modified.

#### RELATED LINKS

[Slot Rack](#) on page 62

[MIDI Editor](#) on page 273

[Program Tree](#) on page 292


[Editing Programs and Layers](#) on page 103

- [Editing Zones](#) on page 115
- [MIDI Modules Reference](#) on page 621
- [Mapping Editor](#) on page 93
- [Editing Samples in the Sample Editor](#) on page 221
- [Wavetable Editor](#) on page 249
- [Sample Recorder](#) on page 334
- [Macro Page Designer](#) on page 502
- [Mixer Window](#) on page 279
- [Keyboard Editor](#) on page 32
- [Quick Controls](#) on page 33
- [Trigger Pads](#) on page 634
- [Loading and Managing Programs via the Program Table](#) on page 288
- [Parameter List](#) on page 331
- [Automation Editor](#) on page 51
- [MIDI Controllers](#) on page 275
- [Tagging Editor](#) on page 80

## Screen Sets

You can save the control panel setup as a screen set. This allows you to configure HALion for different workflows and editing situations.

HALion comes with a set of screen sets for different setups and work scenarios.

- To load, save, and delete screen sets, click the **Load/Save/Delete Screen Set**  button on the toolbar in the plug-in functions section, and select a screen set or the corresponding command from the pop-up menu.

### NOTE

Factory screen sets cannot be deleted.

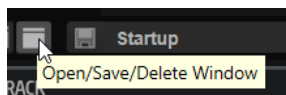
---

## Opening Additional Windows

You can open new windows that are based on presets, or you can create new windows by dragging existing views or tabs out of the window.

### CHOICES

- To open a window preset, click **Open/Save/Delete Window** in the plug-in functions section, and select the preset from the pop-up menu.



HALion comes with several preconfigured window presets.

- To open a window from a view or a tab, do one of the following:
  - Click in the upper left corner of an existing view or tab, and drag it out of the current window.
  - Use the **Undock** command on the tab context menu or the **View** pop-up menu.

This opens the editor in a new window.

NOTE

Creating a new window in this way does not remove the tab or view from the original window.

---

## Locking Windows

If you open an additional window, HALion shows the settings of the focused program, layer, zone, etc. This way, all editors and separate windows relate to the same material. However, in some cases it might be necessary to show different objects in different windows, for example, to compare the parameter sets of two zones or layers. This can be achieved by locking a window.

---

CHOICES

- To lock a window, click the **Lock** button in the upper right corner.
- 

RESULT

The window no longer follows selection and focus changes in the main plug-in window. Instead, it displays the settings of the program that was selected when you clicked the **Lock** button.

## Setting the Focus

It is important to know which view, window, or tab has the focus. The focused section of the window is the area to which your actions, such as key commands, are applied. The view that has the focus is indicated by a blue frame.

---

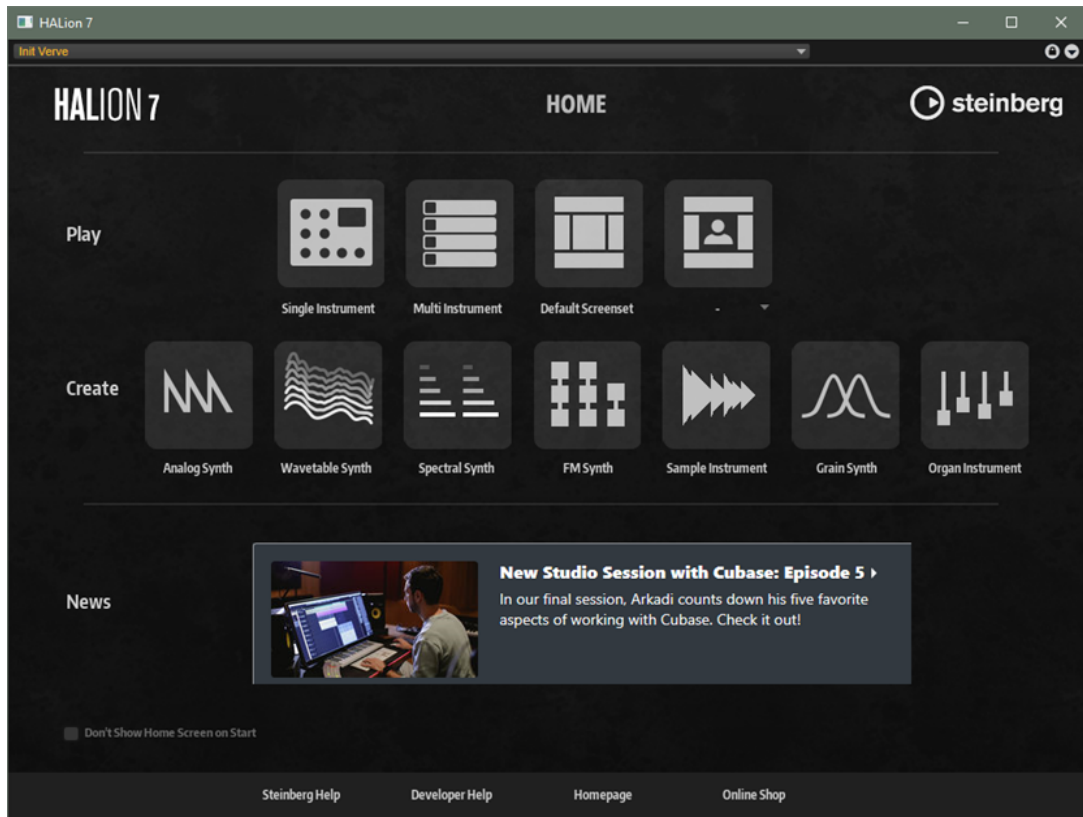
CHOICES

- To set the focus on a specific view, use one of its controls, edit a parameter, or click on the frame or in an empty background of a view.
- 

## Home Screen

When HALion is loaded and the user interface opens, the **Home Screen** is shown. This window helps you to find a good starting point for your work, so that you do not have to set up the window from scratch each time you start a new project.

In the **Home Screen**, you can select a screen set, create a program that is based on a particular layer type, visit the Steinberg websites, or watch Steinberg videos on YouTube.



## Play

In this section, you can choose from different screen sets.

- **Single Instrument** is useful if you want to load and play one sound per plug-in instance.
- Use **Multi Instrument** if you want to load and play multiple sounds within one plug-in instance, either to create complex sounds containing multiple layers or to use HALion as a multi-mode sound device.
- **Default Screenset** loads the factory default screen set.
- **User Screen Set** allows you to select one of your user screen sets.

## Create

In this section, you can open the Init programs for the available sound sources. Init programs are templates that contain the necessary settings and components for the selected synth engine or instrument sound source. They allow you to get started without having to configure the program and the HALion window first.

## News

Here, you can find useful information about new expansions or new video tutorials.

## Bottom Section

### Don't Show Home Screen on Start

Activate this option if you do not want to see the **Home Screen** when you open HALion. You can open it at any time via the **Show Home Screen** button on the toolbar.



**Steinberg Help**

Opens the website containing the documentation for all Steinberg products.

**Developer Help**

Opens an English-only Confluence page where you can find the documentation for the HALion scripting features, as well as additional parameter descriptions regarding the **Macro Page Designer**.

**Homepage**

Opens the main Steinberg website.

**Online Shop**

Opens the Steinberg online shop.

RELATED LINKS

[Screen Sets](#) on page 18

[Programs, Layers, and Multi-Programs](#) on page 54

# Common Editing Methods

Some common controls and concepts exist throughout the program. For example, presets can be used in several different sections and contexts, but their handling is always the same.

## Knobs and Sliders

Knobs and sliders can be unidirectional or bidirectional. Unidirectional values, for example, level values, start at a minimum value and go up to the maximum. Bidirectional controls start from the middle position and go to the left for negative and to the right for positive values.

Most of the editing methods are the same for knobs and sliders.

- Move the mouse over a knob or its parameter name to show the current parameter value. You can adjust the value with the mouse wheel or enter a new value manually.
- To adjust a value, click a knob or a slider and drag up and down, or use the mouse wheel. If you press **Alt/Opt** when clicking a knob, a small slider appears, allowing you to set the parameter.
- To make fine adjustments, press **Shift**, and move the knob or use the mouse wheel.
- To restore the default value for a parameter, press **Ctrl/Cmd**, and click on the control.

## Multi Selection and Parameter Controls

If several zones are selected and they are not set to the exact same values, most of the controls indicate this by turning red. This is true for knobs, on/off buttons, combo boxes, value fields, and text faders.

For example, if you have selected 3 zones with cutoff frequency values of 1200, 1400, and 2500 Hz, the corona of the frequency encoders shows a range from 1200 to 2500. The corresponding field shows the value of the focused zone in red.

### NOTE

More complex controls, such as the envelope editors, only show the values of the focused zone.

## Adjusting Value Ranges

You can adjust the value range of a parameter using the corona of the encoder. The values for the zones are distributed within the new range, keeping their relative distances.

- To compress or expand the value range, drag the corona.
- To adjust the upper limit of the range, hold down **Ctrl/Cmd**, and drag the corona.
- To adjust the lower limit of the range, hold down **Alt/Opt**, and drag the corona.

## Buttons

HALion contains two different types of buttons: **On/Off** buttons and push buttons.

### On/Off Buttons

These buttons have two states: on and off. If you move the mouse over an **On/Off** button, it changes its appearance to show that you can click it.

### Push Buttons

Push buttons trigger an action and then go back to their inactive state. These buttons open menus or file dialogs.

## Value Fields

You can enter or edit values in the available value fields using your keyboard or mouse. To enter key ranges or the root key, for example, you can use an external MIDI keyboard.

To set a value, you have the following possibilities:

- Double-click in a value field, enter a new value, and press **Return**.  
If the entered value exceeds the parameter range, it is automatically set to the maximum or the minimum value, respectively.
- Click in the value field, and drag up or down.

#### NOTE

If **Pop-up Value Meter** is activated in the **Edit** section of the **Options Editor**, a meter is shown below the text field when you edit the values. This helps you to see where the current setting is situated in relation to the value range of the parameter, and whether the parameter is unipolar or bipolar.

- Position the mouse over a value field, and use the mouse wheel.
- Click the up/down triangles next to the field.
- To set the parameter to its default value, **Ctrl/Cmd**-click the value field.
- To use a fader to adjust the value, **Alt/Opt**-click a value field.
- To enter musical values, such as key ranges or the root key, with your MIDI keyboard, double-click the value field, press a key on your MIDI keyboard, and press **Return**.
- To navigate to the next parameter, press **Tab**. To jump backwards to the previous parameter, press **Shift-Tab**.

If no parameter is selected inside the focused view, pressing **Tab** always jumps to the first parameter.

#### RELATED LINKS

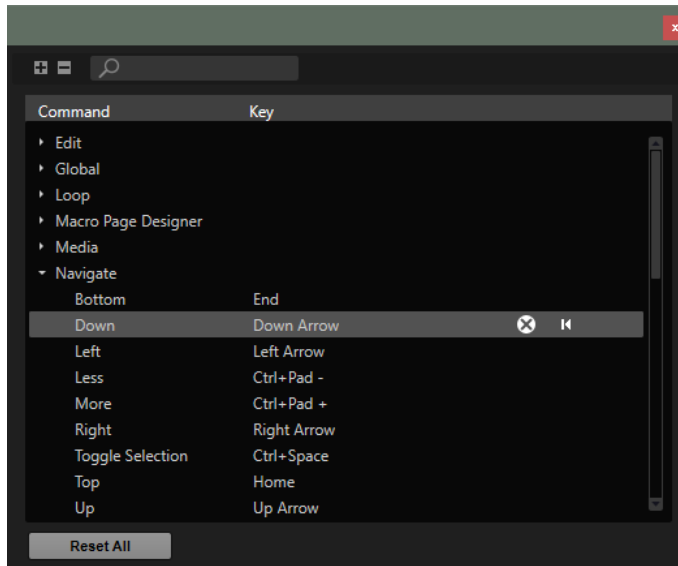
[Edit Section](#) on page 44



## Key Commands Dialog

The **Key Commands** dialog allows you to view and edit key commands for the main menus and functions in HALion.

To open the **Key Commands** dialog, open the **Options Editor**, and click the **Key Commands** button in the **Edit** section.

The commands are arranged in a hierarchical folder structure on the left. When you open a category folder, the items and functions are displayed with their currently assigned key commands.



- To set up a key command, select the function in the list, and enter the key command in the **Key** column. If this key command is already used for another function, a warning message is shown.
- To delete a key command, select the function in the list, and click the **Remove Key Command**  button.
- To reset a key command to its default, select the function in the list, and click the **Reset Key Command**  button.
- To search for a specific function, enter its name or part of the name in the search field at the top of the dialog.  
While you type, the list is updated to show only the matching functions.
- To reset all key commands to their default settings, click **Reset All** at the bottom of the dialog.

## Presets

HALion offers two types of presets: section/module presets and VST presets. Section and module presets store and recall the setup of a specific component on the HALion panel. VST presets contain all information necessary to restore the complete state of the plug-in.

During setup, the factory presets are installed in a dedicated folder, and a user folder is created for your own presets. The handling of presets is the same throughout the program.

NOTE

Factory presets are write-protected, but may be overwritten when a software update is executed. Presets in your user folder are never changed by the software update.

---

## Handling Section and Module Presets

Many modules and editors come with a range of presets and allow you to save your settings as user presets.

For example, these presets are found in several sections of the **Zone Editor**, in the effect panels, in several MIDI modules, etc.

---




CHOICES

- To save a preset, click **Save** .

NOTE

You cannot overwrite factory presets. If you want to save changes made to a factory preset, save the preset under a new name or in a new location.

---

- To load a preset, click the arrow icon, and select a preset from the list.
- To step through the available presets, click **Previous Preset** /**Next Preset** , if available.
- To delete a preset, click **Delete** .

NOTE

You cannot delete factory presets.

---

## Handling VST Presets

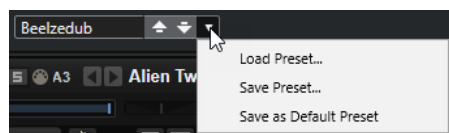
VST presets are used wherever you can load programs, multi-programs, or layers in HALion, that is, in the program header, the multi slot section, the **Slot Rack**, the **Program Tree**, etc.

VST presets have the file name extension `.vstpreset`. They are managed via the **MediaBay**.

---

CHOICES

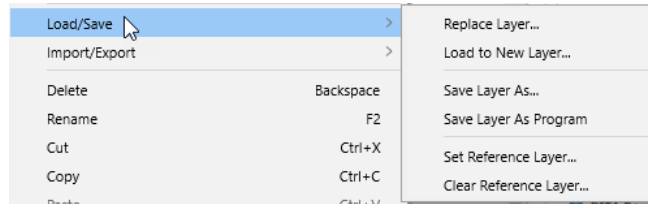
- To load a preset, do one of the following:
  - In the plug-in header, click **Preset Management** to the right of the preset name field, select **Load Preset**, and select a preset.



- In the multi slot section, click **Load Multi-Program**, and select a preset.
- In the **Slot Rack**, click the **Load Program** button for a slot, and select a preset.
- Drag a VST preset from the **MediaBay** or the file browser onto a slot in the **Slot Rack**. If the slot already contains a program, this program is replaced.
- Drag a VST preset from the **MediaBay** or the file browser onto the **Program Tree**. Drop it on a program or layer to replace this program or layer. Drop it between two layers to add it to the layers in the **Program Tree**.



- Right-click the program or layer for which you want to insert the VST preset, select **Load/Save > Load to new Layer**, select the VST preset, and click **OK**.
- To replace a program or layer, right-click it in the **Program Tree**, on the **Load/Save** submenu, select **Replace Program** or **Replace Layer**, and select the VST preset that you want to use.
- To save a preset, do one of the following:
  - In the plug-in header, click **Preset Management** to the right of the preset name field, select **Save Preset**, make your settings in the save dialog, and click **OK**.
  - Right-click a program or layer in the **Program Tree**, open the **Load/Save** submenu, select a save option, make your settings in the save dialog, and click **OK**.



- In the multi slot section, click **Save Multi-Program**, make your settings in the dialog, and click **OK**.
-

# Global Functions and Settings

In the plug-in functions section, on the toolbar, and on the **Options Editor**, you can find global functions and settings for HALion.

## Plug-in Functions Section

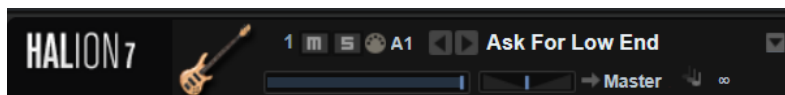
The plug-in functions section at the top of the window gives you access to global functions that affect both the currently loaded programs and the general working of the plug-in.

The plug-in functions section contains the multi slot section, the program slot section, the master section, and the performance displays.

The toolbar below the plug-in functions section contains controls for managing multi-programs and screen sets.

## Program Slot Section

This section contains a copy of the slot that is selected in the **Slot Rack**, as well as the main parameters of the program.



The slot parameters are the same as in the **Slot Rack**, with the following addition:

### Slot Number



The number of the active slot. You can switch to another slot by clicking the slot number and selecting an entry from the list.

### Load Previous Program/Load Next Program



Loads the previous/next program.

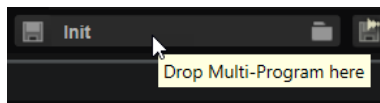
The list of programs depends on the **MediaBay** filter that is active for the slot. For example, if you set the filter to show only bass sounds and double-click a sound to load it, you can use the **Load Previous Program/Load Next Program** buttons to step through the filtered list of bass sounds for the slot.

### RELATED LINKS

[Slot Controls](#) on page 63

## Multi Slot Section

In the multi slot section on the left, you can load and save multi-programs, manage the default multi-program, and clear the entire plug-in instance.



### Load Multi-Program



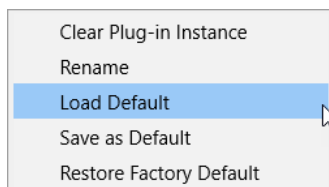
Opens a window that allows you to load multi-programs.

### Save Multi-Program



Opens a window that allows you to save your settings as a multi-program.

### Context Menu



### Clear Plug-in Instance

Resets the entire plug-in instance to an empty state.

### Rename

Allows you to rename the current multi-program.

### Load Default

Loads the default multi preset.

### Save as Default

Allows you to save the current multi as the default multi preset.

This includes the loaded programs, the active page, the current size and position of the plug-in window, etc.

### Restore Factory Default

Restores the factory default multi preset.

### NOTE

The default preset that can be set in the Cubase plug-in header overrides the default multi preset in HALion. To use the HALion multi preset instead, right-click the preset field in the plugin-header, and select **Remove Default Preset**.

---

## Master Section

The master section can be used to set the volume and for the tuning of the plug-in.



### Master Volume

Adjusts the overall volume of the plug-in.

### Master Tune

You can set the **Master Tune** slider from 415.3 Hz to 466.2 Hz, which equals -100 cents to +100 cents.

## Performance Displays

The meters and text displays indicate the system load of the plug-in.



### CPU

This meter shows the processor load during playback. The more voices you play, the higher the processor load. If the overload indicator lights up, reduce the **Max Voices** setting on the **Options** page.

### Disk

This meter shows the hard disk transfer load during the streaming of samples or when loading presets. If the overload indicator lights up, the hard disk is not supplying data fast enough. In such a case, open the **Options** page and adjust the **Disk vs. RAM** slider towards **RAM** or decrease the **Max Voices** setting.

### Polyphony



This display indicates the number of samples that are currently played back, to help you trace performance problems. For example, if you have to reduce the **Max Voices** setting on the **Options** page, you can verify your settings by monitoring the number of samples that are currently playing.

### Memory

This display indicates the overall amount of RAM that is currently used by the plug-in and the loaded programs. The number refers to the streaming buffer and the preloaded samples. The **MEM** display helps you trace performance problems. For example, if you need to free up memory for other applications, you can adjust the **Disk vs. RAM** slider on the **Options** page toward **Disk**. You can verify your settings by monitoring the **MEM** display.

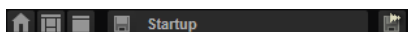
## Plug-in Name and Steinberg Logo

To obtain information regarding the version and build number of the plug-in, click the plug-in logo. This opens the **About** box. To close the **About** box, click it, or press **Esc** on your computer keyboard.

If you click the Steinberg logo in the top right corner of the plug-in interface, a pop-up menu opens. Select one of the options to navigate to Steinberg web pages containing information on software updates, troubleshooting, etc.

## Toolbar

The toolbar below the plug-in functions section contains controls for loading multi-programs, for switching between different screen sets, for opening the home screen, and for various useful global functions.



### Show Home Screen

Opens the **Home Screen**, a window where you can select and open a screen set, create a program based on a template, find links to Steinberg websites and news, and more.

### Load/Save/Delete Screen Set

Allows you to load, save, and delete screen sets.

#### NOTE

Factory presets cannot be deleted.

---

### Open/Save/Delete Window

Allows you to open, save, and delete combinations of windows.

### Save Multi-Program

Saves the current set of programs as a multi-program.

### Load Multi-Program

Allows you to navigate to and load a multi-program.

### Export Multi-Program as VST 3 Preset with Files

Allows you to export the current set of programs together with all required files as VST 3 presets. This way, you can transfer a complete multi-program to another computer, for example.

#### NOTE

Programs that use samples from VST Sound containers cannot be exported.

---



### Missing Busses

Opens the **Pending Busses** dialog, allowing you to resolve issues concerning bus connections.

### Find Missing Samples

Opens the **Find Missing Samples** dialog, allowing you to locate any missing samples for the loaded program.

### Global insert, AUX, and FlexPhraser buttons

Use these buttons to switch off all insert effects, AUX effects, and FlexPhrasers for the whole plug-in at once. You can use this to compare sounds with and without effects or to use a preset without the FlexPhrasers, for example.

### RAM Save

Allows you to unload unused samples.

### Enable MIDI Mapping Selection Options

If this button is activated, played MIDI notes can be used to select zones. This also influences the zone parameters that are displayed in the editors.

#### NOTE

This parameter is linked to the corresponding option in the **Mapping Editor**, allowing you to remote-control the option, even if the **Mapping Editor** is not visible.

---



### Script Error Indicator/Reset

Lights up if errors occur in a Lua script used by the program. You can click the button to reload and initialize the script. However, if the problems persist, you must repair the script.

### MIDI Reset

Click this button to stop playback and reset all MIDI controllers to their default values.

### Undo/Redo

To undo or redo a single operation, click the **Undo** or **Redo** buttons. To undo or redo multiple operations, click the arrow next to the button to open the history, and select the step to which you want to return.

#### NOTE

The number of available undo/redo operations depends on the **Undo Steps** setting on the **Options** page.

---

### Show/Hide Load Panel

Opens the **Load** panel on the right side of the window.

#### RELATED LINKS

[Unloading Unused Samples](#) on page 31

[Screen Sets](#) on page 18

## Unloading Unused Samples

The **RAM Save** function scans the playback of your project and unloads unused samples.

---

#### PROCEDURE

1. Click **RAM Save** on the toolbar. In the dialog, click **Yes** to start collecting the necessary samples.

The **RAM Save** button starts blinking.

2. Play back the project in your host application from the beginning to the end or to the point where no new notes are played.

**RAM Save** always keeps samples that are within the range between the highest and the lowest note of the played programs. This also applies for unused expression layers that can be controlled via key switches. This allows you to switch between expressions within the valid note range after applying **RAM Save** mode.

#### IMPORTANT

If a program randomly triggers notes, for example, different guitar slide noises, it is possible that these notes are not triggered during the **RAM Save** analysis process, and that the samples are therefore removed. To prevent this, trigger the highest required note manually during the analysis.

---

3. Click the **RAM Save** button again. In the dialog, click **Yes**.
- 

#### RESULT

The unused samples are unloaded.

To deactivate **RAM Save** and reload the unused samples, click the **RAM Save** button again.

## Keyboard Editor

The **Keyboard Editor** contains the wheel controls, the sphere control, and the internal keyboard.



### Wheel Controls

To the left of the internal keyboard, the pitchbend wheel and the modulation wheel are located.

The modulation wheel is hardwired to MIDI controller #1, which is normally used as a source in the modulation matrix, but can be used as a quick control as well.

Typically, you assign the modulation wheel to a parameter of an insert effect, such as the speed of the Rotary effect.

### Internal Keyboard

The internal keyboard in HALion spans the entire MIDI note range from C-2 to G8. You can use it to trigger notes by playing them, but you can also drop samples onto it to import and map samples, for example.

You can resize the internal keyboard horizontally and vertically. A vertical resize changes the size of the individual keys and a horizontal resize defines how many octaves are visible. If the horizontal size is not sufficient to display all octaves, you can use the left/right arrow buttons on both sides of the keys to shift the visible range by octaves.

For each key, the keyboard indicates whether a sample is mapped to it.

The following color scheme is used for the keys:

- Keys to which a key switch is assigned are shown in yellow.
- Keys to which a remapped key switch is assigned are shown in beige.
- Keys to which an expression in the **Layer Alternate** MIDI module is assigned are shown in red.
- Keys that are assigned to a trigger pad are shown in blue.
- Keys to which a loop trigger note is assigned are shown in green.

#### NOTE

The descriptions above refer to the default color scheme for the internal keyboard. However, it is possible to write or use Lua scripts that use different colors.

---

### Previewing Notes Using the Keyboard

- To preview a note, click the corresponding key on the keyboard.  
The vertical position where you click a key defines the velocity that is used to trigger the note. Click the lower part of a key to use the highest velocity, and the upper part to use the lowest velocity.
- To play a key and all following keys at the same velocity, for as long as you keep the mouse button pressed, hold down **Ctrl/Cmd**, and click the key on the keyboard.
- To play each note 10 times at increasing velocities between 1 and 127, hold down **Ctrl/Cmd - Alt/Opt**, and click a key.

## Keyboard Context Menu

Right-click a key to open a context menu that contains information about the key.

- The **Assigned Zones** submenu displays the names of all zones that are mapped to this key, allowing you to select a zone.
- The **Info** submenu shows pitch and velocity information.
- Select **Clear key** to remove all assignments.

## Sphere Control

The sphere is a two-dimensional control. It allows you to adjust two parameters simultaneously, by dragging the mouse horizontally (**Sphere H**) and vertically (**Sphere V**). Typically, two parameters that belong together are assigned to the sphere, such as cutoff and resonance.

If parameters are assigned to **Sphere H** and **Sphere V**, triangles for indicating the horizontal and vertical axis are available.

You can reset the sphere to the center position using the corresponding options on the context menu.

- If **Center Horizontal** and/or **Center Vertical** are activated, the sphere returns to the corresponding center position as soon as you release the mouse button.

## Quick Controls

Quick controls allow you to remote-control any parameter inside the program.



Quick controls can be set up for programs and for layers. If a layer has no quick controls, the quick controls of the program are used. If a layer has quick controls, the layer and all its zones use these quick controls.

For each program and layer, eight quick controls are available. Furthermore, **Sphere H**, **Sphere V**, and the modulation wheel can also serve as quick controls.

If a layer contains zones, these zones are also affected by the quick controls of the layer.

To hear a sound without quick control assignments, you can bypass them temporarily by using the **Bypass** button to the right of the quick controls. This turns off the quick control assignments of the program.

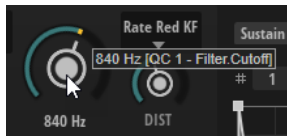
The quick controls can be accessed via the **Quick Control Assignments** section for a program or layer.

### RELATED LINKS

[Quick Control Assignments Section](#) on page 36

## Value Tooltips

Parameters that are assigned to a quick control can show a value tooltip. This value tooltip indicates the resulting parameter value and the name of the assigned quick control.



This is useful, because if you use quick controls, the following situations can happen:

- The actual value of a parameter and the value that is displayed in its value field differ.
- A button on the user interface is deactivated, but the corresponding parameter is active.

For example, this can happen if the quick control introduces an offset or if a button is controlled by a quick control.

- To activate/deactivate value tooltips, click **Value Tooltips** in the **Edit** section of the **Options Editor**.

### RELATED LINKS

[Edit Section](#) on page 44

## Assigning Quick Controls

You can assign quick controls to a parameter of the program or one of its layers, to zones inside a program or layer, or to parameters of a MIDI module or an effect.

---

### PROCEDURE

1. In the **Program Tree**, select the element that you want to remote-control via a quick control.
2. Open the **Sound Editor**.
3. Right-click the control to which you want to assign a quick control, and on the **Assign Quick Control** submenu, select a quick control.

You can assign the same quick control to different parameters. This allows you to make complex sound settings with a single control. However, you cannot assign different quick controls to the same parameter.

### NOTE

You can also assign a quick control as a modulation source or modulation modifier in the modulation matrix. This allows you to combine the quick control with other modulation sources.

---

### RELATED LINKS

[Modulation Sources](#) on page 210

## Setting the Minimum/Maximum Range

You can set the minimum and maximum range for each assignment separately. This gives you better control over the parameter change.

- Right-click a control, and define the range using the **Set Minimum** and **Set Maximum** commands.

- In the **Quick Control Assignments** editor, enter the values in the **Minimum Value** and **Maximum Value** fields, or click and drag the handles in the curve display.

## Trimming the Range

The **Trim Range** function allows you to automatically set the best quick control range, depending on the current parameter value.

---

### PROCEDURE

- In the **Quick Control Assignments** editor, right-click the assignment in the list on the right.
  - To trim the range of a single assignment, select **Trim Range**.
  - To trim the range of all quick controls, select **Trim Range of All Quick Controls**.

---

### RESULT

The minimum and maximum values are set automatically.

### NOTE

If you change the original parameter, you have to apply the **Trim Range** function again to ensure the best control range.

---

## Setting the Default Range

---

### PROCEDURE

- In the **Quick Control Assignments** editor, right-click the assignment on the right.
  - To set the default range of a single assignment, select **Set Default Range**.
  - To set the default range of all quick controls, select **Set Default Range of All Quick Controls**.

---

### RESULT

The quick controls are set to their maximum possible range.

### NOTE

If you change the original parameter, you must apply the **Set Default Range** function again to ensure the best control range.

---

## Unassigning Quick Controls

- To remove a quick control assignment, right-click the parameter in the **Quick Control Assignments** editor, and select **Remove Assignment**.
- To remove all assignments of the selected quick control, open the context menu, and select **Remove All Assignments**.
- To remove all quick control assignments of all quick controls that belong to the selected layer in the **Program Tree**, open the context menu, and select **Remove All Assignments of All Quick Controls**.

## Single Assignment vs. Multi Assignment

You can assign a quick control to a single parameter of a zone or module. This is called a single assignment. Alternatively, you can assign a quick control to the same parameter of all zones inside a layer. This is called a multi assignment.

### NOTE

Single assignments override multi assignments.

### EXAMPLE

If a quick control remote-controls the **Cutoff** parameter of all zones inside a layer and you assign the **Cutoff** parameter of one of these zones to another quick control, the multi assignment is overridden by this single assignment.

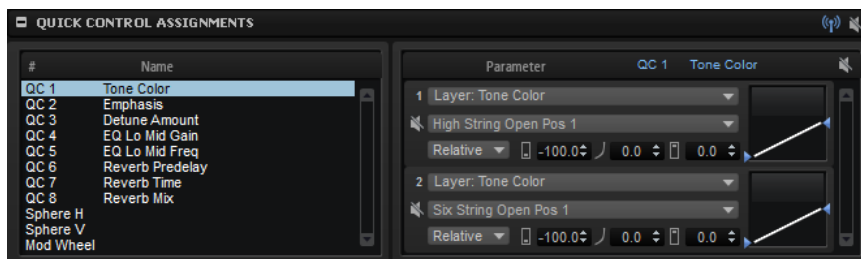
If you remove a single assignment from a parameter of a zone that is part of a layer that has a multi assignment on the same parameter of all other zones, the zone becomes part of the multi assignment again.

If you add another zone to a layer that has a multi assignment, the added zone assumes the same quick control assignments as the other zones of that layer.

## Quick Control Assignments Section

This section allows you to manage and edit the assigned quick controls.

The eight quick controls are listed on the left. The assignments of the selected quick control are listed on the right. You can edit the parameters for each assignment separately.

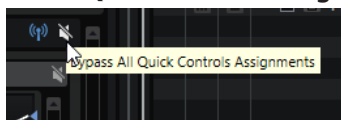


### Receive Quick Controls

This button on the title bar of the **Quick Control Assignments** section can be used as a filter for quick controls. If **Receive Quick Controls** is deactivated for a layer, its quick controls are not routed any further, that is, any layers, zones, etc., that come after this layer are not affected by the quick controls.

For example, if you have a guitar sound and you assign quick controls to the amplifier envelope, you want them to affect the entire instrument, except for the fret noises. In this case, deactivate **Receive Quick Controls** for the layer that contains the fret noises, so that these remain unaffected by the amp envelope.

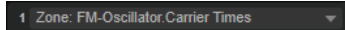
### Bypass All Quick Controls Assignments



Allows you to bypass all quick control assignments for a program or layer. This is useful if you want to hear a sound without quick control assignments.

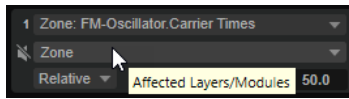


### Quick Control Parameter



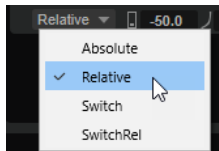
Displays the parameter assignment for the selected quick control.

### Affected Layers/Modules



Displays which program, layer, or module is affected by the quick control.

### Mode



Determines the mode that is used for changing the parameter values.

- **Absolute** remote-controls the parameter values continuously. **Absolute** mode changes the assigned parameters by overwriting them with the current quick control value, that is, parameter changes are overwritten.
- **Relative** remote-controls the parameter values continuously. **Relative** mode changes the values of the assigned parameters without losing their relative settings, that is, parameter changes are still audible.
- **Switch Absolute** switches between the minimum and maximum value. Parameter changes are overwritten.
- **Switch Relative** switches between the minimum and maximum value. Parameter changes are still audible.

### Minimum Value



Sets the minimum value for the quick control assignment.

### Curvature



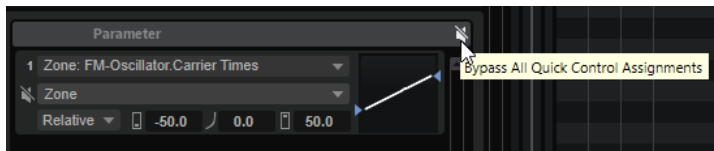
Sets the curvature. You can also set the curvature by clicking and dragging in the curve display.

### Maximum Value



Sets the maximum value for the quick control assignment.

### Bypass All Quick Control Assignments



Bypasses all assignments for the selected quick control.

### RELATED LINKS

[Quick Controls](#) on page 33

## Managing Quick Controls

The **Quick Control Assignments** editor allows you to manage and edit assigned quick controls.

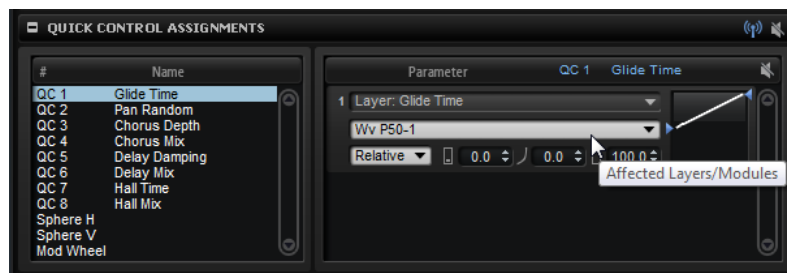
- To rename a quick control, click in the **Name** column, and enter a new name.
- To duplicate a quick control assignment, open the context menu for the quick control, and select **Duplicate Assignment**.
- To change the order of quick control assignments, drag an assignment between two other quick controls. When a line is shown, release the mouse button to insert the quick control assignment.
- To replace a quick control assignment, drag it onto another quick control. When a rectangle is shown, release the mouse button to replace the quick control assignment.
- To assign a quick control to another parameter, click the parameter name, and select a new parameter from the menu.

You can only select parameters within the same layer, zone, or module.

- To transfer all quick control assignments of a layer to the program, select the layer in the **Program Tree**, open the context menu of the **Quick Control Assignments** section, and select **Forward All Assignments to Program**.

## Scope for Quick Control Assignments

If quick controls are assigned to a layer, all zones inside this layer respond to the quick controls as well. In the **Quick Control Assignments** editor, you can change the scope of each quick control, that is, you can specify which layers or modules it affects.



The pop-up menu in the middle of each assignment row displays which part of the program is affected by this quick control assignment. If the name of a zone or module is displayed here, only that zone or module is affected by the quick control assignment. If the name of the program or one of its layers is displayed, all zones inside the program or the layer are affected. You can choose the part of the program to be affected by selecting an option from the pop-up menu.


If a quick control is assigned to a parameter of the program or one of its layers, the scope of that assignment is that program or layer only. Any layers from deeper hierarchy levels are not affected by the quick control.

## Receiving Quick Controls

You can specify whether to address all zones or only selected zones within a layer with the quick controls.

### PROCEDURE

1. In the **Program Tree**, select the program or layer that you want to respond to the quick controls.

2. In the **Sound Editor**, in the **Quick Control Assignments** section, activate **Receive Quick Controls** .

---

#### RESULT

Now, zones inside layers respond to quick controls. This includes any single and multi assignment to zones.

#### NOTE

Quick control assignments that belong to the layer itself are not affected. This is useful if you have assigned quick controls to the entire program and you want to exclude parts of it, such as the layer containing the instrument noises, for example.

---

## Adjusting the Curvature

You can adjust the curvature of each individual assignment in the **Quick Control Assignments** editor.

---

#### PROCEDURE

- To adjust the curvature, do one of the following:
    - Select the quick control that you want to edit, and specify a value in the **Curvature** value field.  
Positive values change the curvature towards logarithmic behavior, and negative values change it towards exponential behavior.
    - Click and drag the curvature in the display on the right.
- 

## Quick Control Assignment Modes

A quick control behaves either like a continuous control or like a switch. In addition, it remote-controls a parameter either in relative or absolute mode. You can specify a mode for each assignment.

You can set the behavior via the context menu for the control itself or via the pop-up menu in the **Quick Control Assignments** editor.

#### Absolute

Remote-controls the parameter values continuously. **Absolute** mode changes the assigned parameters by overwriting them with the current quick control value, that is, parameter changes are overwritten.

#### Relative

Remote-controls the parameter values continuously. **Relative** mode changes the values of the assigned parameters without losing their relative settings, that is, parameter changes are still audible.

#### Switch Absolute

Switches between the minimum and maximum value. Parameter changes are overwritten.

#### Switch Relative

Switches between the minimum and maximum value. Parameter changes are still audible.

## Neutral Setting

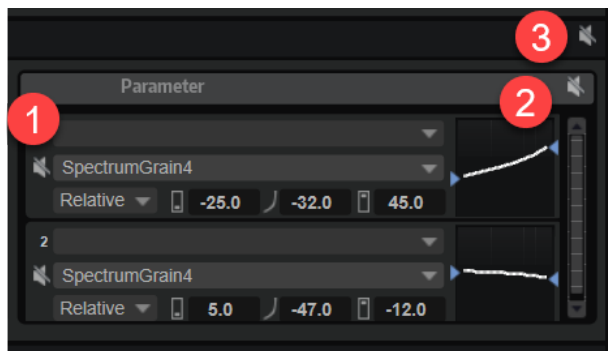
If you adjust the range of a quick control assignment, it can become necessary to change its neutral setting, to prevent the resulting sound from changing.

If you adjust the range of a quick control with a single assignment that uses **Absolute** or **Relative** mode, HALion automatically adjusts the setting of the quick control so that the sound does not change. Likewise, if you assign multiple parameters to the same quick control, HALion automatically sets the range of this quick control assignment.

However, if a quick control has multiple assignments and you change the range of one or more assignments, the neutral setting cannot be set automatically. In this case, you can specify the neutral setting manually using the **Set Quick Control to Neutral Setting** command on the context menu for the quick control.

## Bypassing Quick Controls

Bypassing quick controls allows you to hear a sound without quick control assignments.



- 1 To bypass a single assignment for one quick control, click **Bypass Single Quick Control Assignment** in the **Quick Control Assignments** editor.
- 2 To bypass all assignments for one quick control, select the quick control in the **Quick Control Assignments** editor, and click **Bypass All Quick Control Assignments** in the upper right of the parameter section.
- 3 To bypass all quick control assignments of a program or layer, select the program or layer in the **Program Tree**, and click **Bypass All Quick Controls Assignments** in the title bar of the **Quick Control Assignments** editor.

## Assigning Quick Controls in the Modulation Matrix

In addition to assigning quick controls directly to parameter controls, you can also assign them as a source or modifier in the modulation matrix. This way, you can combine the quick control with other modulation sources.

---

### PROCEDURE

1. In the **Program Tree**, select the zones that you want to edit.  
Make sure that the zones are part of the program or layer containing the quick controls that you want to use.
2. In the **Sound Editor**, open the **Modulation Matrix** section.
3. On the pop-up menu in the **Source/Modifier** column, open the **Assign Quick Control** submenu, and select the quick control.

The submenu lists only the quick controls that belong to the same layer or that are on a higher hierarchy level.

---

## Options Editor

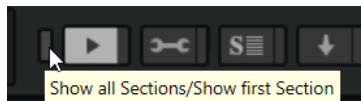
The **Options Editor** contains global settings regarding performance optimization, global functions, MIDI controllers, etc.

At the top of the **Options Editor**, you can find the buttons that show the available sections: **Performance**, **Edit**, **Scripting**, **Import**, **MIDI Controller**, and **Performance Meter**. By default, the first section is shown.



- To show a section, click the corresponding button.  
By default, only one section is shown. If you click another section button, the current section is replaced by the new section.
- To show all sections at the same time, click the **Show all Sections/Show first Section** button to the left of the section buttons.


This switches between the display of all sections and the first section.

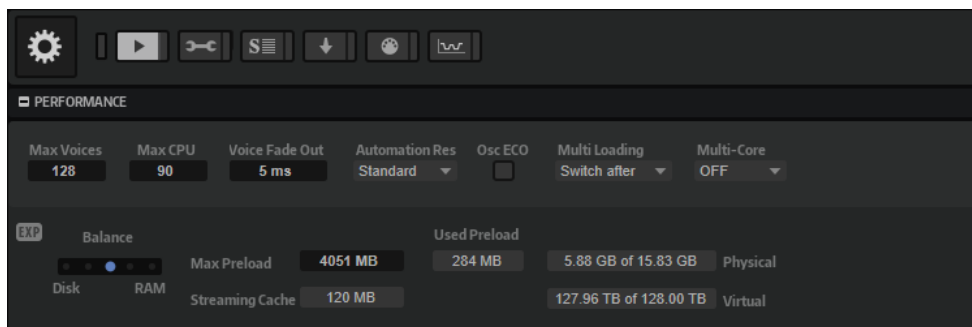


- To show several sections at the same time, activate their **Lock Section** buttons to the right of the section button.



## Performance Section

The **Performance**  section contains settings to optimize the overall CPU performance of the plug-in.



### Max Voices

Determines the total number of voices that a plug-in instance can play back. As soon as this limit is reached, HALion starts stealing voices.

### Max CPU

To avoid clicks or audio dropouts from CPU overloads, you can specify a limit for the CPU load of the plug-in instance. HALion automatically steals voices when this limit is exceeded. With a setting of 100%, this parameter is deactivated.

#### NOTE

The reaction time of the plug-in may result in CPU peaks that exceed the set limit. This can lead to artifacts, such as audio drop-outs. Therefore, it is good practice to set the **Max CPU** setting to a value slightly lower than actually needed.

---

### Voice Fade Out

Sets the time to fade out voices that need to be stolen because the **Max Voices** setting or the **Max CPU** setting has been reached.

### Host Automation Resolution

Allows you to specify the resolution at which incoming automation data is processed. The **Standard** setting provides a good balance between accuracy and performance, **High** increases the resolution by a factor of four. This improves accuracy but increases performance requirements.

#### NOTE

This parameter only takes effect when working with large audio block sizes, such as 512 or 1024 samples. When working with smaller block sizes such as 256, 128 or below, the quality of the automation processing automatically increases. Larger block sizes are also used for tracks that are played through Cubase **ASIO guard**.

---

### Osc ECO Mode

Activate this option to run the oscillators of synth layers in ECO mode. In ECO mode, the oscillators use less CPU at the cost of producing more aliasing at higher pitches. If this option is activated, you can play more voices with synth layers.

### Multi Loading

Normally, when loading multi-programs, the previous multi-program is kept in the RAM until the new multi-program has been loaded completely.

- To clear a multi-program before loading a new one, select **Clear before** from the pop-up menu.

### Multi-Core

Via this pop-up menu, you can specify how many of the available CPU cores of your system can be used by the plug-in. This allows HALion to compute each program on a different core, for example. The best setting depends on multiple factors and varies from system to system and from project to project. A good starting point is to set this value to one core less than the available number of cores.

#### NOTE

If you encounter any issues, reduce the number of cores, or set the pop-up menu to **Off**, and load multiple instances of HALion instead. This way, the host application distributes the work load among the available cores.

---

Some of the programs come with several gigabytes of samples. Due to this large amount of data, your computer cannot load all samples completely into the RAM, especially if you are using all slots. Therefore, HALion loads only the initial milliseconds of each sample into RAM. You



can specify how much RAM to use and how much you want HALion to rely on accessing the hard-disk.

### Balancing Disk vs. RAM

Use the **Balance** slider to balance the hard disk versus the RAM usage.

- If you need more RAM for other applications, drag the slider to the left, towards the **Disk** setting.
- If your hard disk is not supplying data fast enough, drag the slider to the right, towards the **RAM** setting.

#### NOTE

The **Disk vs. RAM** setting applies to all plug-in instances. It is not saved with the project.

---

### Used Preload and Available Memory

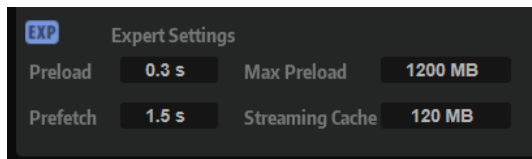
These displays provide information on the memory load in MB, based on the balance slider setting.

### Max Preload

Determines the maximum amount of RAM that HALion uses for preloading samples. In most cases, the default values are sufficient. However, it may become necessary to reduce this value, for example, when working with other applications or plug-ins that require a lot of memory.


### Expert Mode (EXP)

Activate **Expert Mode** if you want to adjust the **Disk Streaming** settings in greater detail.



- **Preload Time** defines how much of the start of the samples is preloaded into the RAM. Larger values allow for more samples to be triggered within a short period of time.
- **Prefetch Time** determines the read-ahead capacity into the RAM while streaming samples for a voice that is playing. Larger values allow for better transfer rates from disk, and usually for more voices. However, this requires a larger streaming cache in RAM. If you increase the **Prefetch Time**, we recommend to also increase the **Streaming Cache**.
- **Streaming Cache** determines the amount of RAM that is reserved for prefetching. The required size depends on the **Prefetch Time**, the number of voices streamed simultaneously, and the audio format of the samples. For example, higher sample and bit rates need more RAM.

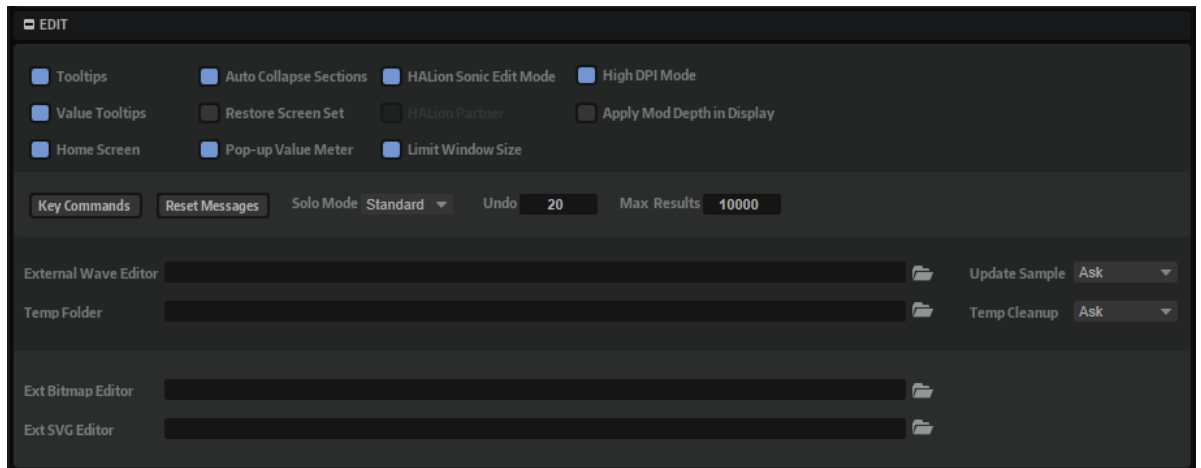
## Edit Section

In the **Edit**  section, you find common settings for HALion, and you can specify an external wave editor for editing your samples.

### NOTE

The settings in this section are not saved with a project but affect the entire plug-in.

---



### Show Tooltips

If this option is activated, a tooltip is shown when you move the mouse over a control.

### Show Value Tooltips

If this option is activated, parameters without a value field display their value in a tooltip when you use the corresponding control.

### Home Screen

If this option is activated, the home screen is shown when you open a new HALion instance.

### Auto Collapse Sections

If this option is activated and you expand a section, all other sections are automatically collapsed.

### Restore Screen Set

Restores the corresponding screen set when you load a multi-program.

### NOTE

In a VST 2 or AU environment, screen sets and windows are always restored when loading a multi-program.

---

### Pop-up Value Meter

If this option is activated, a meter is shown below the text field when you edit the values. This helps you to see where the current setting is situated in relation to the value range of the parameter and whether the parameter is unipolar or bipolar.

### HALion Sonic Edit Mode

This mode allows you to edit a HALion Sonic preset in HALion and then save it in its original preset format, so that it can be opened in the plug-in that it was created in.

If this mode is activated and you load a preset, all layers, busses, effects, and other modules that are required by HALion Sonic cannot be deleted or replaced, in order to ensure the compatibility with this program version. However, you can modify the parameter values of these elements.

Furthermore, if you are working with layers that were created in HALion 6/HALion Sonic 3 or later, you can make structural changes within the four HALion Sonic layers, that is, you can add, remove, or replace sublayers, zones, or other modules within these layers.

To indicate that a preset is in **HALion Sonic Edit Mode**, the **HS** button in the **Program Tree** toolbar is activated.



### HALion Partner

When you work with a HALion Partner license, activating this option allows you to use the HALion Partner-specific features.

#### NOTE

If you change this setting, you must re-instantiate the plug-in for the changes to become effective.

---

### Limit Window Size

Limits the size of the plug-in window to fit in the available screen space. Activate this option if the display of your laptop or your computer monitor cannot fully display the plug-in. With this option activated, a scroll bar is displayed in the plug-in window, which allows you to navigate to areas outside the visible area.

### High DPI Mode

- If **High DPI Mode** is activated, the plug-in uses high-resolution bitmaps when it is displayed with a scaling of 150% or higher on a high-resolution monitor, such as 4K (UHD), 5K, etc. This allows for sharper images on high-resolution displays.

#### NOTE

Windows systems currently only support scaling factors that are multiples of 100. For example, if you use a scaling factor of 150%, in HALion, the scaling factor is set to 200%.

**High DPI Mode** may not be compatible with some combinations of software and hardware. If you experience display issues with your setup, you can deactivate **High DPI Mode**.

---

- If **High DPI Mode** is deactivated, the native monitor resolution is used.

### Apply Modulation Destination Depth in Live Displays

Allows for modulation signal displays in the modulation assignments to take the **Depth** parameter into account. If this option is deactivated, the modulation signal is displayed with the full scale as it is produced by the source.

### Key Commands

Opens the **Key Commands** dialog, where you can view and assign key commands.

### Reset Messages

If you click this button, all message dialogs that have been suppressed with the **Don't Show Again** option are displayed again.

### Solo Mode

- In **Standard** mode, you can solo multiple programs or layers to hear them combined.
- In **Exclusive** mode, only one program or layer can be soloed at a time.

### Number of Undo Steps

Specifies the number of available undo steps.

### Maximum Number of Results in MediaBay/Browser

Specifies the maximum number of results displayed in the results list of the **MediaBay/Browser**.

### External Wave Editor

HALion allows you to specify an external sample editor application that can be used to perform destructive offline editing on a sample, for example applying EQs, filtering, or denoising.

With the **External Wave Editor** parameter, you specify which application to use. You can enter the path manually or click the **Browse** button to navigate to the corresponding application folder.

#### NOTE

You can only edit your user samples in an external editor. Factory samples are write-protected and cannot be edited.

### Update Sample

Specifies what happens if a sample is saved in the external wave editor.

- If **Ask** is selected and you switch back to HALion from the external editor, you are asked whether you want to replace the current sample with the modified sample.
- If **Always** is selected, HALion accepts the modified sample.
- If **With Backup** is selected, HALion accepts the modified sample and automatically creates a backup of the previous sample file.
- If **Never** is selected, modified samples are never accepted automatically. You must import modified samples manually from the temp folder.

### Temp Folder

Allows you to specify a temp folder for exchanging samples between HALion and the external editor.

### Temp Cleanup

After a specific period of time, HALion deletes temporary sample files from the temp folder. The **Temp Cleanup** option allows you to make settings for this process.

- If **Ask** is selected, you are prompted to confirm the cleanup of the temp folder.
- If **Always** is selected, temporary files are deleted without further notice. If a file cannot be deleted, an error message is shown.
- If **Ignore Error** is selected, temporary files are removed without further notice. If a file cannot be deleted, no error message is shown.
- If **Never** is selected, temporary files are never deleted automatically. You must delete them manually.

### External Bitmap Editor

Allows you to specify which program to open when using the **Edit** command on a Bitmap resource in the **Macro Page Designer**.

### External SVG Editor


Allows you to specify which program to open when using the **Edit** command on an SVG resource in the **Macro Page Designer**.

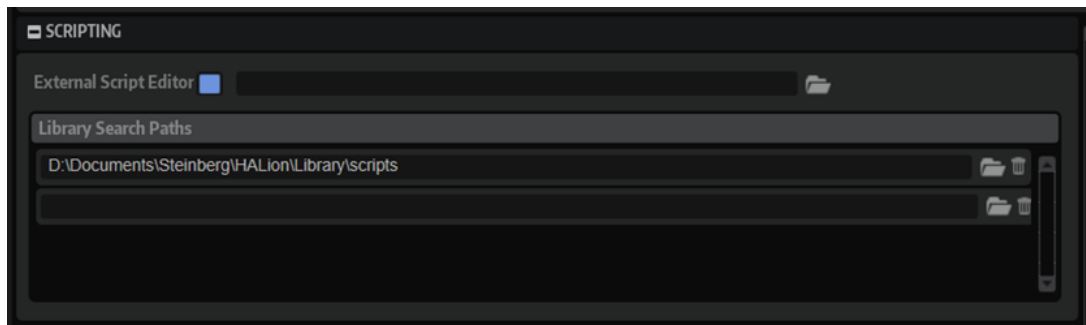
#### RELATED LINKS

[Home Screen](#) on page 19

[Key Commands Dialog](#) on page 24

## Scripting Section

In the **Scripting**  section, you can set up and activate an external script editor and specify where you want HALion to search for script libraries.



### Use External Script Editor

Activates/Deactivates the external editor.


### Library Search Paths

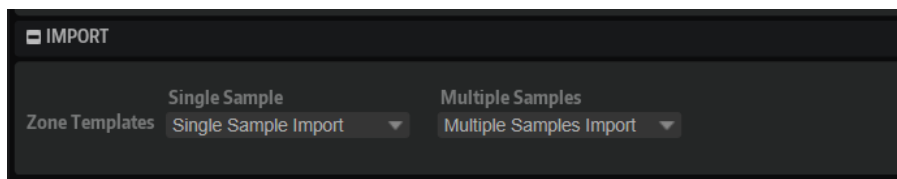
These paths are used by all script modules to search for libraries.

#### RELATED LINKS

[Setting Up an External Editor](#) on page 674

## Import Section

In the **Import**  section, you can specify which zone templates to use when importing samples.



### Single Sample

Determines which zone template is used when importing single samples.

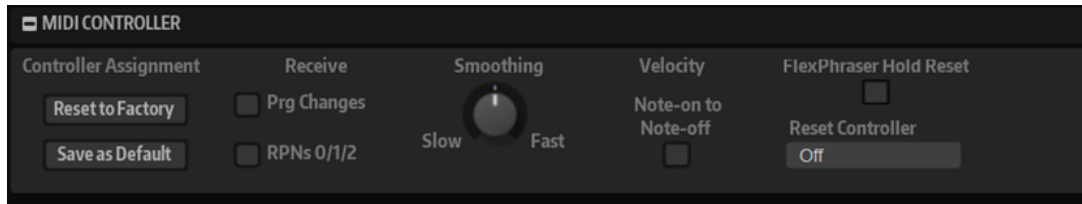
### Multiple Samples

Determines which zone template is used when importing multiple samples.

For example, by specifying different headroom settings for single and multiple samples, you can import single drum loop samples without headroom and multiple instrument samples including their headroom settings, because they are required for polyphonic playback.

## MIDI Controller Section

In the **MIDI Controller**  section, you can set up how HALion handles MIDI controllers.



### Controller Assignment

With the two buttons in this section, you can save your customized MIDI controller assignments as defaults or restore the factory MIDI controller assignments.

#### NOTE

**Save as Default** does not include any of the MIDI controller assignments of the AUX FX.

The current MIDI controller mapping is also saved with each project. This way, you can transfer your settings to other systems. The project includes the MIDI controller assignments of the AUX FX as well.

### Receive

- If **Receive MIDI Program Changes** is activated, HALion responds to program change messages. These are used by General MIDI (GM) files, for example.
- GM files can contain information about the pitchbend range, coarse tuning, and fine tuning. This information is transmitted as RPNs (Registered Parameter Numbers). If **Receive RPNs 0/1/2** is activated, HALion responds to RPNs.

### MIDI Controller Smoothing

MIDI controllers have a maximum resolution of 128 steps. As a result, if you use a MIDI controller as a modulation source in the modulation matrix or to remote-control a quick control, the parameter change may occur in audible steps, causing an effect often referred to as “zipper noise”. To avoid this, HALion provides MIDI controller smoothing, so that parameter changes occur more gradually.

- If MIDI controller changes cause audible artifacts, turn the control further to the left. This way, MIDI controller changes do not occur immediately but are spaced over a period of time (in milliseconds).
- If you want more immediate MIDI controller changes, turn the control further to the right. Note, however, that this may introduce audible artifacts.

### Velocity Note-On to Note-Off

Some keyboards do not transmit note-off velocity messages. If this option is activated, the played note-on velocity value is also used as the note-off velocity for the notes.


### FlexPhraser Hold Reset

Allows you to send a global hold reset message to all FlexPhraser modules or arpeggiators that are used.

### FlexPhraser Reset Controller

Allows you to assign a MIDI controller to the **FlexPhraser Hold Reset** button for remote-controlling it.

## Performance Meter Section

The **Performance Meter**  section provides performance-relevant information. Each meter displays the current value, the peak value, and a curve showing the changes over time.



To reset all peaks, click **Reset Peaks**  in the title bar.

### Voices

The number of played voices.

### CPU Avg Load

The average CPU load.

### CPU Peak Load

The CPU peak load.

### Streamed MB/s

The quantity of sample data that is streamed from the hard disk.

### Dropouts/s

The number of dropouts per second. This can be an indicator that a hard disk is too slow.

### Preload Memory

The quantity of samples loaded into the RAM of your computer.

## AI Knob Support

HALion can be controlled with the AI knob of Steinberg's CC121, CI 2, and CI2+ controller units.

- To change a parameter value, move the mouse pointer over the control that you want to change, and turn the AI knob to set the value.

NOTE

- Some parameters cannot be controlled by the AI knob, due to internal differences in parameter resolution. For example, sample marker positions cannot be changed with the AI knob because their ranges vary too much.
  - The AI knob only works on parameters that are automatable. This means that you cannot use the AI knob to change the parameters in the **Options Editor**, for example.
-



# Automation

You can automate most of the HALion parameters from within your host application, whether these are parameters of a program or global parameters such as AUX effects.

HALion provides 512 automation parameters that can be addressed from within the host application. You can assign HALion parameters to one of these automation parameters and even assign multiple parameters to the same automation parameter, to control them at the same time.

## NOTE

- To automate parameters of multiple zones relatively, use quick controls and automate these instead.
- Not all parameters can be automated.

## Automation Parameters

Each slot offers the following pre-assigned automation parameters:

### Mute

Automates the **Mute** button of the corresponding slot.

### Solo

Automates the **Solo** button of the corresponding slot.

### Level

Automates the level of the corresponding slot.

### Pan

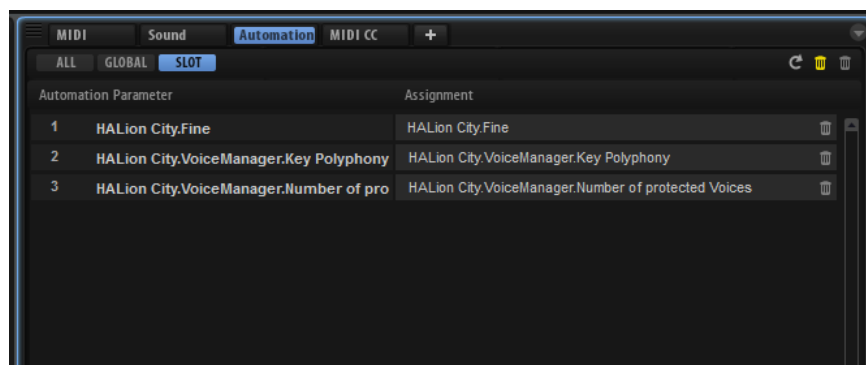
Automates the panorama position of the corresponding slot.

### Quick Controls 1-8

Automates the quick controls 1 to 8 of the program that is loaded into the slot.

## Automation Editor

All assigned automation parameters are shown in the **Automation** editor.



With the tabs at the top, you can specify whether you want to show the automation parameters for the slot, the global parameters, or all automation parameters.

On the left, the name of the automation parameter is shown, and on the right, the name of the assigned HALion parameter is displayed. If multiple HALion parameters are assigned to one automation parameter, these are listed below each other on the right.

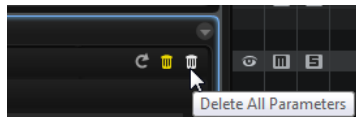
If you assign an automation parameter for multiple zones, for example, the parameter is displayed in the list in the following way:

- If all zones within a layer are selected, the automation list shows one automation parameter for all these zones.
- If several zones within a layer are selected, the automation list adds sub-entries for each zone to each automation parameter in the list.

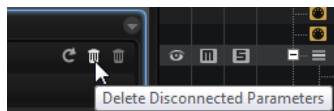
#### NOTE

You can assign a HALion parameter to an automation parameter only once. If you try to add a parameter a second time, for example, a zone parameter as part of a selection of zones, the new automation parameter is only applied to the zones in the selection that were not yet assigned to an automation parameter.

- To remove an automation parameter, click the trash icon to the right of the parameter name.
- To remove all automation parameters, click **Delete All Parameters** at the top of the page.



- To remove all disconnected automation parameters, click **Delete Disconnected Parameters** on the toolbar.



You may experience issues with disconnected automation assignments that cannot be properly connected. This can occur if you make automation settings for a program and then load another program with a different structure into a slot, for example.

- To rename an automation parameter, double-click the parameter name, and enter the new name. This name is then used in your host application.
- To replace the names for all automation parameters with the original parameter names of the program, click **Refresh All Parameter Names** on the toolbar.

## Setting Up Automation

By default, some of the slot parameters are already assigned to automation parameters, for example **Mute**, **Solo**, **Volume**, **Pan**, and **Program Change**. When you load a program, it automatically adds its automation parameters for the eight quick controls and the sphere control.

### Creating Automation Parameters

- To assign a parameter to an automation parameter, right-click the parameter control, and select **Assign to New Automation**. The automation parameter is created on the first available automation parameter.

- To add a parameter to an existing automation parameter, right-click the control, select **Add to Automation**, and select the automation parameter.
- To remove a parameter from the automation, right-click an automated control, and select **Forget Automation**.
- To assign a parameter to an automation parameter automatically while working in your host application, activate **Automation Read/Write**, start playback, and use the controls on the HALion interface.

**NOTE**

To create automation parameters only for selected zones, first select these zones or the layer that contains these zones.

---

### Assigning Parameters to Automation Parameters

The selection in the **Program Tree** determines the scope of the automation parameter, that is, which element it affects. For example, select a zone to automate this zone, and select a layer to automate all zones within this layer, etc.

**EXAMPLE**

If you assign an automation parameter to a group of zones within a layer, the incoming automation data affects all zones in the same way, and individual settings of zones are overwritten. For example, if the zones of a layer have different **Cutoff** values and you start automating the **Cutoff** parameter, the zones are all set to the same **Cutoff** value.

---

**NOTE**

If you have assigned automation parameters for a program and then load another program into this slot, it can become necessary to verify the automation settings.

If the new program has the same structure as the previous program, for example, if you exchange a Voltage preset with another Voltage preset, HALion reconnects the automation parameters correctly, and no manual modifications are necessary. However, if you load a preset with a different structure, for example a Model C preset, the automation parameters cannot be reconnected. In this case, the disconnected automation parameters are still displayed in the automation list.

---

# Managing Your Sounds

You can load, save, and manage different kinds of sound files.

## Programs, Layers, and Multi-Programs

HALion comes with a wide range of factory content and allows you to load other Steinberg content, user-generated content, or third-party libraries.

### Programs and Layers

A program is a complex instrument or sound that can consist of multiple layers. Often, a program contains a single layer that includes all necessary components, such as the synthesis part or insert effects. However, programs allow you to combine different layers, to build up more complex sounds or to create combinations of sounds that you want to load as a unit. A typical example is a bass/piano split sound or a piano/string layer sound.

Because of the various layer types that come with HALion, these combinations can do a lot more. For example, think of combining a pulsating synthesizer sequence with a sliced loop completed by a bass on the lower keys, and so on. Finally, adding some effects to individual layers or to the whole program creates a unique sound experience.

### Multi-Programs

HALion is a multitimbral plug-in that can load and combine up to 64 programs. This combination is called a multi-program. You can use multi-programs to layer several programs or to create split sounds by setting several programs to the same MIDI input channel, for example. However, the most common usage is to create sound sets with different instruments set to individual MIDI channels.

### VST Sound Instrument Sets

VST Sound Instrument Sets from Steinberg provide additional content for VST instruments based on the HALion technology. They come with their own macro pages that feature a customized look and a collection of controls and parameters. For details, refer to the documentation included with the corresponding VST Sound Instrument Set.

### Content Files and Folder Structure

HALion comes with a large amount of ready-to-use sound content, made up of hundreds of multi-programs, programs, and layers. This content is write-protected. You can edit files while they are loaded, but you cannot overwrite the factory content files.

To save edits to the factory content, save the files under a new name. These files get the file name extension `.vstpreset` and are referred to as user content. They can be searched and categorized in the same way as factory content.

User content is saved in a predefined folder structure on your hard disk. You can create subfolders within this structure to facilitate moving or exchanging content.

RELATED LINKS

[Included Instruments](#) on page 343

## Registering VST Sounds

To be able to use the content of VST Sound containers, the containers must be registered in the **MediaBay**.

You register content using the **Steinberg Library Manager**. This is a separate program that is installed together with HALion and that allows you to manage your VST Sound content. For further information, consult the **Library Manager** documentation on <https://steinberg.help/>.

## Loading Programs and Layers

You can load programs and layers via the **Program Tree**, the **MediaBay** or the **Browser**, via drag and drop onto the **Slot Rack**, and via various context menus in different areas of the plug-in.

There are several ways to load programs:

- Via drag and drop from the **MediaBay**, the **Program Table**, the **Program Tree**, or the File Explorer/macOS Finder onto a slot in the **Slot Rack**.  
To load the program into an empty slot, drag it onto an empty slot or onto the empty space below the slots in the **Slot Rack**.  
To replace the current program, drag the program onto a used slot in the **Slot Rack**.
- Via drag and drop from the **MediaBay** of your Steinberg DAW onto a slot in the **Slot Rack**.
- By clicking the **Load Program** button to the right of the slot and selecting a program in the **Load** dialog.
- By selecting **Load Program** from the slot context menu.

NOTE

Programs containing lots of sample data may take some time to load.

---

### Inserting Programs in between Slots

To add a program or layer into a new slot between two existing slots, drag it between these slots. A red line indicates the insert position.

NOTE

The slot number is taken from the first available slot and does not necessarily reflect the order in which the slots are listed.

---

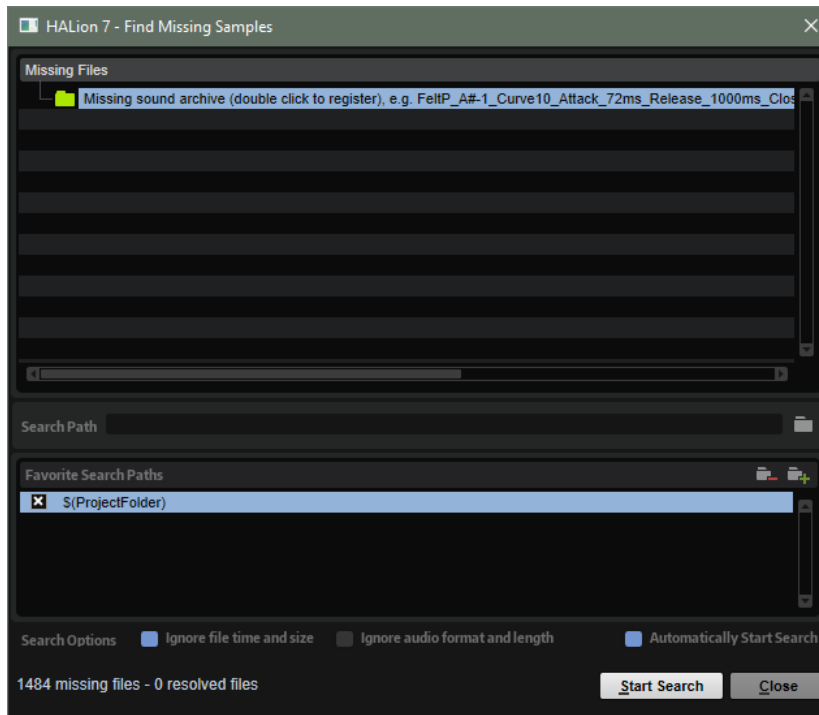
### Loading Layers into Slots

If you load a layer into a slot, HALion creates a new program.

## Finding Missing Samples

There might be situations where loaded programs cannot find the samples they use. This can happen if the referenced samples are located on a different drive and the drive name has

changed, or because the program was created on a different computer system. In this case, the **Find Missing Sample** dialog opens.



The dialog displays a list of all samples that are missing, with information regarding the format, size, and creation date.

## Search Path

Below the list of missing samples, you can enter the search path to find the missing samples.

Once you have specified the search path, click the **Start Search** button to initiate the search process.

### NOTE

All subdirectories are searched before the results are displayed. Therefore, the search takes longer if you specify entire drives.

If the search only finds a single result for each missing sample, the sample path is automatically corrected in the program, and the sample disappears from the **Missing Files** list. If all samples are found, the dialog is closed.

If sample files with the same name are found in more than one location, an additional **Found Files** list appears below the **Missing Files** list. This shows the available samples and their file locations.

- To select a sample or a complete folder that is to be used to resolve the missing samples, double-click it in the **Found Files** list.  
Each sample or folder that is resolved in this way disappears from the **Missing Files** list.

## Favorite Search Paths

If a path might be helpful for future searches, you can add it to the search path list. The next time the dialog opens, it allows you to select one or multiple predefined paths to specify which places to include in the search.

- To add a path, click the + sign.

## Search Options

By default, HALion searches for samples that do not only have the same file name, but also match in terms of time, size, and format information. A sample is considered “found” only if all of the information is identical. However, you can exclude this information by activating the **Ignore File Time and Size** and **Ignore Audio Format and Length** options.

If **Automatically Start Search** is activated, the search starts automatically when the dialog opens.

# Load Dialog

The **Load** dialog allows you to load programs, layers, and multi-programs.

- To open the **Load Program** dialog, click **Load Program** at the right of the program slot.
- To open the **Load Multi-Program** dialog, click **Load Multi-Program** to the right of the multi-program slot.

The **MediaBay** and **File System** buttons at the top allow you to choose whether you want to use Steinberg’s **MediaBay** to look for files or search for files by browsing through the folders in your system.

### RELATED LINKS

[MediaBay Page](#) on page 57

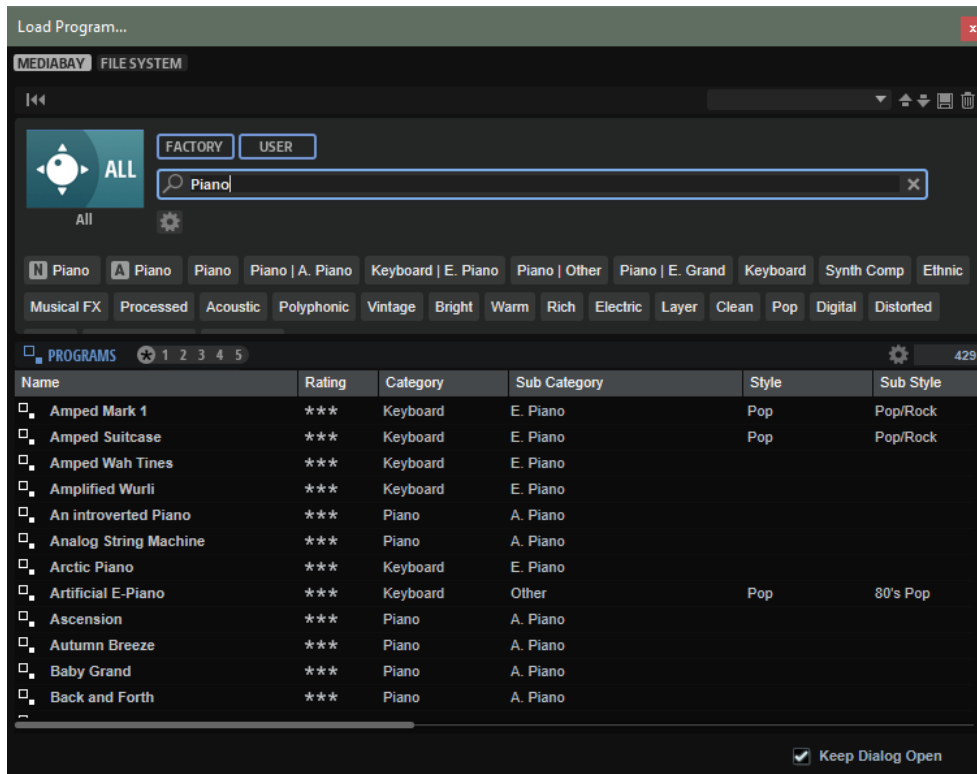
[Filtering the Results](#)

[Results List](#) on page 76

# MediaBay Page

On the **MediaBay** page, you can search for and load files. To help you find your files more quickly, you can define a library filter and an attribute filter, the results list, and much more.

In the top section of the page, you can specify which sounds to look for. The lower section shows the corresponding results.



### Reset Filter

Resets all filter settings.

### Synchronize Filter Settings with Selected Slot

- If this button is activated, selecting a program from the **Slot Rack** automatically sets the **MediaBay** search filters to the state they were in when the program was loaded. This makes it easier to replace a program with a similar program.

If you select an empty slot, all search filters are reset.

If no program, layer, or multi was loaded because you loaded the program via the **Browser** or via drag and drop from the File Explorer/macOS Finder, the search settings do not change when you select this slot.

- If this button is deactivated, the filter settings are global for all slots.

### Import FXP/FXB/HSB VST Sound

Allows you to register HSB or VST Sound files and import FXP/FXB files. This enables you to load HALion 3 presets from HSB container files, VST Sound files, or FXP/FXB files.

### Presets

You can save, load, and delete the settings of a **MediaBay** search, which includes both the search mask at the top and the results list. This allows you to create search templates for different search scenarios, for example.

Saving the **MediaBay** with active search filters allows you to create different preset collections that can then be recalled very quickly. These collections are dynamic, that is, any new presets added to your system at a later time also appear in the results list when a new search is performed.



## Search Mask and Results List

### Select Library

Click the library icon on the left to open the library selector, where you can specify which library to search for content.

### Factory

Activate this button to search for presets that are part of commercial or free libraries and that are installed on your system as VST Sound libraries. These libraries can be part of HALion or HALion Sonic, for example, or they can be included in expansion libraries.

### User

Activate this button to search for presets that you have created and saved in the **MediaBay**.

### Filter Text


In the text search field, you can enter text that is part of the name or an attribute of a preset that you are looking for. For example, if you enter **Piano**, the results list displays all presets whose name contains "Piano", or presets for which the term "Piano" is used in one of the attributes, such as the **Category** attribute **Piano** or the **Subcategory** attribute **Keyboard | E.Piano**.

### Configure Attribute Menus

Allows you to add attribute menus, where you can specify attributes for your search. The following attribute menus are available:

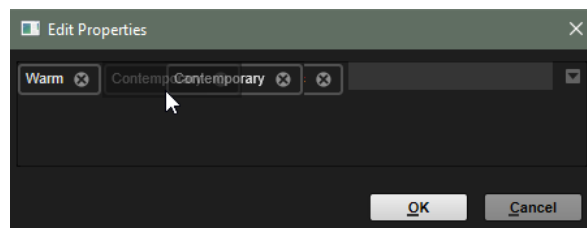
- **Category** opens a tree view that allows you to select a **Category** or a **Subcategory**. **Subcategory** tags are shown together with the corresponding **Category**, in the following way: (Category | Subcategory).
- **Style** opens a tree view which allows to select a **Style** or a **Substyle**. **Substyle** tags are shown together with the corresponding **Style**, in the following way: (Style | Substyle).
- **Properties** opens the **Properties** dialog, where you can add one or multiple **Properties** attributes.

To search for a **Properties** attribute, enter a text string in the text field, such as **warm**, for example. When you start typing, the available properties are shown and can be selected from the list. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order. By adding multiple properties, you can narrow down the results to the ones that match both properties.

Alternatively, click **Show All Attribute Values**  next to the text field to open a list of all **Properties** attributes. You can search for matching attributes by scrolling the list. Press **Return** or click a property to add it.


To add a new **Properties** attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.



- **Moods** opens the **Moods** dialog, where you can add one or more **Moods** attributes.

To search for an attribute, enter a text string in the text field, such as **energetic**, for example. When you start typing, the available properties are shown and can be selected from the list. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order. By adding multiple properties, you can narrow down the results to the ones that match both properties.


Alternatively, click **Show All Attribute Values**  next to the text field to open a list of all attribute values. You can search for matching attribute values by scrolling the list. Press **Return** or click an attribute value to add it.

To add a new **Moods** attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.



- **Articulations** opens the **Articulations** dialog, where you can add one or more **Articulations** attributes.

To search for an attribute, enter a text string in the text field, such as **Decrescendo**, for example. When you start typing, the available articulations are shown and can be selected from the list. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order. By adding multiple articulations, you can narrow down the results to the ones that match both articulations.

Alternatively, click **Show All Attribute Values**  next to the text field to open a list of all **Articulations** attributes. You can search for matching attributes by scrolling the list. Press **Return** or click an attribute to add it.

To add a new **Articulations** attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.

- **Author** opens a list with all available authors.
- **Key** opens a list with all available keys.
- **Signature** opens a list with all available signatures.
- **Tempo** opens the **Tempo** dialog, where you can select a **Tempo** and specify a **Range** in which the tempo of the result can deviate from the set tempo. Activate the **Half-Time**  or **Double-Time**  buttons to include presets that use half or double the tempo.

### Rating Filter

Allows you to limit the results list according to the rating of the presets. Use the rating slider to define the minimum rating.

### Set up Result Columns

Allows you to select which attribute columns to display in the results list.

### RELATED LINKS

[Browsing for Files](#) on page 72

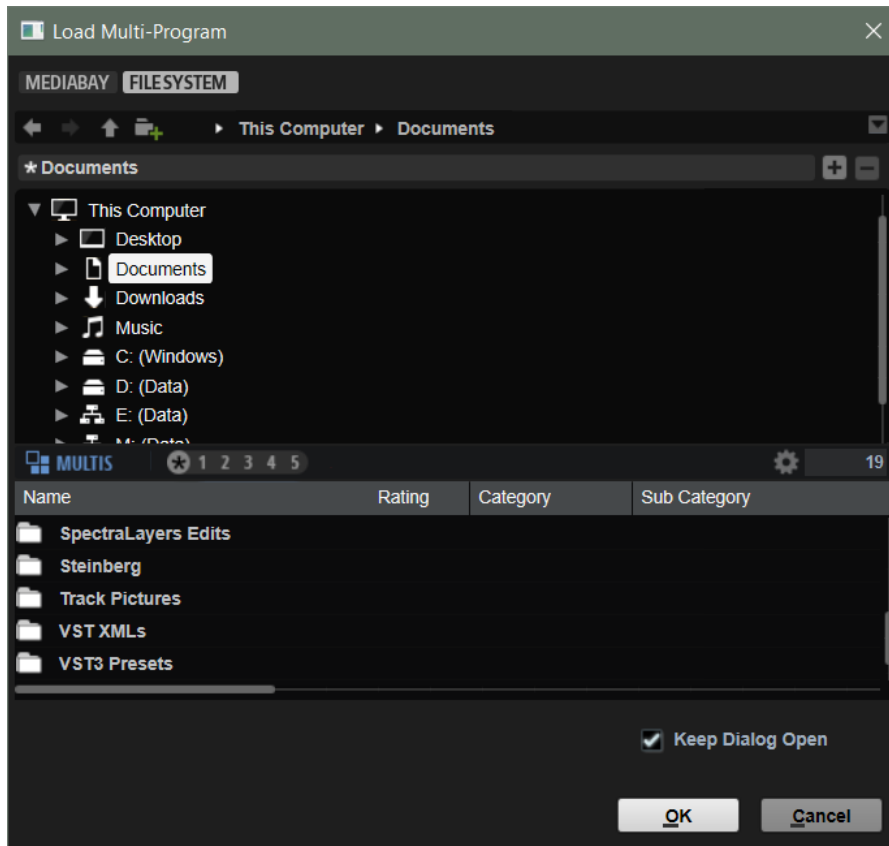
[Filtering the Results](#)

[Results List](#) on page 76

## File System Page

On the **File System** page, you can browse for files in your system.

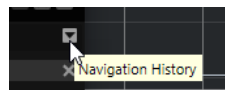
In the top section of the page, you can specify where to look for sounds. The lower section displays the corresponding results.



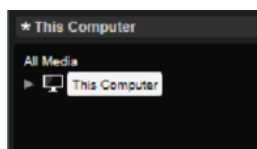
### Navigation controls



- To step through the recent locations, click the **Previous Browse Location/Next Browse Location** buttons.
- To navigate to the folder one level up in the location tree, click the **Browse Containing Folder** button.
- The path to the current position in the hierarchy is shown on the right. To navigate to one of these folders, click its name.
- To open the history, click the **Navigation History** button on the right.



### Locations



You can save folders or directories in your system as favorite locations for quick access.

- To open the list of favorite locations, click in the text field.  
If you have not created any locations yet, this list is empty.
- To add the current folder as a favorite location, click **Add Selected Media Node as Favorite Location**.  
You can keep the folder name or specify a new name for the location.
- To delete the current location from the list, click **Remove Favorite Location**.

### Rating Filter

Allows you to limit the results list according to the rating of the presets. Use the rating slider to define the minimum rating.

### Text Search

In the text search field on the results list toolbar, you can enter text contained in the name or any of the attributes of a preset that you are looking for. The results list updates in real time, and the category search section above shows all categories that contain presets matching the text search.

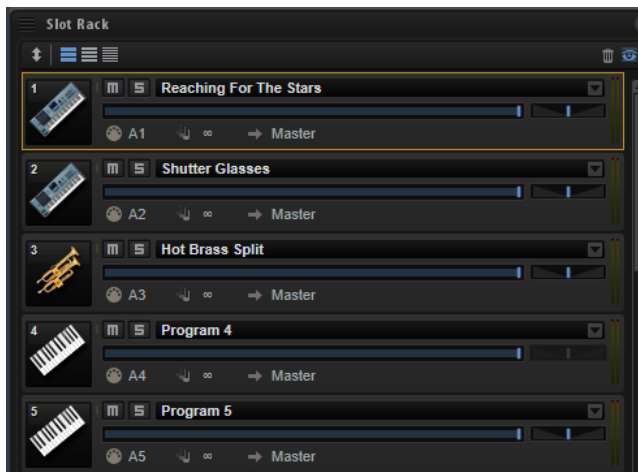
To reset the text-based result filter, click **Clear Filter Text** next to the search field.

### Set up Result Columns

Allows you to select which attribute columns to display in the results list.

## Slot Rack

The **Slot Rack** has 64 slots. Each slot can contain a program, that is, you can work with 64 programs at the same time.



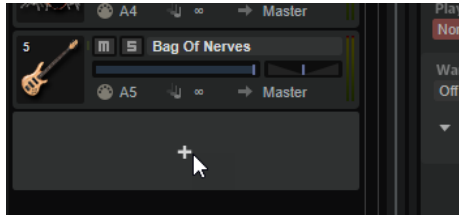
Once a program is loaded in the **Slot Rack**, it can be played and edited.

## Loading Programs into Slots

You can load programs using drag and drop and via the **Load Program** command.

### CHOICES

- Drag the program from the **MediaBay**, the **Program Table**, the **Program Tree**, or the File Explorer/macOS Finder onto the **Slot Rack**.  
To load the program into an empty slot, drag it onto this slot, or, if empty slots are not shown, drag it onto the empty space below the slots in the **Slot Rack**. To replace the current program, drag the program onto a used slot.
- Click the **Load Program** button of a slot to open the **Load Program** dialog, select a program, and double-click it.  
If the slot contains a program, this program is replaced.
- If **Show Empty Slots** is deactivated, a plus symbol is shown below the lowest slot. Click it to open the **Load Program** dialog. Select a program, and double-click it to load it into a new slot that is added below the current slots.



- Right-click in the **Slot Rack**, select **Load Program** from the context menu, and double-click a program.  
If you right-click a slot to open the context menu, the current program is replaced.  
If you click in the empty section below the slots (only shown if **Show Empty Slots** is deactivated), a new slot is added below the current slots, and the program is loaded.
- 

## Slot Rack Controls

The top section of the **Slot Rack** contains the controls.



### Sort Slots

Allows you to select the sorting mode.

- **Custom Sorting** – Allows you to define the order by dragging the slots up or down.
- **Sort Slots by MIDI Port and Channel** – Sorts the slots according to their MIDI port and MIDI channel.
- **Sort Slots by Index** – Sorts the slots according to their slot index.

### Slot Size Buttons

Allow you to show large, medium, or small slots. The larger the slot, the more controls are displayed.

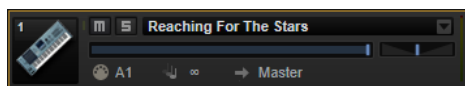
### Remove All Programs

Removes all programs that are loaded in the **Slot Rack**.

### Show Empty Slots

By default, the **Slot Rack** only shows slots that contain programs. Activate **Show Empty Slots** to show all 64 slots.

## Slot Controls



For the slots in the **Slot Rack**, the following controls are available:

### Program Icon

Indicates the sound category that is set for a program (if applicable).

### Mute

Deactivates playback of the program.

### Solo

Solos the corresponding program. Several slots can be soloed at the same time.

**Level**

Controls the output level of a program via a fader. The parameter has an influence on all outputs that are used by layers and zones inside the program.

**Pan**

Controls the stereo position of a program. The parameter has an influence on all outputs that are used by layers and zones inside the program. If the slot bus has a surround configuration, this control is not available.

**MIDI Port and Channel**

Determines on which MIDI port and channel the slot receives MIDI messages.

**MIDI Activity Indicator**

Indicates incoming MIDI data by displaying a green bar next to the slot number.

**Polyphony**

Determines how many notes can be triggered simultaneously.

NOTE

If a note triggers several zones at the same time, the number of resulting voices can be much higher.

---

**Output**

Determines the output bus the slot uses to transmit its signal.

NOTE

This setting does not affect any output routing that has been set up for individual layers or zones inside the program.

---

**Level Meter**

The level meter on the right indicates the signal level of the slot's output bus.

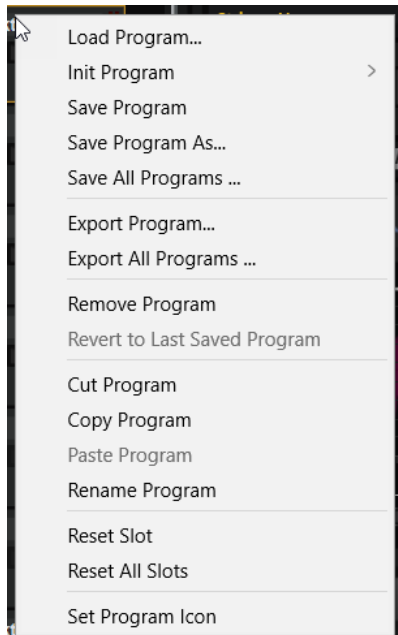
NOTE

If a program contains layers and zones that are routed to individual outputs, these are not reflected in the level meter.

---

## Slot Context Menu

The context menu provides a number of functions for managing programs.

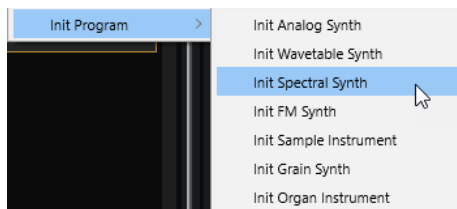


### Load Program

Opens the program loader. Double-click a program to load it into this slot.

### Init Program

Opens a submenu from which you can select one of the Init programs for the available sound sources. Init programs are templates that contain the necessary settings and components for the selected synth engine or instrument sound source. They allow you to get started without first having to configure the program and the HALion window.



### Save Program

Saves the program.

#### NOTE

If you try to overwrite write-protected factory content, a dialog prompts you to save the edited program under a new name.

---

### Save Program As

Allows you to make attribute settings for your program and save it to your user content folder or the specified folder in your system.

### Save All Programs

Allows you to save all programs as VST presets.

### Export Program

Allows you to change the attributes for your program and save it in a new location.

### Export All Programs

Allows you to set up attributes for all programs at the same time and save them in a new location.

#### NOTE

- Existing attribute values are kept, that is, if a program already contains an attribute value for an attribute that you set up for all programs, this value is not overwritten.
  - The preset format of the programs is not modified, that is, if a program contains HALion presets and HALion Sonic presets, for example, these are saved with their respective formats maintained.
- 

### Remove Program

Removes the program from the slot.

### Revert to Last Saved Program

Discards any changes that you made to the program since the last time it was saved.

### Cut Program

Copies the program and removes it from the slot.

### Copy Program

Copies the program.

### Paste Program

Pastes the copied program into the slot. If the slot already contains a program, it is replaced.

### Rename Program

Allows you to rename the program.

### Reset Slot

Resets the slot to the default values.

### Reset All Slots

Resets all slots to the default values.

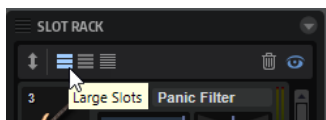
### Set Program Icon

Allows you to specify a custom icon for your program.

#### NOTE

Icons are shown in the program slot section at the top of the window and in the **Slot Rack** if the slot size controls are set to **Large Slots**.

---



#### NOTE

You can also cut, copy, and paste programs from one plug-in instance to another.

---

#### RELATED LINKS

[Adding User Icons to Programs](#) on page 67



## Adding User Icons to Programs

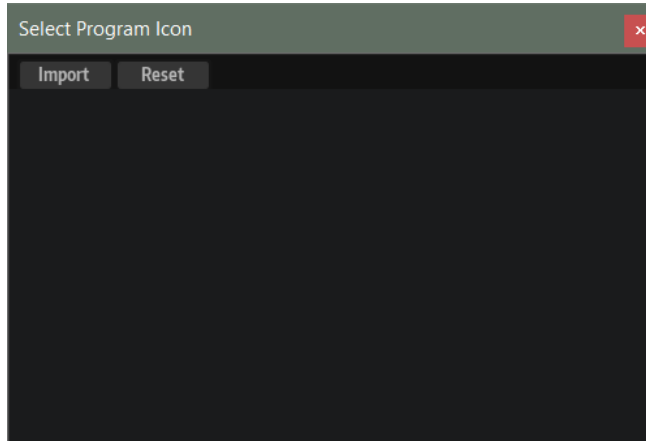
If you do not want to use the generic program icons for your programs, you can assign and use your own icons in HALion.

---

### PROCEDURE

1. Right-click the program name in the **Slot Rack**, and select **Set Program Icon**.

The **Set Program Icon** dialog opens. No icons are available, unless you have previously added them.



2. Click **Import** to search your system for user icons.  
The supported file formats are .jpg, .jpeg, .bmp, and .png.
  3. Select the icon that you want to use, and click **OK**.  
The image is automatically scaled to 50x50 pixels and saved to the **Program Icons** subfolder of your user presets folder. An additional variant with a resolution of 100x100 pixels is also added. This icon is used when working with HiDPI monitors.
  4. The **Set Program Icon** dialog now shows your icon. Click on it to assign it to the selected program.
- 

### RESULT

The icon is displayed in the program slot section at the top of the window and in the **Slot Rack** if the slot size controls are set to **Large Slots**.

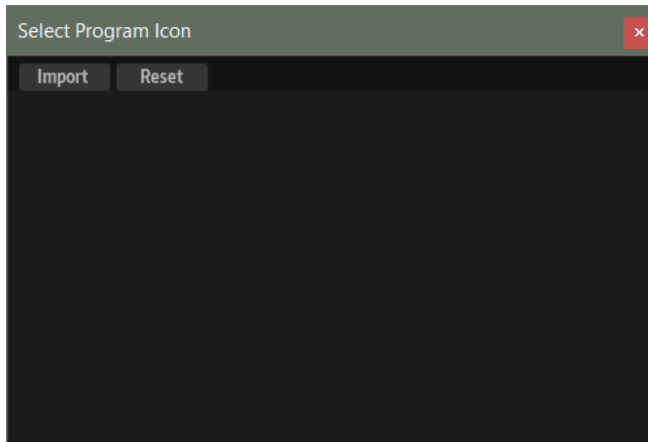
### NOTE

If HALion cannot find the assigned user icon for a program, the default icon is used.

---

## Set Program Icon Dialog

The **Set Program Icon** dialog allows you to import, assign, and remove user icons for your programs.



### Import

Opens a dialog where you can select and import a user icon.

The supported file formats are .jpg, .jpeg, .bmp, and .png.

### Reset

Resets the category-based default icon for the program.

### Icon display

Lists the imported user icons.

### RELATED LINKS

[Adding User Icons to Programs](#) on page 67

## Removing User Icons from Programs

If the **Set Program Icon** dialog contains icons that you do not want to use any more, you can remove them.

---

### PROCEDURE

- To remove a user icon, move the mouse over it, and click the **Delete** button in the upper right corner.

---

### RESULT

This deletes the icon file and its HiDPI variant from the user presets folder.

## Managing and Loading Files

You can use the **MediaBay** and the **Browser** to manage, navigate to, load, and preview different file types.

## MediaBay

The **MediaBay** enables you to access presets, such as multi-programs, programs, and layers.

In the top section of the page, you can specify which sounds to look for. The lower section displays the corresponding results.

- To adjust the size of the two sections, drag the divider at the top of the results list.



### Reset Filter

Resets all filter settings.

### Synchronize Filter Settings with Selected Slot

- If this button is activated, selecting a program from the **Slot Rack** automatically sets the **MediaBay** search filters to the state they were in when the program was loaded. This makes it easier to replace a program with a similar program.  
If you select an empty slot, all search filters are reset.  
If no program, layer, or multi was loaded because you loaded the program via the **Browser** or via drag and drop from the File Explorer/macOS Finder, the search settings do not change when you select this slot.
- If this button is deactivated, the filter settings are global for all slots.

### Import FXP/FXB/HSB VST Sound

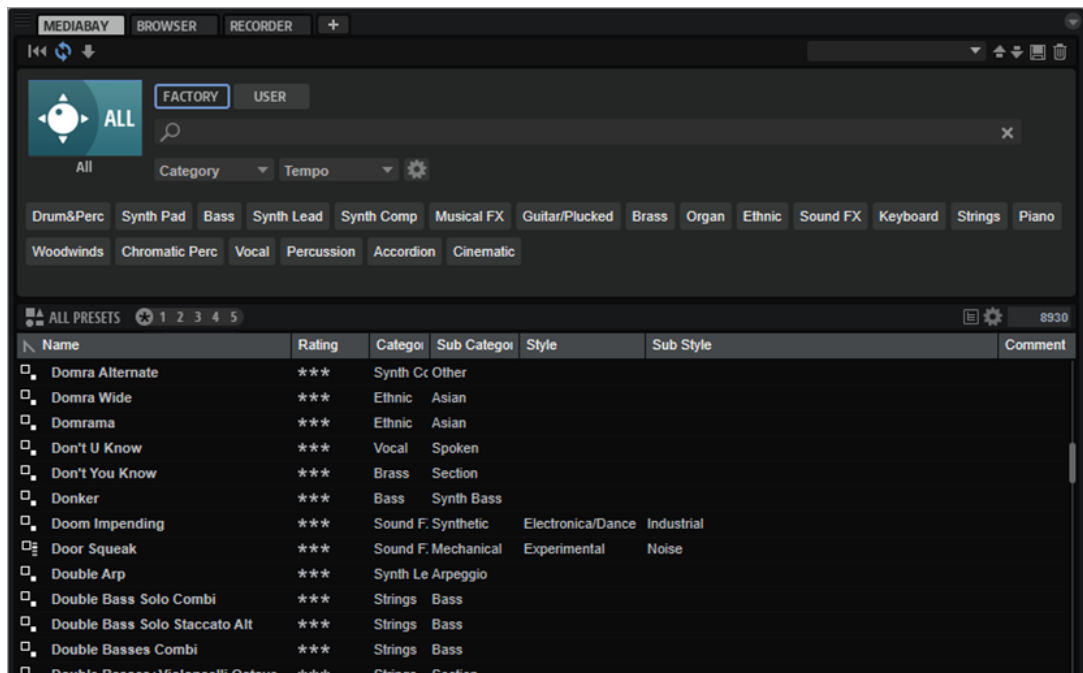
Allows you to register HSB or VST Sound files and import FXP/FXB files. This enables you to load HALion 3 presets from HSB container files, VST Sound files, or FXP/FXB files.

## Presets

You can save, load, and delete the settings of a **MediaBay** search, which includes both the search mask at the top and the results list. This allows you to create search templates for different search scenarios, for example.

Saving the **MediaBay** with active search filters allows you to create different preset collections that can then be recalled very quickly. These collections are dynamic, that is, any new presets added to your system at a later time also appear in the results list when a new search is performed.

## Search Mask and Results List



### Select Library

Click the library icon on the left to open the library selector, where you can specify which library to search for content.

### Factory

Activate this button to search for presets that are part of commercial or free libraries and that are installed on your system as VST Sound libraries. These libraries can be part of HALion or HALion Sonic, for example, or they can be included in expansion libraries.

### User

Activate this button to search for presets that you have created and saved in the **MediaBay**.

### Filter Text

In the text search field, you can enter text that is part of the name or an attribute of a preset that you are looking for. For example, if you enter **Piano**, the results list displays all presets whose name contains "Piano", or presets for which the term "Piano" is used in one of the attributes, such as the **Category** attribute **Piano** or the **Subcategory** attribute **Keyboard | E.Piano**.


### Configure Attribute Menus

Allows you to add attribute menus, where you can specify attributes for your search.

The following attribute menus are available:

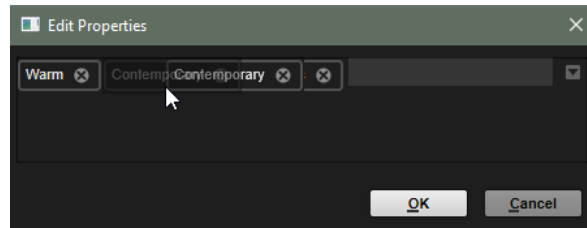
- **Category** opens a tree view that allows you to select a **Category** or a **Subcategory**. **Subcategory** tags are shown together with the corresponding **Category**, in the following way: (Category | Subcategory).
- **Style** opens a tree view which allows to select a **Style** or a **Substyle**. **Substyle** tags are shown together with the corresponding **Style**, in the following way: (Style | Substyle).
- **Properties** opens the **Properties** dialog, where you can add one or multiple **Properties** attributes.

To search for a **Properties** attribute, enter a text string in the text field, such as **warm**, for example. When you start typing, the available properties are shown and can be selected from the list. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order. By adding multiple properties, you can narrow down the results to the ones that match both properties.

Alternatively, click **Show All Attribute Values**  next to the text field to open a list of all **Properties** attributes. You can search for matching attributes by scrolling the list. Press **Return** or click a property to add it.


To add a new **Properties** attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.



- **Moods** opens the **Moods** dialog, where you can add one or more **Moods** attributes.

To search for an attribute, enter a text string in the text field, such as **energetic**, for example. When you start typing, the available properties are shown and can be selected from the list. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order. By adding multiple properties, you can narrow down the results to the ones that match both properties.


Alternatively, click **Show All Attribute Values**  next to the text field to open a list of all attribute values. You can search for matching attribute values by scrolling the list. Press **Return** or click an attribute value to add it.

To add a new **Moods** attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.

- **Articulations** opens the **Articulations** dialog, where you can add one or more **Articulations** attributes.



To search for an attribute, enter a text string in the text field, such as **Decrescendo**, for example. When you start typing, the available articulations are shown and can be selected from the list. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order. By adding multiple articulations, you can narrow down the results to the ones that match both articulations.

Alternatively, click **Show All Attribute Values**  next to the text field to open a list of all **Articulations** attributes. You can search for matching attributes by scrolling the list. Press **Return** or click an attribute to add it.

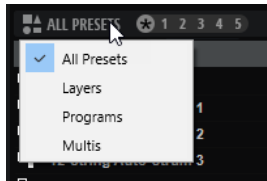
To add a new **Articulations** attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.

- **Author** opens a list with all available authors.
- **Key** opens a list with all available keys.
- **Signature** opens a list with all available signatures.
- **Tempo** opens the **Tempo** dialog, where you can select a **Tempo** and specify a **Range** in which the tempo of the result can deviate from the set tempo. Activate

the **Half-Time**  or **Double-Time**  buttons to include presets that use half or double the tempo.

### Preset Type Menu



On the **Preset Type** menu, you can specify whether to show all presets in the results list, or whether to display only layers, programs, or multi-programs.

### Rating Filter

Allows you to limit the results list according to the rating of the presets. Use the rating slider to define the minimum rating.

### Show Program Structure

Allows you to see the contents of multis, programs, and layers.

### Set up Result Columns

Allows you to select which attribute columns to display in the results list.

#### RELATED LINKS

[Browsing for Files](#) on page 72

[Showing the Program Structure](#) on page 78

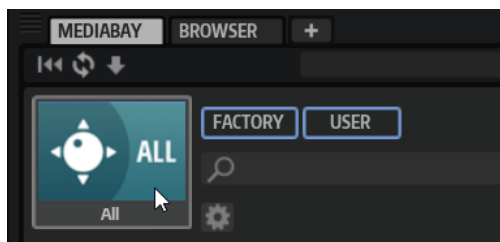
## Browsing for Files

The **MediaBay** allows you to browse for and load files.

---

#### PROCEDURE

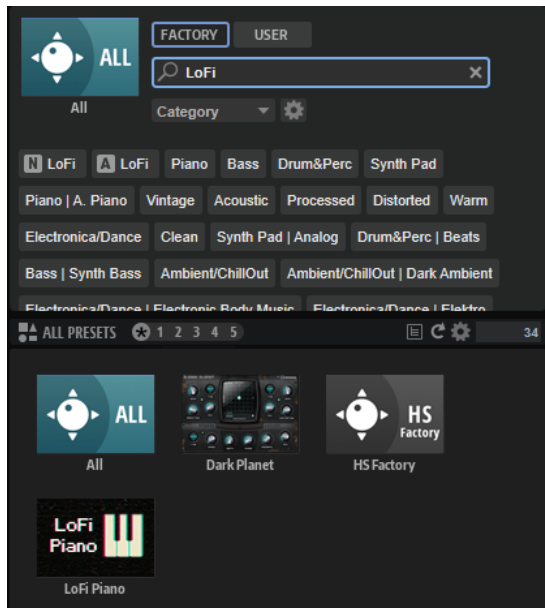
1. Use the **Factory** and **User** buttons at the top of the window to specify whether you want to browse through the factory content or the content that you created yourself.  
You can activate both buttons to browse through the entire content.
2. When you open the **MediaBay** for the first time, the library selector is shown. If a library is selected, for example, because you open the **MediaBay** for a slot that already contains a program, click the library icon to the left of the **Factory** and **User** buttons to open the library selector.



3. In the library selector, specify where you want to search for files: To select a particular library, click it. To browse through the entire content, select **All Libraries**.  
If the library that you want to use is not shown in the visible part of the selector, use the scroll bar, or enter the library name or part of the name in the search field. For example, enter "LoFi" to reduce the list to all libraries whose names contain "LoFi".

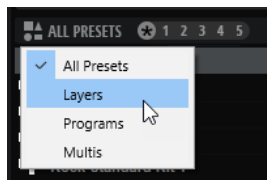
NOTE

If you enter search text, the library selector shows all libraries whose names contain the text, plus all libraries containing files whose names or attributes contain the text.



When you select a library, the text search field is cleared, and the results list shows the files contained in the library.

4. Via the **Preset Type** pop up menu, specify whether you want to search for multi-programs, programs, or layers, or whether you want to browse through the entire content.



5. Above the results list, a list of suggested filter tags is displayed, based on the most frequently used tags. To use a suggested tag as a filter tag, click it. You can activate several filter tags simultaneously.

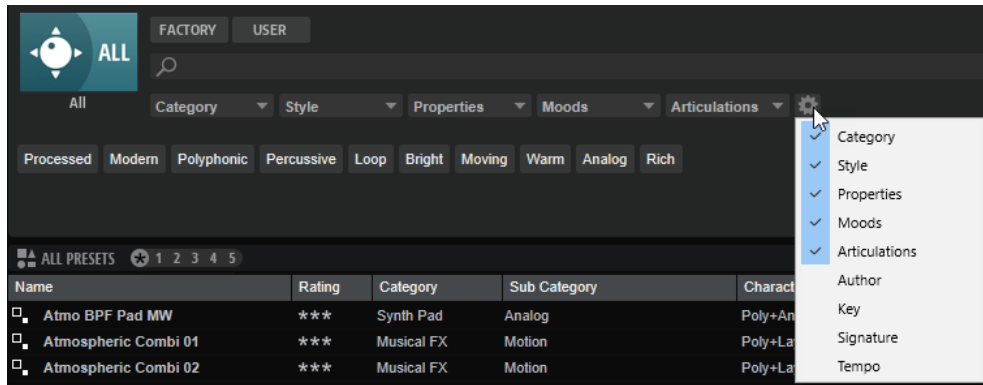
NOTE

Active filter tags have a blue border and are displayed to the left of the suggestions.

The list of suggested filter tags is updated with every active filter tag.

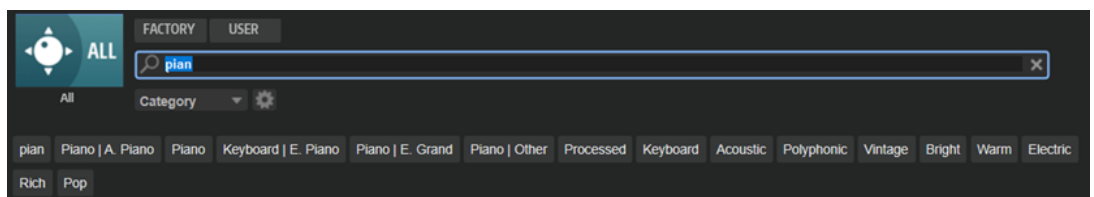
- To remove a filter tag, click its **Remove Filter** button.
  - To remove all tags, click **Remove All Filters** between the filter tags and the suggestions.
6. Optional: Configure the **MediaBay** to provide multiple attribute menus to search for specific types of presets. To add or remove a menu, click the **Configure Attribute Menus** button, and select/deselect the corresponding attribute.

This allows you to perform a search for a specific instrument or for loop-based presets. For example, when looking for instruments, the **Category**, **Articulations**, and **Properties** attribute menus are particularly useful, whereas when looking for loop-based presets, we recommend to search for **Style**, **Tempo**, and **Signature**.

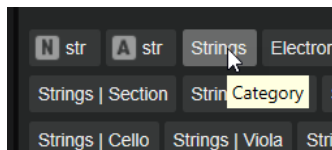


- To search for files that contain a specific text, either in their name or in any of the attributes, enter this text in the text field.

While you type, the list of suggested filter tags is updated. This allows you to see in how many and in which attributes your search text is used.



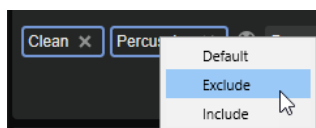
The **Name** **N** and **All Attributes** **A** tags are the first suggestions. To show which attribute another suggested filter tag belongs to, hover the mouse pointer over it to view its tooltip.



**TIP**

Combining tags from different attributes means that both filter criteria need to be matched to create a result. If you add multiple tags for the same attribute, the result only needs to match one of them.

- Optional: You can set the search parameters so that they include or exclude presets with specific tags. To do so, define the **Mode** for the filter tag by right-clicking it, and selecting an option from the menu.



- Default** is the standard behavior. This is indicated by a blue frame.
- Include** can list presets, even if the filter tags prevent this. For example, if you specify **Category = Piano**, **Property = Warm** and **Name = Warm Piano (Mode = Include)**, the results list shows presets whose **Category** and **Property** attributes match, in addition to any presets whose names contain "Warm Piano". **Include** mode is indicated by a green frame around the filter tag.
- Exclude** can exclude presets from the results list, even if their attributes match your settings. For example, if you specify **Category = Piano** and **Property = Warm (Mode = Exclude)**, only piano presets for which the **Warm** tag is not set are listed. **Exclude** mode is indicated by a red frame.



9. In the results list, double-click a file to load it in the selected slot.
  10. Play a note on your keyboard, or use the internal keyboard to listen to the selected file.  
If the file is not what you are looking for, try further files in the results list, and listen to them until you find a file that you like.
- 

RELATED LINKS

[MediaBay](#) on page 69

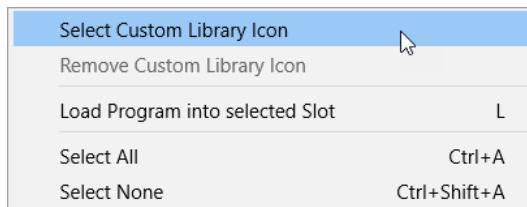
## Using User Icons for Content Libraries

By default, the **MediaBay** library selector displays user libraries with a generic library icon, but you can also set up your own icons for your libraries.

---

PROCEDURE

1. Right-click the icon for your custom library, and select **Select Custom Library Icon**.



2. Navigate to the file that you want to use, and select it.  
The supported file formats are .jpg, .jpeg, .bmp, and .png.
- 

RESULT

The new icon is shown in the library selector.

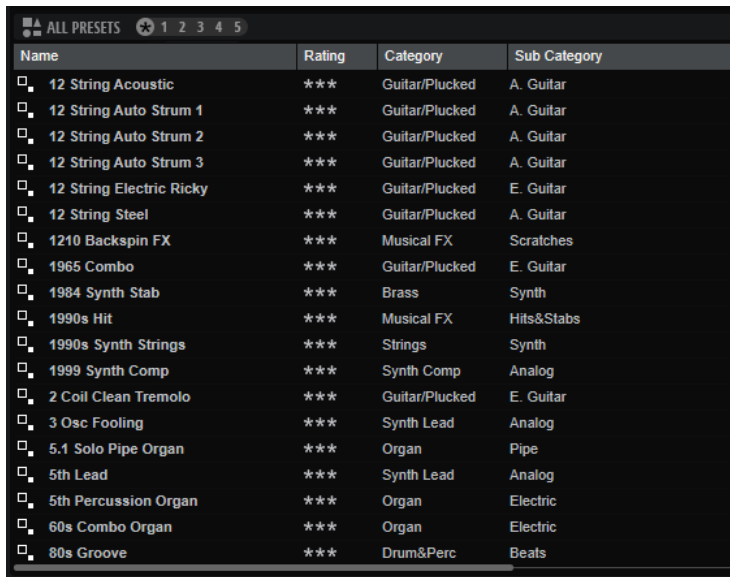
NOTE

The standard size for library icons is 60x90 pixels. Images with a different height or width are resized.

---

## Results List

The results list shows all files that have been found based on your filter settings.



Name	Rating	Category	Sub Category
12 String Acoustic	***	Guitar/Plucked	A. Guitar
12 String Auto Strum 1	***	Guitar/Plucked	A. Guitar
12 String Auto Strum 2	***	Guitar/Plucked	A. Guitar
12 String Auto Strum 3	***	Guitar/Plucked	A. Guitar
12 String Electric Ricky	***	Guitar/Plucked	E. Guitar
12 String Steel	***	Guitar/Plucked	A. Guitar
1210 Backspin FX	***	Musical FX	Scratches
1965 Combo	***	Guitar/Plucked	E. Guitar
1984 Synth Stab	***	Brass	Synth
1990s Hit	***	Musical FX	Hits&Stabs
1990s Synth Strings	***	Strings	Synth
1999 Synth Comp	***	Synth Comp	Analog
2 Coil Clean Tremolo	***	Guitar/Plucked	E. Guitar
3 Osc Fooling	***	Synth Lead	Analog
5.1 Solo Pipe Organ	***	Organ	Pipe
5th Lead	***	Synth Lead	Analog
5th Percussion Organ	***	Organ	Electric
60s Combo Organ	***	Organ	Electric
80s Groove	***	Drum&Perc	Beats

### RELATED LINKS

[Showing the Program Structure on page 78](#)

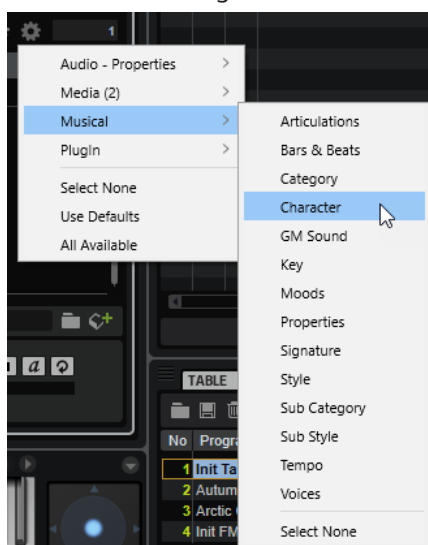
[Configuring the Results List](#)

## Configuring the Results List

You can specify which file attributes to display in the results list and set up the column order so that these attributes are visible without scrolling. This allows you to quickly find files with particular attributes.

### CHOICES

- To define the attributes to be shown in the results list, click **Set up Result Columns** in the upper right corner of the results list, and activate the corresponding entries. New attributes are added at the right of the list.



- **Select None** deselects all attributes.
- **Use Defaults** resets the results list to show the default attributes.

- **All Available** adds columns for all available attributes.
  - To reorder the columns in the results list, drag the column headers to another position.
  - To change the sorting of the list entries, click the column header. The triangle in the column header shows the sorting direction.
- 

## Results List Context Menu

The context menu of the results list offers additional options for managing the selected presets. Different options are available for factory presets and for user presets.

### NOTE

Factory content is write-protected and cannot be deleted or renamed.

---

## Factory Presets

### Load Program into selected Slot/Load Multi-Program

Loads the highlighted preset.

### Select All

Selects all presets in the results list.

### Select None

Cancels any selection in the results list.

## User Presets

### Copy

Copies the selected presets to the clipboard.

### Rename

Opens a dialog for renaming the preset.

### Delete

Moves the selected presets to the trash of your operating system.

### Show in Explorer/Reveal in Finder

Shows the preset in the file browser of your operating system.

### Set/Remove Write Protection


Sets/Removes write protection for the selected presets.

## Assigning General MIDI Program Change Numbers to Sounds

Assigning General MIDI program change numbers to sounds allows you to use MIDI program change messages to load the sounds into the slot of the corresponding MIDI channel.

---

### PROCEDURE

1. In the **MediaBay**, click **Set up Result Columns**  on the title bar of the lower section.
2. Select **Musical > GM Sound**.
3. Select the sound to which you want to apply the GM program change number.
4. In the **GM Sound** column for the sound, select the General MIDI program change number that you want to use.

You can assign the same GM Sound program number several times. If a program number is used more than once, the **Rating** attribute can be used to decide which program to load.

NOTE

Slot 10 ignores any program change messages and keeps the loaded drum set.

---

## Loading Programs into Slots

To load a program into one of the slots of the **Slot Rack**, you have the following possibilities:

- Select the slot into which you want to load the program, and double-click the program in the results list.
- Drag a program from the results list to an empty space in the **Slot Rack** to create a new slot. If you drag it to an existing slot, the current program is replaced.
- Right-click the program, and select **Load Program into selected Slot** from the context menu.

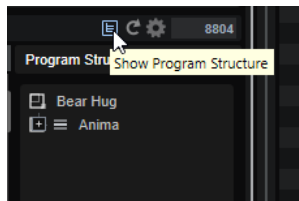
## Showing the Program Structure

You can look inside multis, programs, and layers. This allows you to exclusively load specific components, for example.

---

PROCEDURE

1. Activate **Show Program Structure** on the toolbar of the results list.  
An additional window section is displayed. It shows the contents of the selected multi-program, program, or layer.



2. Navigate through the tree structure, and select the items that you want to use, for example, a program within a multi-program, a single layer of a program, or a single zone.

NOTE

You cannot open protected layers. These are shown with a lock icon.

---

## Importing Presets

You can import program presets from any file location using the File Explorer/macOS Finder.

---

PROCEDURE

1. Select the preset in the File Explorer/macOS Finder.
  2. Drag it to the **MediaBay**.
- 

RESULT

The imported presets are copied to your user folder.

## Editing Attributes

Program, layer, and multi-program presets can be described by using a predefined set of attributes.

Attributes can be edited in the following places in HALion:

- In the **Tagging Editor**.
- In the **MediaBay** results list.
- In the **Save Program As** and **Save Multi-Program As** dialogs.

---

### PROCEDURE

1. To specify or change an attribute value, click in the corresponding field of the **Value** column.

- For most attributes, such as **Author**, a pop-up menu listing the available options opens when you click in the **Value** column.

You can also double-click the field and enter a new author manually.

- Some values, such as **Articulations**, **Properties**, and **Moods**, open a dialog where you can add a number of different attribute values from a list.

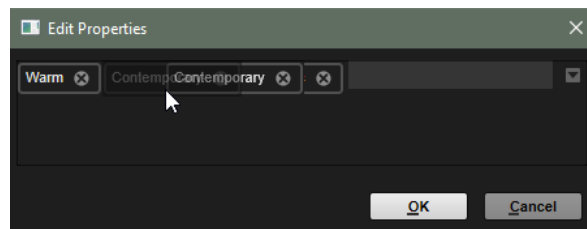
You can use the text field at the top to narrow down the list. For example, type “b” to filter the list to show all attribute values starting with “b”. The list is updated as you type. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order.

Alternatively, click the selector next to the text field to open a list of all attributes.

You can search for matching attributes by scrolling the list. Press **Return** or click an attribute to add it.

To add a new attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.



- For the combined attributes **Category** and **Subcategory** as well as **Style** and **Substyle**, a pop-up panel opens.

If you switch to a **Subcategory** from another **Category**, the **Category** value is automatically updated.

At the bottom of the panel, you can create new **Substyle** or **Subcategory** values.

- For the **Rating** attribute, you can click in the **Value** column and drag left or right to modify the setting.
- For the **Tempo** attribute, you can select an available tempo value from the list.

2. Select a value, activate an attribute, or enter text.

Attribute values are written into the corresponding files.

### NOTE

If you change the attributes for write-protected factory content files, these changes are only saved in the **MediaBay** database, not in the file.

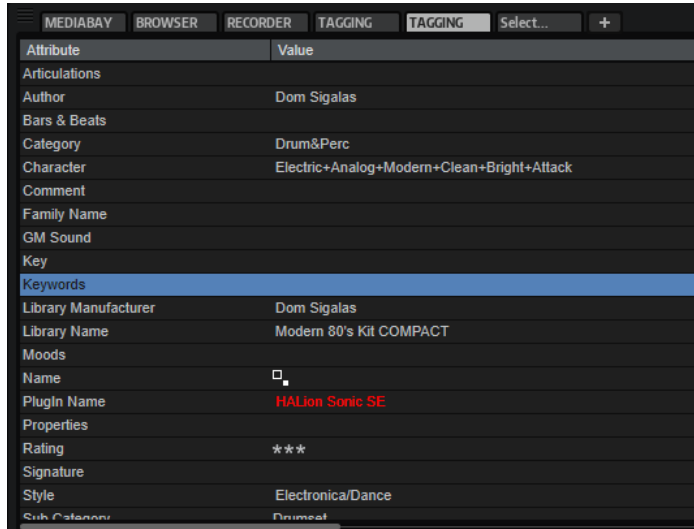
---

RELATED LINKS

[Tagging Editor](#) on page 80

## Tagging Editor

The **Tagging Editor** allows you to set up or edit the attributes for your programs.



In the **Attribute** column on the left, the available attributes are listed.

On the right, you can see and edit the attribute values. Depending on the type of attribute, different editing options are available:

- For most attributes, such as **Author**, a pop-up menu listing the available options opens when you click in the **Value** column.

You can also double-click the field and enter a new author manually.

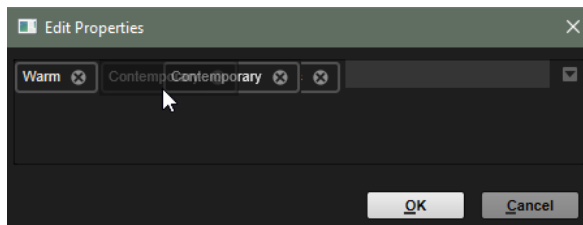
- Some values, such as **Articulations**, **Properties**, and **Moods**, open a dialog where you can add a number of different attribute values from a list.

You can use the text field at the top to narrow down the list. For example, type “b” to filter the list to show all attribute values starting with “b”. The list is updated as you type. If the entered text does not match any of the existing attribute values, all available attribute values are shown in alphabetical order.

Alternatively, click the selector next to the text field to open a list of all attributes. You can search for matching attributes by scrolling the list. Press **Return** or click an attribute to add it.

To add a new attribute, enter the text and press **Return**.

If you specify multiple attributes, you can change their order using drag and drop.



- For the combined attributes **Category** and **Subcategory** as well as **Style** and **Substyle**, a pop-up panel opens.

If you switch to a **Subcategory** from another **Category**, the **Category** value is automatically updated.

At the bottom of the panel, you can create new **Substyle** or **Subcategory** values.

- For the **Rating** attribute, you can click in the **Value** column and drag left or right to modify the setting.
- For the **Tempo** attribute, you can select an available tempo value from the list.

## Deleting User Presets

- To delete a user preset, right-click it, and select **Delete** from the context menu.

### NOTE

Factory presets cannot be deleted.

---

## Loading HALion 3 Programs

You can load HALion 3 presets from HSB container files, VST Sound files, or FXP/FXB files.

To be able to load presets from HALion 3 HSB files or programs that are contained in VST Sound files, the HSB or VST Sound files must be registered in the **MediaBay**.

### NOTE

The factory content is located in a directory that is automatically scanned when HALion is loaded.

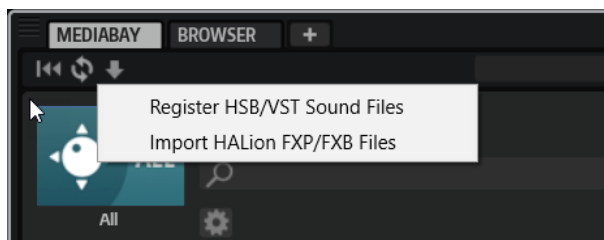
---

## Registering HSB/VST Sound Files

If you added VST Sound files to another folder than the default folder, you must register these files in the **MediaBay**.

### PROCEDURE

1. In the top left of the **MediaBay**, click **Import FXP/FXB/HSB/VST Sound**, and select **Register HSB/VST Sound Files**.



2. Navigate to the files, select them, and click **OK**.  
Alternatively, HSB/VST Sound files can be registered by dragging them from the File Explorer/macOS Finder into the **MediaBay**.
- 

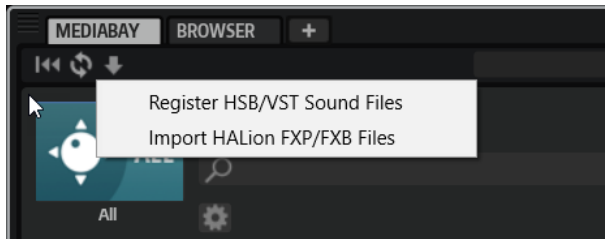
### RESULT

The **MediaBay** has access to the presets.

## Importing FXP/FXB Files

### PROCEDURE

1. In the top left of the **MediaBay**, click **Import FXP/FXB/HSB/VST Sound**, and select **Import HALion FXP/FXB Files**.



2. Navigate to the folder that contains the FXP/FXB file.
  3. Select the file that you want to import, and click **OK**.  
Alternatively, import multiple FXP/FXB files by dragging them from the File Explorer/macOS Finder into the **MediaBay**.
- 

## Loading FXP/FXB Files

To load FXP/FXB files, drag and drop them to the **Slot Rack** or the multi slot.

### NOTE

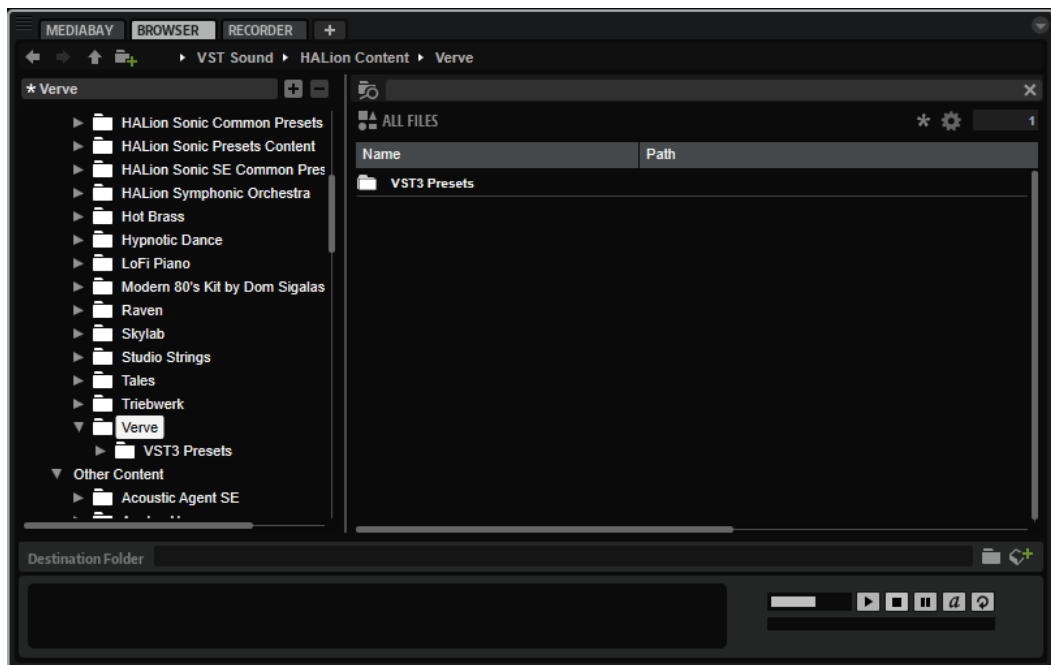
You can also drag and drop FXP/FXB files from the File Explorer/macOS Finder onto the **Slot Rack**.

---

HALion converts the FXP/FXB files into programs or multi-programs.

## Loading Files Using the Browser

In the **Browser**, you can search your system for files.



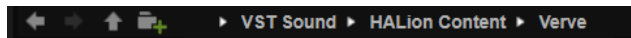
In the **Browser**, you can search and load the following files:

- Samples from the file system or from within loaded programs.  
This also includes program formats from other software and hardware samplers.
- Programs, layers, and multis.

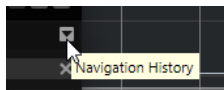


- MIDI files.  
You can load MIDI files onto a MIDI file loader on a macro page via drag and drop.

## Path Section

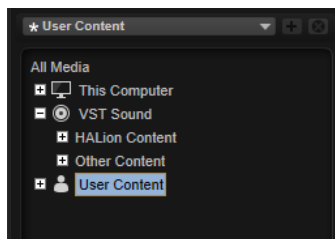


- To step through the recent locations, click the **Previous Browse Location/Next Browse Location** buttons.
- To navigate to the folder one level up in the location tree, click the **Browse Containing Folder** button.
- The path to the current position in the hierarchy is shown on the right. To navigate to one of these folders, click its name.
- To open the history, click the **Navigation History** button on the right.



## Location Tree

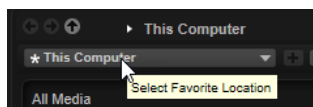
The location tree on the left side of the **Browser** allows you to navigate through the programs, layers, or zones in any folder. You can even access files contained in VST Sound containers, HSB files, and ISO files.



If you select an entry in the tree, the results list shows the corresponding content.

## Locations

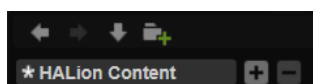
You can save folders or directories in your system as favorite locations for quick access.



The text field above the tree shows the name of the selected folder. If the name is preceded by an asterisk, the folder has not been saved as a location yet.

## Location Controls

At the top of the location tree, you can find the location controls.



### Previous Browse Location/Next Browse Location

These buttons allow you to step through the recent locations.

### **Browse Containing Folder**

Allows you to navigate to the folder one level up in the location tree.

### **Create New Folder**

Creates a new folder on the current hierarchy level of the tree.

### **Favorite Location pop-up menu**

To open the list of favorite locations, click in the text field.

If you have not created any locations yet, this list is empty.

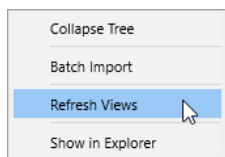
### **Add Selected Media Node as Favorite Location**

Saves the folder that is selected in the location tree as a favorite location.

### **Remove Favorite Location**

Deletes the selected location from the list of favorite locations.

## **Location Tree Context Menu**



### **Collapse Tree**

Collapses the selected element in the tree.

### **Batch Import**

Allows you to import the content of entire folders or ISO image files.

### **Refresh Views**

Updates the tree. This is useful if you added a new disk to your setup or created a new folder on the hard disk.

### **Create New folder**

Creates a new folder in the selected location.

### **Show in Explorer (Win)/Reveal in Finder (Mac)**

Shows the location of the selected file in your system.

## **Results List**

The results list shows the files found in the selected folder. It displays all files that HALion can read, such as VST presets, samples, or third-party sampler programs.

In addition to information like file name and path, the columns in the results list can be configured to show different attributes.

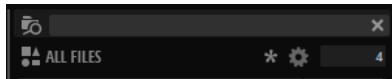
The results list also shows any subfolders of the selected folder, but it does not include the files contained in the subfolders themselves. To see the content of subfolders, you must select the corresponding subfolder.

- To open a folder or location, double-click it in the results list.  
If you double-click a preset, its contents are shown.


You can limit the number of results in the results list using the text search function. This way, you can search for files with specific names, for example. For presets, the search also takes any attributes into account. The value field in the top right corner indicates the number of files that match the search text. To clear the search text, click **Clear Filter Text**.

## Toolbar

You can use the tools on the toolbar above the results list to refine your search criteria.



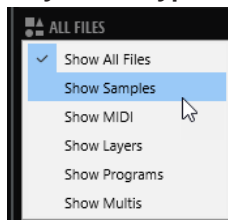
### Search Subfolders

- If this button is activated, the search includes all subfolders of the specified location.  
To automatically perform a new search for files when you switch between folders, activate **Auto Search** .
- If this button is deactivated, only the selected location is searched for files.

### Text Search field

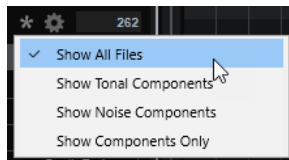
Allows you to enter text that is part of the name or any of the attributes of the file you are looking for.

### Filter by Media Type



Allows you to filter the list to show only samples, MIDI files, layers, programs, or multi-programs.

### Filter by Sound Component



Allows you to filter the list to show only the tonal or the noise components created by the **Decompose** function, to show both the tonal and noise components, or to show all files.

### Set up Result Columns

Allows you to select which attribute columns to display in the results list.

### Results Counter

Displays the number of files that match the filter criteria. To stop an active scanning process, click in the value field.

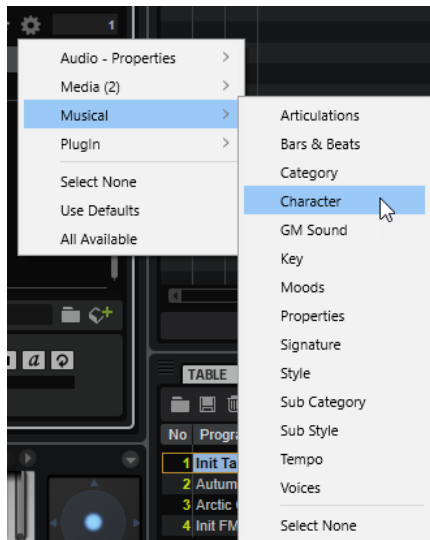
## Configuring the Results List

You can specify which file attributes to display in the results list and set up the column order so that these attributes are visible without scrolling. This allows you to quickly find files with particular attributes.

---

### CHOICES

- To define the attributes to be shown in the results list, click **Set up Result Columns** in the upper right corner of the results list, and activate the corresponding entries. New attributes are added at the right of the list.




- **Select None** deselects all attributes.
  - **Use Defaults** resets the results list to show the default attributes.
  - **All Available** adds columns for all available attributes.
  - To reorder the columns in the results list, drag the column headers to another position.
  - To change the sorting of the list entries, click the column header. The triangle in the column header shows the sorting direction.
- 

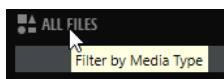
## Searching for Files on Your System

Instead of searching the current results list, you can also use the text search to look for files on your hard disks or in VST Sound containers.

---

### PROCEDURE

1. Select the location that you want to use as the starting point for the search.  
The higher up in the hierarchy the location, the longer the search takes.
2. In the top left corner of the results list, click the **Search Subfolders**  button, and enter the search text in the text field.
3. Optional: On the **Filter by Media Type** menu, specify whether you want to search for samples, MIDI files, layers, programs, multi-programs, or any content.



4. To start the search, press **Return**, or click **Search/Stop Search**.  
The files that match the search criteria are listed in the results list.

### NOTE

The maximum of files that can be displayed in the list is set with the **Max Results** parameter in the **Options Editor**.

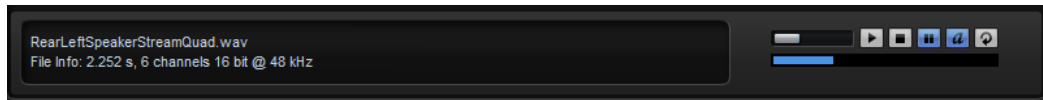
5. Double-click a result to show it in the location tree.
- 

### RELATED LINKS

[Edit Section](#) on page 44

## Prelisten and File Info Sections

The **Prelisten** and **File Info** sections below the results list allow you to play back the focused sample and show information about the file.



### File Info Section

This section shows information on the focused sample or MIDI file.

- Information displayed for samples: length, channels, bit depth, and sample rate. If available, root key, key, and velocity range are also shown.
- For MIDI files, original tempo, signature, and length are shown, as they are saved in the file.

### Prelisten Section

You can listen to the focused sample or MIDI file using the controls in the **Prelisten** section.

#### Level

Adjusts the playback level.

#### Play

Plays back the focused file.

#### Stop

Stops playback. The playback cursor jumps back to the start of the file.

#### Pause

Pauses playback. Click again to resume playback.

#### Prelisten in Place

Activates prelistening of the selected sample.

Click the triangle above the button to select a prelisten option.

- If **Always** is selected, selecting an audio file in the results list triggers the sample, regardless of whether a sequence from the host or the internal pattern player is playing.
- If **Auto** is selected, selecting an audio file from the results list does not trigger the sample if a sequence from the host or the internal **Style Player** or **MIDI Player** is playing. This prevents the prelisten samples from being triggered off the beat. However, the prelisten sample for the pad is replaced, and when the pad is played, the new sample is used.

#### NOTE

As soon as the sample loses the focus in the results list, the **Prelisten** function stops, and the original pad content is played again. This allows you to quickly compare two samples, for example.

---

### Loop Playback


If this button is activated, the focused file is played back repeatedly.

## Destination Folder

When programs are imported, HALion creates a folder for each program. The name of the folder corresponds to the name of the imported program. Inside this folder, a subfolder is created, in which the corresponding samples are saved, if necessary.

The folder specified in the **Destination Folder** field is used to save samples from bank or container files, such as GigaSampler files (.gig). You can enter the path manually or click the button to the right to navigate to a specific directory.

## Adding Files to the MediaBay on Import

To automatically create VST presets for each imported program in the user presets folder, activate **Automatically Add Preset to MediaBay on Import**  to the right of the destination folder field. This way, the imported programs are available in the **MediaBay** and can be used in other projects. Otherwise, imported programs are only available in the current instance of HALion.

## Missing Samples

If you browse the samples of a program and you cannot load them or listen to them, they may have been moved or deleted. In this case, the sample info displays “Sample not found”.

To remedy this, load the program again, and make sure that no samples are missing. Afterwards, be sure to save the program with the restored sample paths.

RELATED LINKS

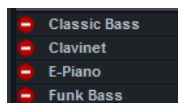
[Finding Missing Samples](#) on page 55

## Loading Files

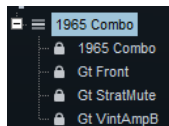
You can load selected programs, layers, zones, or samples by dragging them from the results list to the **Slot Rack**, the **Program Table**, or the **Program Tree**. Programs, layers, and zones can also be dragged from the **Browser**. In all cases, the **Import Folder** dialog opens, where you can specify how to import the contained subfolders and samples.

- To load the file that is focused in the results list into the active slot in the **Slot Rack**, use the key commands **Return** or **L**.

Some file types are not supported. In this case, an icon is displayed to indicate that the file cannot be loaded.



Protected programs and layers are shown with a lock icon to indicate that you cannot extract single zones or samples. However, you can load the programs as a whole.



### NOTE

These icons only appear after selecting the programs.

---

RELATED LINKS

[Importing Samples](#) on page 305

## Loading Files from HALion 3

You can load FXB and FXP files from HALion 3. These files can be located in a directory of the file system or inside an HSB container file. HSB container files must be registered in the **MediaBay** before they can be used. When loading FXB files, the multi-program is replaced.

If FXB or FXP files are referring to HSB container files, the sample paths always work. For samples that are located in the file system, you might have to reestablish the sample paths.

- To register an HSB file, right-click it in the location tree, and select **Register HSB**.
- To import FXP and FXB files, right-click the file in the location tree, and select **Import HALion FXP/FXB-File**.

Single FXP files from within HSB files cannot be imported. In this case, you must register the HSB file.

RELATED LINKS

[Finding Missing Samples](#) on page 55

## Loading Third-Party Sampler Programs

The supported third-party sampler programs appear as nodes in the location tree. You can load entire programs, selected layers, or samples.

Multis and banks in third-party sampler formats can be dropped on the multi-program slot, the **Slot Rack**, or the **Program Table**.

- If you drop a multi or bank on the multi-program slot, the current multi is replaced.
- If you drop a multi or bank on the **Slot Rack**, new slots are created, and the corresponding programs are added to the **Program Table**.  
If the multi or bank contains more programs than slots are available, the remaining programs are added to the **Program Table** only. The current multi is not replaced.
- If you drop a multi or bank on the **Program Table**, the additional programs are added to the **Program Table**. The current multi is not replaced.

### NOTE

If the ISO image or bank has partitions or folders, you can drag only that particular partition or folder to the **Slot Rack** or the **Program Table**. Any contained programs are then loaded. This is different from dragging a folder from the file system to HALion. In that case, the **Import Samples** dialog opens, and only the contained samples are imported and mapped.

---

The following formats can be imported:

- Emagic EXS24
- NI Kontakt 1.x to 4.1 (except for encrypted files, scripted content, and containers)
- Akai\* S1000, S2000, S3000, S5000/6000
- EMU\* 3, 3X, ESI, 4, 4K, E64, E6400, ESynth, Ultra
- Roland S770\*
- Kurzweil (KRZ, K25, K26)
- SoundFonts 2.x

- Giga 1, 2, limited Giga 3 support (except for encrypted content, time stretching, and pitch shifting)
- \* ISO images on HDD only.

## Managing Multi-Programs

Multi-programs, or multis, can load multiple sounds or programs and combine them.

You can use multi-programs to layer several programs or to create split sounds by setting several programs to the same MIDI input channel, for example. However, the most common usage is to create sound sets with different instruments set to individual MIDI channels.

A multi-program contains all plug-in parameters. If you use HALion as a plug-in in a Steinberg DAW, the multi-programs are listed in the **Preset Management** pop-up menu of the host application. You can drag multis and programs from the **MediaBay** to a slot in HALion.

If you use HALion as a plug-in in a different host application, you can use the preset functionality from the host application or the multi management features provided by HALion.

## Loading Multis

- Open the **MediaBay**, and double-click a multi or drag a multi onto the multi slot.
- Click the **Load Multi-Program** button in the multi slot to open the **Load Multi-Program** dialog, select a multi, and click **OK**.

## Renaming Multis

---

### PROCEDURE

- To rename a multi, click in the name field, enter a new name, and press **Return**.
- 

## Removing Multis

- To remove all programs of the current multi, click the **Remove All Programs** button on the toolbar of the **Slot Rack**.

This also resets all slot parameters and removes effects from the slot busses. However, AUX and Master effects are not removed.

### NOTE

Removing the programs from the slots does not remove them from the **Program Table**.

---

## Clearing the Plug-in Instance

- To reset the entire plug-in instance to an empty state, right-click the multi loader, and select **Clear Plug-in Instance** from the context menu.

## Saving Multis

---

### PROCEDURE

1. Click the **Save Multi-Program** button.
2. Enter the name of the multi.
3. Assign any attributes that you want to use, and click **OK**.



If the entered name already exists, a message opens. Click **Make Unique Name** to add a number suffix to the name of the new multi.

---

## Saving a Multi as Default

- To specify a default multi to be loaded with HALion, use the **Save as Default** command on the context menu for the multi loader.

## Creating Subfolders for User-Defined Multis

You can create subfolders inside the user preset folder to organize presets.

- To create a new folder, click the **Create New Folder** icon at the top left of the **Save Multi-Program** dialog.

## Navigating Through the Folder Hierarchy

You can move through the folder hierarchy using the three navigation buttons at the top left of the dialog.

These buttons allow you to navigate to the previous or next browse location, or browse the folder one level up in the location tree.

## Editing Attributes

You can edit the attribute values that are assigned to the preset.

---

### PROCEDURE

1. Open the **Save Multi-Program** dialog, and navigate to the **New Preset Tags** section.
  2. To edit an attribute, click on a value field, and enter the new name or value.
  3. Click **OK** to save the preset.
- 

## Exporting Multis as VST 3 Presets with Files

You can export multi-programs with their required files, for example, to transfer a complete multi to another computer.

---

### PROCEDURE

1. Click the **Export Multi-Program as VST 3 Preset with Files** button next to the multi slot.
  2. Specify a folder and a file name, set up the attributes for the multi, and click **OK**.
- 

### RESULT

The multi is written to the specified location. Folders for the included files, such as samples and macro page content files, are created.

### NOTE

Programs that use samples from VST Sound containers cannot be exported.

---

## Working with General MIDI Files

HALion can play back files in the General MIDI (GM) format.

### PREREQUISITE

Load a GM multi from the **MediaBay**. This way, the first 16 slots are prepared with send effects for chorus and reverb.

---

### PROCEDURE

1. Open the **Options Editor**, navigate to the **MIDI Controller** section, and activate **Receive Program Changes** and **Receive RPNs 0/1/2**.
2. Load the GM file that you want to use.

---

### RESULT

HALion loads the necessary programs and adjusts the chorus and reverb levels.

# Mapping Zones

You can manually edit the sample mapping via the **Mapping Editor**. The mapping functions are based on information like key range, root key, and velocity range.

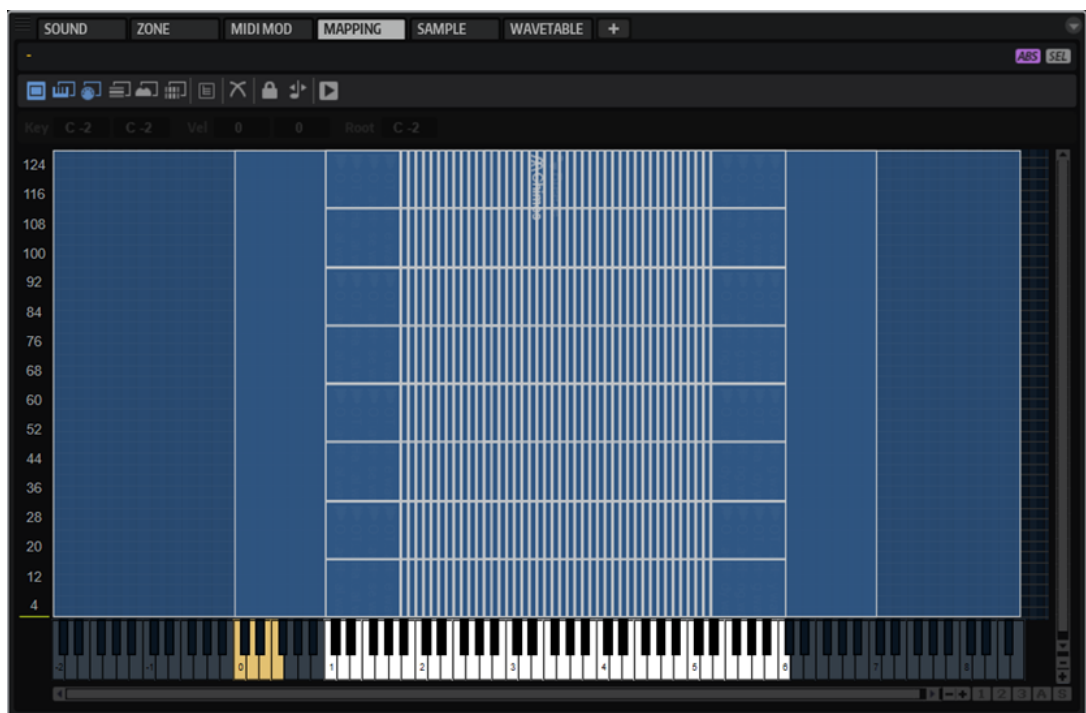
## Mapping Editor

The **Mapping Editor** allows you to view and edit the distribution of the zones within a program.

All zones are mapped to the key range on the horizontal axis and the velocity range on the vertical axis. In the upper area, you have access to mapping ranges and sample parameters for the selected zone. If several zones are selected, the parameters of the focused zone are displayed.

### NOTE

Layers and zones that are hidden in the **Program Tree** are not displayed in the **Mapping Editor**.



Zones are displayed as boxes. Overlapping zones are semi transparent, so that overlapping areas can easily be recognized. Selected zones have a red border, and the focused zone has an orange border. To set the focus on a zone, click on it, or select it from the **Focused Zone** pop-up menu above the toolbar.

When you play notes on your MIDI keyboard, these notes are highlighted on the **Mapping Editor** keyboard. The velocity of the played note is shown on the velocity scale on the left.


To test the sample mapping, choose one of the following options:





- **Ctrl/Cmd**-click a key on the keyboard, and keep the mouse button pressed. HALion plays this key and all following keys at the same velocity, for as long as you press the mouse button.
- Hold down **Ctrl/Cmd - Alt/Opt**, and click a key to play this key and the following keys ten times each, at increasing velocities from 1 to 127.

## Toolbar




### MIDI Mapping Selection Options

You can select zones using the **Mapping Editor** keyboard or an external MIDI keyboard. The mapping selection buttons are available if the **Enable MIDI Mapping Selection Options**  button is activated.

- Activate **Select Zones with the Mapping Editor Keyboard**  to select zones by clicking on the **Mapping Editor** keyboard.
- Activate **Select Zones via MIDI**  to select zones by playing on an external MIDI keyboard.
- If **Select Zones depending on Velocity**  is activated, only zones that match the incoming velocity are selected.
- If **Select Zones using a MIDI Controller to set the Velocity**  is activated, the velocity of the keyboard is replaced by the controller values that are sent by the selected controller.

Right-click the icon to select another controller, or use the **Learn** function.

- If **Select all Zones between the last two played Notes**  is activated, any zones that are located between the last 2 triggered zones are selected.




To extend the selection, play and hold a note. Any additional notes that you play add the corresponding zones to the selection.

If you play a chord, any zones between the lowest and the highest key are selected.

### Scroll Position follows Tree Selection

If the **Scroll Position follows Tree Selection**  button is activated and you select a zone in the **Program Tree**, the **Mapping Editor** automatically scrolls the view to keep the selection in the center. This works on both the keyboard and the velocity axes.

### Crossfade

- If this is set to **Crossfade: Manual** , you can set up and edit each crossfade manually.
- If this is set to **Crossfade: Auto** , the crossfade range is automatically adjusted if you move overlapping zones.
- If this is set to **Crossfade: Symmetric** , you can create symmetric crossfades for zones that have an identical key range and an adjacent velocity range.

### Move Lock



Allows you to lock zones, to prevent you from accidentally moving or resizing them.

### Move Root Key with Zones



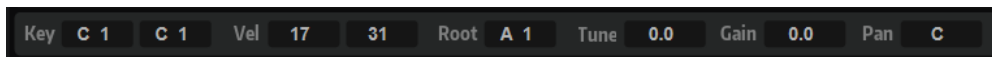
If this button is activated, the root key is automatically adapted when you move a sample zone. This way, you can make sure that moved samples play back at the correct pitch.

### Trigger Zones



If this button is activated, you can trigger zones in the **Mapping Editor**.

## Zone Range Section



Below the toolbar, you can make settings for the zone range. The **Tune** and **Gain** parameters are only available for sample zones.

### Key Range

With the **Low Key** and **High Key** value fields, you can set the key range for the selected zone.

### Velocity Range

With the **Low Velocity** and **High Velocity** value fields, you can set the velocity range for the selected zone.

### Root Key

The root key determines the original pitch of a zone, that is, the key on which the zone is played without being transposed.

### Tune

Sets the tune offset of the zone.

This value can be written into the sample file on export and is read on import.

### Gain

Sets the gain offset of the zone.

This value can be written into the sample file on export and is read on import.

### Pan

Allows you to specify a pan offset for the zone.

## Keyboard



The keyboard indicates the keys that can be used to trigger a zone. It can also be used to trigger notes. The vertical position at which you click a key determines the velocity.

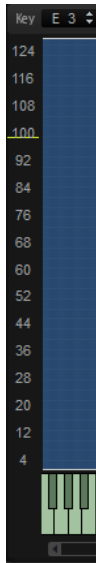
The context menu for a key contains submenus that show information on pitch and velocity, as well as the zones that are mapped to a key.

### NOTE

Keys to which no zones are assigned are grayed out.

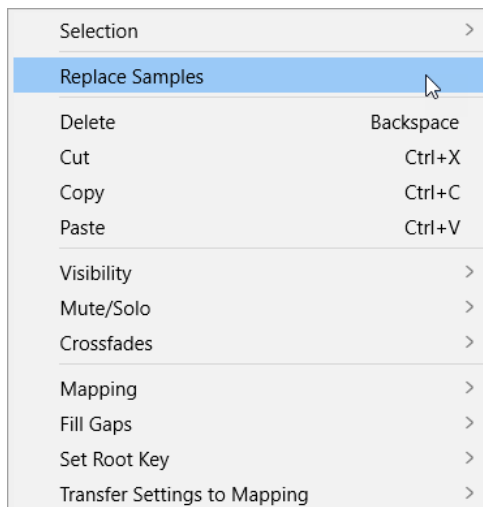
---

## Velocity Scale



The velocity scale on the left provides orientation for adjusting the velocity range of a zone. In the background of the scale, a meter indicates the incoming velocity value. After each note, the meter automatically falls back to zero and leaves a marker on the last velocity value.

## Mapping Editor Context Menu



### Selection

Opens a submenu where you can select all zones or invert the current selection.

- To select all zones, select **Select All**.
- To select all zones that were previously not selected and to deselect all zones that were previously selected, select **Invert Selection**.

### Replace Sample

Allows you to exchange one or multiple samples that are used to play back one or multiple zones. Any zone-specific settings like **Pitch**, **Filter**, or **Amplifier** are not modified by this.

### Delete

Deletes the selected zones.

### Cut

Removes the selected zones and saves them to the clipboard.

### Copy

Copies the selected zones to the clipboard.

### Paste

Pastes the zones from the clipboard to the selected program or layer.

### Visibility

The **Visibility** submenu allows you to control the visibility of zones inside the **Mapping Editor**.

- **Hide Selected** hides the selected zones.
- **Hide Non-Selected** hides all zones that are not selected.
- **Show Selected** shows all selected zones.
- **Hide All** hides all zones.
- **Show All** shows all zones.
- If **Auto Visibility** is activated, the selected zones and any of their direct siblings that are part of the same layer are automatically shown. Other zones are hidden.

### Mute/Solo

- **Mute All Zones** mutes all zones.
- **Solo All Zones** solos all zones.
- **Mute Selected Zones** mutes the selected zones.
- **Solo Selected Zones** solos the selected zones.
- **Make All Zones Audible** resets all mute and solo states for all zones.
- **Solo Follows Selection** automatically solos the zones that you select.

### Crossfades

Zones can partially or entirely overlap. You can create fades in the horizontal (key) and the vertical (velocity) direction. This allows you to successively add particular sound components over the key or the velocity range.

- On the submenu, select whether you want to create crossfades on the keyboard axis or the velocity axis, or both.

### Mapping

Allows you to set up the mapping for the selected sample.

### Fill Gaps

- **Pitch Only** fills any gaps between the selected zones on the keyboard axis.
- **Velocity Only** fills any gaps between the selected zones on the velocity axis.
- **Pitch and Velocity** first fills the gaps on the keyboard axis before filling the remaining gaps on the velocity axis.
- **Velocity and Pitch** first fills the gaps on the velocity axis before filling the remaining gaps on the keyboard axis.

### Set Root Key

Allows you to adjust the root keys of the selected zones without changing their key or velocity ranges.

- **Center of Zone** sets the root key to the center of the zone. If the zone has no center because it has an even number of keys, the root key is set to the key in the center that is closest to the previous root key.
- **High Key of Zone** sets the root key to the **High Key** of the zone.
- **Low Key of Zone** sets the root key to the **Low Key** of the zone.
- **Key Text in Sample Name** sets the root key to the key that is extracted from the sample file name. The function searches for the name of the key in text form.
- **Key Number in Sample Name** sets the root key to the MIDI note number that is extracted from the sample file name. The function searches for a number.
- **Root Key in Sample File** sets the root key to the key that is stored in the header chunk of the sample file.

### Transfer Settings to Mapping

Zones often have varying **Fine Tune** and **Level** settings, while sharing various other settings. To avoid varying **Fine Tune** and **Level** settings, transfer these settings to the **Tune** and **Gain** parameter in the **Mapping Editor**.

- **All** transfers the **Fine** and **Level** settings at the same time.
- **Fine Tune** and **Level** allow you to transfer the parameters separately.

Afterwards, the zone settings are reset to their default values.

## Mapping Options

### Root Key Only

Each sample is mapped to its root key only.

### Root Key Fill Centered

The samples are mapped to their root key. The zones expand to the left and right from the root key to fill empty spaces.

### Root Key Fill Up

The samples are mapped to their root key. The zones expand to the right to fill empty spaces.

### Root Key Fill Down

The samples are mapped to their root key. The zones expand to the left to fill empty spaces.

### Layered on Root Key

The zones are layered on the root key, equally spaced from the lowest to the highest velocity.

### Layered on Key Range

Zones that have exactly the same key range are layered equally spaced from the lowest to the highest velocity.

### Chromatic from Last Key

Starting with the highlighted key of the **Mapping Editor** keyboard, the zones are mapped chromatically to the white and black keys in ascending order. The root keys are set to the corresponding key.

### White Keys from Last Key

Starting with the highlighted key of the **Mapping Editor** keyboard, the zones are mapped to the white keys in ascending order. The root keys are set to the corresponding key.



### **Black Keys from Last Key**

Starting with the highlighted key of the **Mapping Editor** keyboard, the zones are mapped to the black keys in ascending order. The root keys are set to the corresponding key.

### **Layered on Last Key**

On the highlighted key of the **Mapping Editor** keyboard, the zones are layered equally spaced from lowest to highest velocity. The root keys are set to the highlighted key.

### **Stacked on Last Key**

At the highlighted key of the **Mapping Editor** keyboard, the zones are stacked on top of each other. The root keys are set to the highlighted key.

### **Key Text in Sample Name**

The zones are mapped to the key that is extracted from the sample file name. The function searches for the name of the key in text form, for example, C#3. The mapping and root key are set to that key.

### **Key Number in Sample Name**

The zones are mapped to the MIDI note number that is extracted from the sample file name. The function searches for a number. The mapping and the root key are set to that key.

### **Velocity in Layer Name**

The zones are mapped to the velocity range that is extracted from the layer name.

### **Velocity in Sample Name**

The zones are mapped to the velocity range that is extracted from the sample file name.

### **Velocity in Sample Folder**

The zones are mapped to the velocity range that is extracted from the name of the sample folder.

### **Ranges in Sample File**

The zones are mapped to the key and velocity ranges that are stored in the sample file header.

#### **NOTE**

If the header does not contain this information, the samples cannot be mapped.

---

### **Tuning from Sample File**

The zones are mapped according to the tuning settings that are stored in the sample file header.

#### **NOTE**

If the header does not contain this information, the samples cannot be mapped.

---

### **Gain from Sample File**

The zones are mapped according to the gain settings that are stored in the sample file header.

#### **NOTE**

If the header does not contain this information, the samples cannot be mapped.

---

## Sample Zones and their Root Keys

The root key determines the original pitch of a zone, that is, the key on which the zone is played without being transposed. Samples can contain root key information embedded in the sample file. When they are loaded, they are automatically mapped to the corresponding keys.

The sample collections included with HALion contain both multi-sampled instrument programs and single-shot sample programs. The multi-sampled programs contain samples of a specific instrument, usually containing only one sample zone per key on the keyboard. The single-shot programs contain different sample zones that are mapped across the keyboard, without any relationship between key and pitch. For these programs, you might want to move sample zones. After moving the zones, adjust the root key to make the zones play back at the correct pitch.

- To set the root key, enter the value in the **Root Key** value field, or hold down **Alt/Opt**, and click the corresponding key on the keyboard.

## Moving Zones

---

### CHOICES

- To move a zone, select it, click in the middle of it, and drag it to another position.
  - To move several selected zones, click in the middle of one of the zones and drag.
  - To restrict the movement to the horizontal direction, start dragging the zone and press **Ctrl/Cmd**, and to restrict movement to vertical, start dragging and press **Alt/Opt**. When you move sample zones horizontally, they are transposed. Therefore, it might be necessary to adjust the root key.
- 

## Creating Fades and Crossfades

### PREREQUISITE

On the **Crossfades** submenu of the context menu, **Enable Crossfades on Keyboard Axis** or **Enable Crossfade on Velocity Axis**, or both, are activated.

---

### PROCEDURE

- Drag the fade handles to create a fade. For keyboard axis fades, drag left or right, and for velocity axis fades, drag up or down.  
  
By default, the fade curve is exponential, but you can change the curvature by dragging the curve up and down. The maximum curve setting represents an equal power curve. This is useful for velocity crossfades.  
  
If you want to create symmetric crossfades, activate the corresponding button on the toolbar.
- 

### RELATED LINKS

[Crossfade](#) on page 94

## Setting Key Range and Velocity Range

- To set the key range, move the mouse to one of the borders of a zone, and drag to the left or the right, or enter the values manually in the **Low Key** and **High Key** value fields.
- To set the velocity range, move the mouse to one of the borders of a zone, and drag up or down, or enter the values manually in the **Low Velocity** and **High Velocity** value fields.

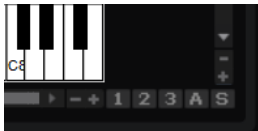
#### NOTE

If several zones are selected, the key range or the velocity range is modified for all zones simultaneously. However, only the values of the focused zone are displayed in the edit fields.

---

## Zooming

The **Mapping Editor** can zoom and scroll in two dimensions: the keyboard and the velocity scale.



#### CHOICES

- To zoom in or out, click the + or - buttons on the scrollbars.
  - To zoom in/out on the locator position, press **G** and **H**.
  - To zoom in on a specific zone, double-click it. To zoom out, double-click again.
  - To zoom in on an area where two or more zones are overlapping, double-click the area. To zoom out, double-click again.
  - To zoom to the selection, activate the **S** button next to the scrollbar.
  - To zoom out completely or return to the last zoom state, click the **A** button next to the scrollbar.
- 

## Using Zoom Snapshots

Zoom snapshots save the zoom factor and the scroll position of the editor. These are restored when you load the snapshot.

To the right of the scrollbar, you can find three numbered buttons that allow you to save and load zoom snapshots.

#### NOTE

If you perform any manual zooming or scrolling, the zoom snapshot is deactivated.

---

#### PROCEDURE

1. To save the current state of the editor as a snapshot, **Shift**-click one of the numbered buttons to the right of the scrollbar.
  2. To load a zoom snapshot, click the corresponding button. The button color changes if a snapshot is active.
- 

## Selecting Zones

- Click a zone to select it.
- **Ctrl/Cmd**-click to select several zones.
- Hold down **Ctrl/Cmd**, and draw a selection rectangle covering the zones that you want to select.
- Press **Ctrl/Cmd - A** to select all zones.

- Click on the velocity scale to select all zones that belong to this velocity.

## Importing Single Samples Using Drag And Drop

---

### PROCEDURE

1. Drag a sample into the mapping section or onto the keyboard, and keep the mouse button pressed.  
An outline representing the sample appears.
  2. Move the mouse pointer up and down.  
The horizontal position of the mouse pointer determines the lowest key of the key range, and the vertical position of the mouse pointer determines the key zone range.
  3. Drop the sample to insert it.
- 

## Importing Multiple Samples Using Drag And Drop

---

### PROCEDURE

1. Select the samples that you want to import.
  2. Drag the samples to the key on the **Mapping Editor** keyboard where you want the first selected sample to be placed.  
If you drag samples from a separate browser window, the selection order determines how the samples are mapped, with the first selected sample being mapped to the first key.
  3. Move the mouse up and down.  
The samples are mapped chromatically. Moving the mouse up or down resizes the key range for each zone.
    - If you move the mouse pointer to the bottom of the **Mapping Editor**, the samples are distributed to different velocities rather than key ranges. The highest velocity is assigned to the sample you select first, the lowest velocity to the one selected last.
    - If you press **Ctrl/Cmd** and move the mouse pointer to the bottom of the **Mapping Editor**, the samples are layered on the keys that you drop them on.
    - If you press **Ctrl/Cmd** and point at a white key, the samples are mapped to the consecutive white keys only, and the key range cannot be extended. Pointing to a black key maps the samples to black keys instead.
  4. Release the mouse button to insert the samples.
-

# Editing Programs and Layers

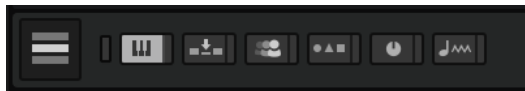
In the **Sound Editor** for programs and layers, you can find the parameters that are set globally for an entire program or layer. For example, you can transpose the pitch, adjust level and pan, and limit the playback to a specific area on the keyboard.

Programs and layers share the same set of parameters.



## Managing Sections

The **Sound Editor** is divided into several sections that contain parameters for different functions or situations.

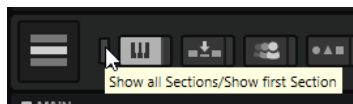


If you activate a section button, the corresponding section is shown. Clicking a section button automatically hides the previously selected section.

To minimize a section, double-click the section header.

If you lock a section by clicking the slim button to the right of each section button, the section button cannot be deactivated, and the corresponding section is always visible in the editor. Clicking another button shows the new section, scrolling the view, if necessary.

Click the **Show all Sections/Show first Section** button to the left of the section buttons to alternate between showing and locking all sections, and showing only the first section.



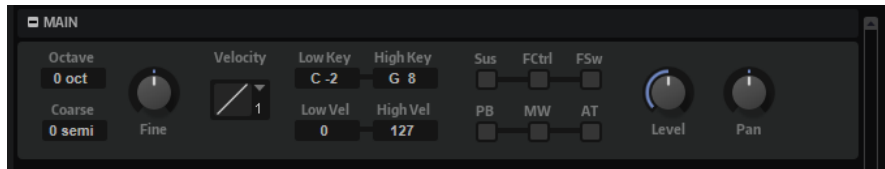
- If only one button is active but not locked, you can click another button to switch exclusively between the two sections.
- Keeping one section locked while showing others dynamically can speed up your work considerably.

For example, you can lock the **Filter** section and then switch between the different modifying sections, such as **Envelope**, **LFO**, **Step Modulator**, and **Modulation Matrix**.

- You can also use these buttons to set up views for different contexts, showing exactly the sections you need for a given workflow, and save them in a screen set.

## Main Section

The **Main**  section of the **Sound Editor** contains basic settings.



### Octave

Transposes the pitch in octave steps.

### Coarse

Transposes the pitch in semitone steps.

### Fine

Detunes the pitch in cents steps (1/100 of a semitone).

### Level Velocity Curve

Defines how incoming MIDI velocity values are re-mapped before they are sent to the program or layer. By default, the incoming and outgoing values are identical. The characteristic of each curve is displayed by a small icon.

### Low Key

Defines the lowest key on which the program or layer is triggered.

### High Key

Defines the highest key on which the program or layer is triggered.

### Low Vel

Defines the lowest velocity on which the program or layer is triggered.

### High Vel

Defines the highest velocity on which the program or layer is triggered.

### Sus, FCtrl, FSw, PB, MW, and AT

The **Filter** options allow you to filter incoming MIDI controllers.


### Level

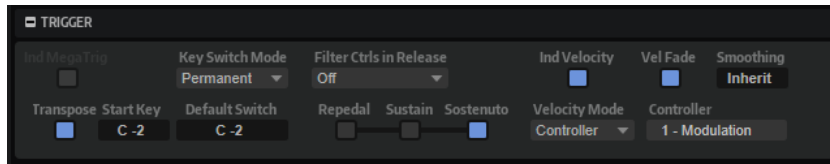
Adjusts the level of the layer. This parameter works as an offset to the zone settings.

### Pan

Defines the position of the layer in the stereo panorama. This parameter works as an offset to the zone settings.

## Trigger Section

The **Trigger**  section of the **Sound Editor** allows you to control the trigger and release behavior.



### Individual MegaTrig Management

Only available for layers. For the key switch assignments across different layers to work individually, activate **Individual MegaTrig Management** for these layers. This can be necessary if you use two layers with different key switches in one program.

### Transpose

Transposes the key switches that you set up for the MegaTrig module.

### Start Key

Defines the key that is used as the lowest key switch.

### Key Switch Mode

Defines how long a key switch stays active.

- If this parameter is set to **Permanent**, the key switch stays active until another key switch is used.
- If this parameter is set to **Temporary**, the key switch is only active for as long as the corresponding key is pressed.

### Default Switch

Specifies the default key switch that is active when you load a program, that means, before you use the first key switch. The default key switch is also used in Temporary mode when no key switch is pressed.

#### NOTE

If you set the **Default Switch** parameter to a note value that is not assigned as a key switch, the lowest key switch is used as the default key switch.

### Filter MIDI Controllers in Release

Filters out MIDI controllers in the release phase. Modulation destinations that are using controllers keep their value after the note-off message.

- If this parameter is set to **Off**, MIDI controllers are processed in the release phase.
- If this parameter is set to **On**, MIDI controllers are filtered out.
- If this parameter is set to **Inherit**, the zones of this layer follow the behavior that you specified for the parent layer.

### Repedaling

On an acoustic piano, you can repedal the sustain after releasing the sustain pedal for as long as the strings vibrate. As a result, the strings continue to play. You can achieve a similar effect with the **Repedaling** option. If you release and press the pedal within the release phase of the amplitude envelope, the envelope jumps to the decay segment, resuming at the current level of the release.

### Sustain

Enables sustain for the program or layer. When you use the sustain pedal, notes keep playing until you release the pedal.

### Sostenuto

Enables sostenuto for the program or layer, so that notes that are held while pressing the sostenuto pedal are sustained. Successive notes are not sustained.

### Individual Velocity Mode

Sample-based instruments often use crossfade techniques to optimize switching between samples with different velocities.

Activate this option to apply the **Velocity Mode** settings to the selected layer and its children.

#### NOTE

Crossfades are set up in the **Mapping Editor**.

---

### Velocity Mode

Switching or crossfading between zones can be controlled via the velocity or via MIDI controllers.

- If **Note-on** is selected, the velocity is used to trigger the zones.
- If **Controller** is selected, a MIDI controller is used to replace the velocity, that is, the controller value is used to select the zones.  
The note-on message triggers the zones selected by the controller. Only zones that belong to the corresponding velocity are played back.
- If **Continuous** is selected, a MIDI controller is used to replace the velocity. Depending on the **Velocity Fade** setting, the controller uses fades when switching between zones. Therefore, all zones belonging to a key are played back.
- If **Ignore Range** is selected, all layers are played in the full range, regardless of the specified ranges in the **Mapping Editor**. No velocity fades are applied in this mode.

### Controller

Determines which controller is used if **Velocity Mode** is set to **Controller** or **Continuous**.

- For the most realistic playback of instruments that use crossfade techniques, activate **Velocity Fade**, and set **Velocity Mode** to **Continuous**.
- To save voices during playback of instruments that use crossfade techniques, deactivate **Velocity Fade**, and set **Velocity Mode** to **Note-on**.

#### NOTE

For a good compromise between performance optimization and realistic playback, try setting **Velocity Mode** to **Controller** and activating **Velocity Fade**.

---

### Enable Velocity Fading

Enables velocity fading and uses the velocity crossfades that are specified in the **Mapping Editor**. If this option is deactivated or if no crossfades are set up, zones switch directly between the different velocities.



### Velocity Fade Smoothing


Sets the time it takes for the controller value to progress from 0 to 127. This determines how smoothly the velocity crossfades are processed when controlled by a continuous MIDI controller.

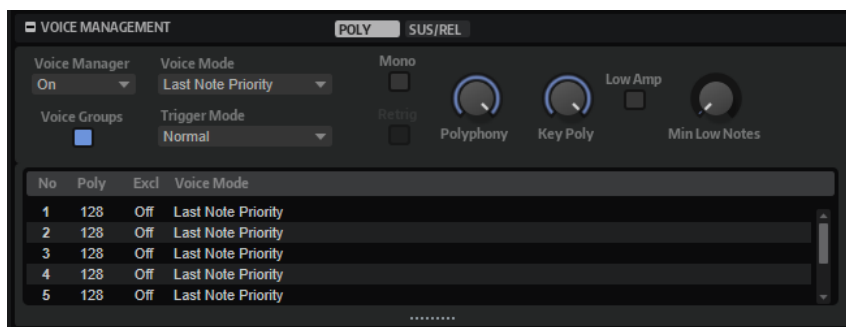
By default, the parameter is set to **Inherit**, which means that it uses the value specified for layers higher up in the program tree hierarchy. If no such layer exists, a value of 100 ms is used. You can set values between 0 and 1000 ms.

#### RELATED LINKS

[MegaTrig](#) on page 654

## Voice Management Section

The **Voice Management**  section allows you to control the maximum number of notes that you can play and to set conditions for note stealing and triggering.



### Voice Manager

Determines which **Voice Management** settings are applied to the selected layer.

- If this parameter is set to **Off**, the layer uses the **Voice Management** settings of the layer one level up in the hierarchy. If no layer with active **Voice Management** settings exists at this level, the settings of the program are used.
- If this parameter is set to **On**, you can make individual **Voice Management** settings for the selected layer.
- If this parameter is set to **Program**, the settings of the program are used, regardless of any **Voice Management** settings made for layers higher up in the hierarchy.

### Voice Mode

Determines which notes are stolen during playback and whether new notes are triggered when the **Polyphony** setting is exceeded.

- **Last Note Priority** – The most recently played notes have playback priority over the notes that were played before them.  
If you exceed the maximum number of notes, the notes that were played first are stolen in chronological order (First in/First Out), and the new notes are triggered.
- **First Note Priority** – Older notes have playback priority over newer notes.  
If you exceed the maximum number of notes while older notes are still being held, no notes are stolen. New notes are only triggered if a free voice is available.
- **Low Note Priority** – Low notes have playback priority over higher notes.  
If you exceed the maximum number of notes by playing a lower note than the ones that are held, the highest note is stolen, and the new note is triggered.

If you exceed the maximum number of notes by playing a higher note than the ones that are held, no note is stolen, and no new note is triggered.

- **High Note Priority** – High notes have playback priority over lower notes.  
If you exceed the maximum number of notes by playing a higher note than the ones that are held, the lowest note is stolen, and the new note is triggered.  
If you exceed the maximum number of notes by playing a lower note than the ones that are held, no note is stolen, and no new note is triggered.
- **Steal Lowest Amplitude** – New notes have playback priority over notes with a low amplitude.  
If you exceed the maximum number of notes, the note with the lowest amplitude is stolen, and the newest note is triggered.
- **Steal Released Notes** – New notes have priority over notes that enter the release phase.  
If you exceed the maximum number of notes, the oldest note that is in its release phase is stolen, and the new note is triggered.  
If no note is playing in release and you exceed the maximum number of notes, the first played notes are stolen in chronological order, and the new notes are triggered.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

#### NOTE

If **Resume** or **Legato** is selected, you might hear an unnatural attack, depending on the sample. To avoid this, activate **Use Start Range** on the **Glide** tab in the **Voice Control** section for the zone.

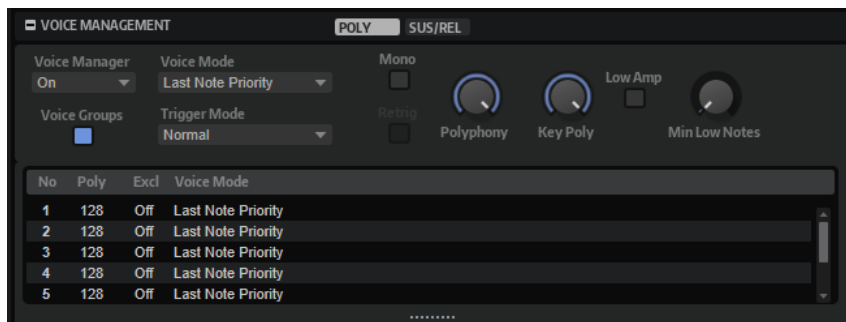
---

## Voice Groups

Allows you to create and use voice groups, that is, groups of zones that can be edited together.

## Poly Tab

The **Poly** tab contains the polyphony settings for programs and layers.



## Mono

Activates monophonic playback. For solo instruments, this usually results in a more naturally sounding performance.

**Mono** can also be used for programs that use dedicated note-off layers. When the played note is released, the note-off layer is triggered.

## Retrigger

This option is only available in **Mono** mode. If **Retrigger** is activated, a note that was stolen by another note is retriggered if you still hold the stolen note when you release the new one.

This way, you can play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

## Polyphony

When you play a note, one or multiple zones can be triggered. Each triggered zone equals a voice. The number of voices that you trigger with each note is displayed in the **Voices** field of the program. Use this parameter to set an upper limit for the number of notes that can be played simultaneously in polyphonic mode.

If a program has a lower **Polyphony** value than its layers, the maximum number of notes that you can play is limited by the **Polyphony** value of the program.

## Key Poly

With this parameter, you can specify an upper limit for the number of notes that can be played for a key. The notes that were played last have priority. For this parameter to take effect, the **Mono** button must be deactivated.

### NOTE

**Key Poly** is limited by the **Polyphony** setting.

## Low Amp

By default, the oldest note is removed first when notes are stolen due to a **Key Poly** limitation. If you want the note with the lowest amplitude to be removed instead, activate **Low Amp**.

### Min Low Notes

Defines the number of low notes that cannot be stolen, regardless of the **Voice Mode** setting.

Make sure that the polyphony of the program is high enough for your specific **Min Low Notes** setting and that it allows you to play additional higher notes.

### Sus/Rel Tab

The **Sus/Rel** tab contains the sustain and release settings for programs and layers.

#### Ind Sustain

Activate this parameter to use individual sustain settings for the selected programs or layers.

#### Sustain Mode

While you hold the sustain pedal, HALion plays back the notes that you play repeatedly until the **Key Polyphony** value is reached. When you release the sustain pedal, the notes of the keys that are no longer held enter the release phase. Depending on the selected **Sustain Mode**, the notes of the keys that are still held either keep playing or also enter the release phase.

- If **Hold Loudest** is selected, the loudest note keeps playing.
- If **Hold Last** is selected, the most recently played note keeps playing.
- If **Hold First** is selected, the first note that you played keeps playing.
- If **Hold All** is selected, all notes keep playing.
- If **Release All** is selected, all notes enter the release phase.

#### Play Release

By default, the release phase of stolen notes is not played back, and the notes fade out in the time specified by the **Fade Out** parameter of the zone. Activate this option to fade out the notes with their normal release phase instead.

## Voice Groups

By assigning zones to a voice group, you can set their polyphony individually. You can manage the polyphony across zones that are not part of the same layer. Furthermore, zones can steal notes from each other, regardless of whether they are in the same layer.

The maximum number of notes that you can play in a voice group is limited by the **Polyphony** setting of the corresponding program or layer.

The parameters of the voice groups are edited using the columns in the table below the **Voice Management** section.

#### No

Shows the number of the voice group.

#### Poly

Allows you to set the polyphony for each voice group.

#### Excl

If voice groups belong to the same exclusive group, they cannot be played back simultaneously. The voice group that was triggered last has priority over the voice groups that were playing before. Any voice groups of the same exclusive group that were playing are cut off. A typical example for assigning voice groups to an exclusive group is a drum set where the closed hi-hat cuts off the open hi-hat.

- To assign a voice group to an exclusive group, select a number from the pop-up menu.

### Voice Mode

Allows you to set the **Voice Mode** parameter separately for each voice group.

#### RELATED LINKS

[Voice Management Section](#) on page 107

## Assigning Zones to Voice Groups

---


### PROCEDURE

1. In the **Program Tree**, select the zones that you want to add to a voice group.
2. Open the **Sound Editor** for the zones.
3. In the **Voice Control** section, on the **Trigger** tab, select a voice group from the **Voice Group** pop-up menu.

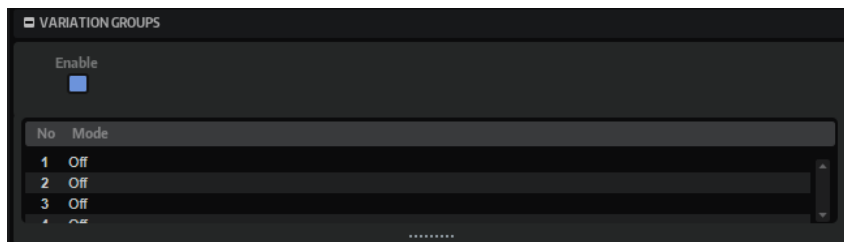
Usually, the voice group numbers relate to the voice groups of the program. If the zone is part of a layer with active voice groups, the numbers relate to the voice groups of the layer instead.

---

## Variation Groups Section

To avoid the so-called machine gun effect that occurs when the same sample is triggered repeatedly, you can create programs that use several samples for the same key and velocity range. These samples can then be triggered alternately as variations. In the **Variation Groups**  section, you can define which samples are triggered as variations by assigning them to variation groups.

If no variation groups are activated, all zones play simultaneously. To avoid this, activate the variation groups for the program or layer containing the zones, and assign the zones to the different variation groups.



### Enable

Activates the variation group feature.

### Mode

Click the **Mode** column to open a pop-up menu with the following options:

- If this parameter is set to **Off**, all variations are triggered simultaneously.
- If this parameter is set to **Round Robin**, all variations are triggered alternately in a fixed order.
- If this parameter is set to **Random**, all variations are triggered randomly. Individual variations can be triggered repeatedly.

- If this parameter is set to **Random Exclusive**, all variations are triggered randomly. No variation is played twice in succession.

## Assigning Zones to Variation Groups

---

### PROCEDURE

1. In the **Program Tree**, select the zones that you want to add to the variation group.
2. Open the **Sound Editor** for the zones.
3. In the **Voice Control** section, select the **Trigger** tab.
4. On the **Variation Group** pop-up menu, select a variation group.

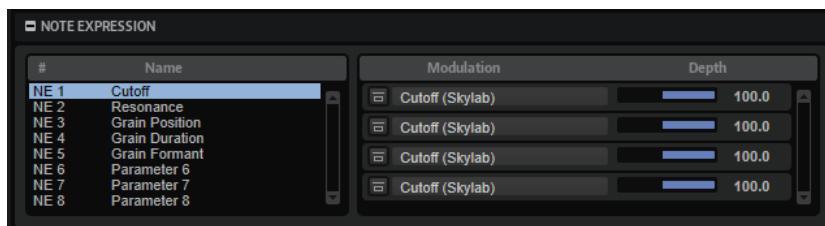
### NOTE

Usually, the variation group numbers relate to the variation groups of the program. If the zone is part of a layer with active variation groups, the numbers relate to the variation groups of the layer instead.

---

## Note Expression Section

This section shows the Note Expression controllers on the left and the assigned modulation destinations on the right. This gives you a quick overview of how the Note Expression controllers are routed in the modulation matrix and of their influence on the sound.



### Name

If you assign a Note Expression controller for the first time, it assumes the name of the modulation destination that it is assigned to. Any further assignments do not change the name. You can manually specify a name by entering it in the **Name** field.

### Bypass Note Expression Controller

To deactivate the effect of the controller, click the **Bypass Note Expression Controller** button. It is linked to the **Bypass** button of the corresponding modulation destination in the modulation matrix.

### Depth

This slider adjusts the intensity of the Note Expression modulation. It is linked to the **Depth** slider of the corresponding modulation destination in the modulation matrix.

### RELATED LINKS

[Note Expression](#) on page 113

## Note Expression

Steinberg's Note Expression technology was developed for creating realistic instrument performances. Note Expression allows you to create automated modulations for each note. HALion supports Note Expression for volume, pan, and tuning.

If you use a Steinberg DAW that supports Note Expression, you can automate the Note Expression parameters for any program in HALion per note.

Furthermore, in programs that give you access to the modulation matrix, you can assign up to eight Note Expression controllers to the available modulation destinations. These are applied in addition to the preassigned pitch, pan, and level modulations.

### NOTE

The Note Expression controllers of a program are shared by all its zones. This means that the controller data affects all zones simultaneously. Depending on how the Note Expression controllers are set up, each zone can react differently.

### NOTE

If you use HALion with host applications that do not support Note Expression, the **Note Expression** editor page and the Note Expression controllers in the modulation matrix are visible, but they do not have any influence on the program.

## Macro Page Editor

The **Macro Page Editor** shows the macro pages contained in your programs. Macro pages are preconfigured to show the most important parameters for the specific programs. For some programs, you edit the parameters on the macro page. In other programs, macro pages give you access to the underlying zone and layer parameters.

If a program comes with a macro page, this page is displayed when you open the **Macro Page Editor**.



- 1 If a program contains multiple layers with macro pages, all macro pages are shown in the **Macro Page Editor**. You can switch between the macro pages with the navigation buttons on the left.
- 2 To mute the layer associated with the macro page, activate the **Mute** button.
- 3 To solo the layer associated with the macro page, activate the **Solo** button.
- 4 If **Automatically adapt HALion to the size of the instrument macro page** is activated, HALion automatically resizes the **Macro Page Editor** to show the selected macro page in its entirety, if necessary.



# Editing Zones

You can edit zones in the **Zone Editor**.


With the **SEL/ALL** button on the toolbar, you can specify whether you want to apply your editing to the selected zone or zones only or to all zones.

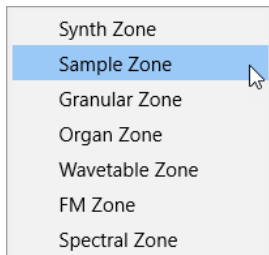
## Adding Zones

You can add zones in the **Program Tree**. Which zone type to add depends on the type of sound that you want to create or work with.

---

### PROCEDURE

1. On the toolbar, click **Create New Zone** .
2. From the pop-up menu, select the zone type that you want to add.



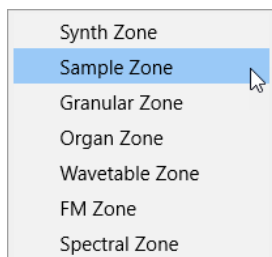
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### RELATED LINKS

[Zone Types](#) on page 115

## Zone Types

On the **Zone Type** pop-up menu, you can choose from different zones, depending on the sound that you want to create.



### Synth Zone

Uses a combination of oscillators, a ring modulator, and a noise generator as sound source. The synth zone oscillators offer much more than classic subtractive synthesis.

### Sample Zone

Uses a sample as sound source. With the AudioWarp features, sample zones allow for pitch shifting and time stretching, and the **Vintage** setting emulates the sound quality

of the first samplers. In the **Sample Editor** for a sample zone, you can slice the sample and create a step modulation for each slice, for example.

### **Granular Zone**

Granular zones use a sophisticated granular synthesis as sound source. This allows you to create complex sounds that can drastically evolve over time from any sample.

### **Organ Zone**

Organ zones produce the sound of classic drawbar organs with up to nine drawbars.

### **Wavetable Zone**

Wavetable zones use wavetable synthesis as sound source. Its high-quality analysis, combined with the wavetable envelope, allows you to reproduce an image of the original sample. Only a few waves are necessary to reproduce the original character of any sample.

### **FM Zone**

FM zones use frequency modulation as sound source. You can combine up to eight oscillators, or operators, using some as tonal carriers and others to modulate the sound of the carrier, or even to modulate another modulator.

### **Spectral Zone**

Spectral zones use the spectral oscillator as sound source. This oscillator analyzes the spectrum of the loaded sample, that is, the progression of the frequencies, amplitudes, and phases from the sample start to the end of the sample. This allows for the re-synthesis of a sample.

#### RELATED LINKS

[Oscillator Section](#) on page 125

[Sample Oscillator Section](#) on page 128

[Grain Oscillator Section](#) on page 136

[Granular Synthesis](#) on page 145

[Wavetable Section](#) on page 146

[FM Oscillator Section](#) on page 154

[Spectral Oscillator Section](#) on page 167

[Creating Zones](#) on page 294

## Changing the type of existing zones

In the **Zone Editor**, you can change the zone type of existing zones by selecting another type from the pop-up menu.

This allows you to create and set up a sample zone, and then switch the zone type to **Granular** or **Wavetable** and use your sample as a basis for further editing in this editor, for example. If you switch between zones, the zone settings are adapted as far as this is possible. A sample oscillator is replaced by a synth oscillator, for example. However, changing the zone type has some limits. When switching from a wavetable to a sample zone, for example, the sample zone will initially be empty. Because there are two oscillators in the wavetable zone that can even refer to multiple samples or work without samples at all, sample data cannot be transferred. The same is true for synth and organ zones that are switched to sample zones.

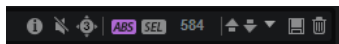
## Adding Samples to Empty Zones

Depending on the zone type, it can be necessary to fill a zone you created with sample material. This applies to sample zones, granular zones, wavetable zones, and spectral zones.

- To add a sample to an empty sample zone, drag it from the File Explorer/macOS Finder or the **Browser** to the sample display in the **Sample Osc** section of the **Zone Editor** or onto the waveform area in the **Sample Editor**. Alternatively, click **Load/Replace Sample** in the header of the **Sample Editor**, and select a sample.
- To add a sample to an empty granular zone, drag it to the sample display in the **Grain Osc** section of the **Zone Editor** or onto the waveform area in the **Sample Editor**. Alternatively, click **Load/Replace Sample** in the header of the **Grain Osc** section, and select a sample.
- To add a sample to an empty wavetable zone, drag it to the waveform area in the **Wavetable Editor**, or use the **Insert From Sample** button on the toolbar of the wavetable overview section.
- To add a sample to an empty spectral zone, drag it onto the sample display on the **Osc** or **Sample** pages in the **Spectral Osc** section or onto the waveform area in the **Sample Editor**. Alternatively, click **Load/Replace Sample** in the header of the **Spectral Osc** section, and select a sample.

## Absolute and Relative Editing

When editing multiple zones, you can either change values absolutely for all the zones (**ABS**) or make relative changes (**REL**), depending on the setting of the corresponding button on the toolbar.



---

### EXAMPLE

- If you use absolute editing and you change a parameter from 50% to 60% for one zone, all other zones are also set to 60%, for example.
- If you use relative editing and you change a parameter from 50% to 60% in one zone, a selected zone that was set to 70% is set to 80%, for example.

---

### NOTE

Relative changes can be made for all parameters that can be adjusted continuously. Changes to parameters that select one of multiple modes or switch between two states are always absolute.

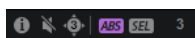
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### RELATED LINKS

[Multi Selection and Parameter Controls](#) on page 22

## Zone Editor Toolbar

The toolbar at the top of the **Zone Editor** contains tools that show/hide more information and set up basic parameters.



### Mute Zone

Mutes the zone.

### HALion 3 Compatibility

This button lights up if you load an FXP file from HALion 3, to indicate that HALion is in compatibility mode. This way, FXP files sound like they did in HALion 3.

If you deactivate the compatibility button, some modulations will sound different.

### ABS/REL

Allows you to switch between absolute and relative editing.

### SEL/ALL

Allows you to select whether the editing is applied to all zones or to the selected zones.

### Selected Zones

Here, you can see how many zones are selected in the **Program Tree**.

### Zone Presets



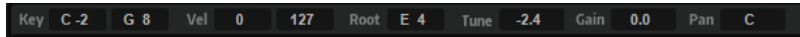
The preset controls allow you to create and manage zone presets.

Zone presets contain the settings that you apply to the different **Zone Editor** sections. They do not contain samples or change the zone type. You can set up a zone preset to make it easier to create several similar zones when importing samples. For example, for drum loops, you would use a preset with a high level setting and no headroom, for multi-sample zones, you would set up a headroom, because several notes are playing at the same time, etc.

## Zone Info Bar

This bar shows information on the zone.

- To show/hide the zone info bar, click **Show/Hide Zone Info Bar**  on the toolbar.



### Key Range

With the **Low Key** and **High Key** value fields, you can set the key range for the selected zone.

### Velocity Range

With the **Low Velocity** and **High Velocity** value fields, you can set the velocity range for the selected zone.

### Root Key

The root key determines the original pitch of a zone, that is, the key on which the zone is played without being transposed.

For grain and sample zones, the following additional options are available:

### Tune

Sets the tune offset of the zone.

This value can be written into the sample file on export and is read on import.

### Gain

Sets the gain offset of the zone.

This value can be written into the sample file on export and is read on import.

### Pan

Allows you to specify a pan offset for the zone.

## Managing Sections

The **Zone Editor** is divided into several sections that contain parameters for different functions or contexts.

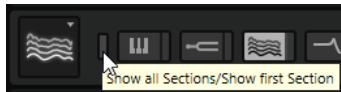


If you activate a section button, the corresponding section is shown. Clicking a section button automatically hides the previously selected section.

To minimize a section, double-click the section header.

If you lock a section by clicking the slim button to the right of each section button, the section button cannot be deactivated, and the corresponding section is always visible in the editor. Clicking another button shows the new section, scrolling the view, if necessary.

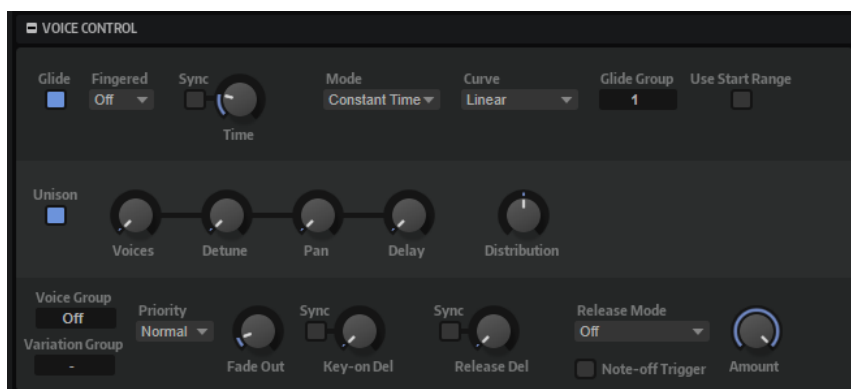
Click the **Show all Sections/Show first Section** button to the left of the section buttons to alternate between showing and locking all sections, and showing only the first section.



- If only one button is active but not locked, you can click another button to switch exclusively between the two sections.
- Keeping one section locked while showing others dynamically can speed up your work considerably.  
For example, you can lock the **Filter** section and then switch between the different modifying sections, such as **Envelope**, **LFO**, **Step Modulator**, and **Modulation Matrix**.
- You can also use these buttons to set up views for different contexts, showing exactly the sections you need for a given workflow, and save them in a screen set.

## Voice Control Section

The **Voice Control Section** contains the same controls for sample, synth, grain, and wavetable zones and a separate set of controls for organ zones.



For sample, synth, grain, and wavetable zones, the following parameters are available:

### Glide Section

**Glide** allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Glide On/Off

Activates/Deactivates **Glide**.

### Fingered

- Set this parameter to **Off** to glide the pitch for every new note that is played.
- Set this parameter to **Any** to glide the pitch only between notes that are played legato.

In this mode, **Glide** is applied to any new note that is played legato, which means that you can use it when playing polyphonically.

- Set this parameter to **On** to glide the pitch only between notes that are played legato and that steal a note that was held.

In this mode, **Glide** is applied if the new legato played note steals a note that is held, which is usually the case when you work in monophonic mode.

If no voices are stolen, no **Glide** is applied.

### Glide Time

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

### Sync

Activate **Sync** to synchronize the glide time to the host tempo. Select a note value from the pop-up menu. To change the selected note value to a triplet, activate the **Triplets** button.



### Mode

- Set this parameter to **Constant Time** to keep the glide time constant and independent from the note interval.
- Set this parameter to **Constant Speed** to change the glide time with the note interval. Larger intervals result in longer glide times.

### Curve

Allows you to select one of three curve types to define the glide behavior.

- With the **Linear** curve, the pitch glides from the start to the end pitch at a continuous speed.
- With the **Exponential** curve, the pitch starts gliding at a higher speed and decelerates towards the end pitch. This behavior is similar to the natural pitch glide produced by a singer.
- With the **Quantized** curve, the pitch glides from the start to the end pitch in semitones.

### Glide Group

If you assign zones to glide groups, you can set the glide effect for each zone individually. This allows you to set up zones with overlapping key ranges and different settings of **Glide Time**, for example.

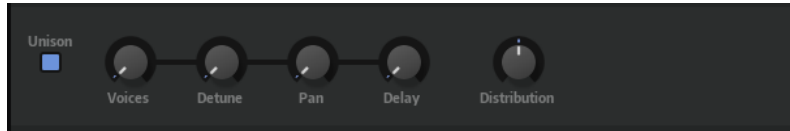
### Use Start Range

If a new note plays in a different zone with a different sample assigned, the new sample is used to glide to the new pitch. Depending on the sample, this can produce an unnatural attack. To avoid this, activate **Use Start Range**. As a result, the sample

does not start from the beginning, but from the position you set with the **Sample Start Range** parameter.

## Unison Section

**Unison** allows you to trigger multiple voices simultaneously with each note that you play.



### Unison On/Off

Activates/Deactivates unison.

### Voices

Determines the number of voices that are triggered simultaneously. The maximum number is eight.

### Detune

Detunes the pitch of each unison voice in cents. This produces a fatter sound.

### Pan

Spreads the unison voices across the stereo panorama. The higher the value, the broader the stereo image.

### Delay

Allows you to introduce a small random delay for each unison voice.

With a value of 0 ms, all unison voices are triggered at the same time. Values from 1 ms to 100 ms add a random delay to each unison voice. The higher the value, the more random the delay. This is especially useful to avoid comb filter effects with two or more slightly detuned samples.

### Distribution

Allows you to specify how unison voices are spread in pitch. Changing the unison voice distribution creates different modulations between the unison voices.

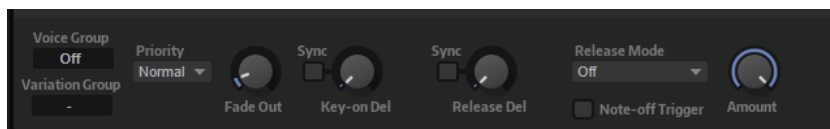
- If this is set to 0, the distribution is linear, that is, all voices have an equal distance in their pitch offset.
- Raising the value stretches the distribution using an exponential curve, so that the first unison voices have a smaller pitch offset than the second and third.
- Decreasing the value stretches the distribution using a negative exponential curve, so that the first unison voices have a larger pitch offset than the second and third voices.

#### NOTE

This parameter is always visible, even if **Unison** is deactivated. The reason for this is that, in addition to the voice distribution of the zone unison, the parameter also affects the voice distribution of the wavetable and synth oscillators with independent multi-oscillator settings.

---

## Trigger Section



Via the **Trigger** section, you can specify the triggering of a zone.

### Voice Group

You can set the polyphony of a zone individually, by assigning it to one of 128 voice groups. The settings for voice groups can be edited in the **Voice Management** section of the program or layer.

### Variation Group

Specifies the **Alternation Mode** for the different variation groups.

### Priority

Each zone that you trigger corresponds to a voice. If the number of played zones exceeds the **Maximum Voices** setting, as specified in the **Options Editor**, zones are cut off and replaced by other zones. This is called “voice stealing”. Use this parameter to specify a priority for this behavior. Zones with higher priority can steal zones with lower priority, but not vice versa. If there are no zones with lower priority, zones of the same priority are stolen. Zones with the priority **Hold** steal only from lower priorities, but not from zones with the same priority.

### Fade Out

Whenever a voice is stolen because a polyphony limit is reached, it is faded out. You can specify this fade out time for each zone, which allows you to adapt it to different signal types. For example, you might want to cut a stolen crash cymbal zone less abruptly than a stolen hi-hat zone.

### Key On Delay

With this parameter, you can delay the playback of the zone by a specified time or a note value.

If **Sync** is deactivated, the delay is specified in milliseconds. If **Sync** is activated, the delay is specified in fractions of beats.

To synchronize the delay time to the host tempo, activate the **Sync** button, and select a note value from the pop-up menu. To change the selected note value to a triplet, activate the **T** button.

### Release Delay

With this parameter, you can delay the release event of the zone by a specified time or a note value.

If **Sync** is deactivated, the delay is specified in milliseconds. If **Sync** is activated, the delay is specified in fractions of beats.

To synchronize the delay time to the host tempo, activate the **Sync** button, and select a note value from the pop-up menu. To change the selected note value to a triplet, activate the **T** button.

### Release Mode and Amount

These parameters determine how loud the release samples are played back. Release samples play back the sound of an instrument when the note ends. For example, this can be the noise of the damper touching down on the piano string, or the reverb tail of an instrument that was recorded in a concert hall.



- **Off** deactivates the **Release Mode**. The level of the note-off sample is controlled by the amplifier section of the zone only.
- If **Note-on Env** is selected, the level of the note-off sample is controlled by the amplitude envelope of the associated note-on sample: The note-off sample is played back with the level that the amplitude envelope has at the moment when the note-off sample is triggered.

#### NOTE

In order to find the associated note-on sample, the mappings of the note-on and note-off samples must overlap. HALion considers the last running note-on sample as the associated sample.

- If **Note-off Env** is selected, the level of the note-off sample is controlled by the amplitude envelope of the note-off sample: The note-off sample is played back with the level that its amplitude envelope has at the moment when the note-off sample is triggered.
- If **Note-on Vel** is selected, the level of the note-off sample is controlled by the incoming MIDI note-on velocity.
- If **Note-off Vel** is selected, the level of the note-off sample is controlled by the incoming MIDI note-off velocity.
- If **Current Amplitude** is selected, the level of the note-off sample is controlled by the current amplitude of the associated note-on sample.
- If **Random** is selected, the level of the release sample is controlled by a random value.

The **Amount** parameter determines to what degree the selected option affects the level of the note-off samples.

#### Note-off Trigger

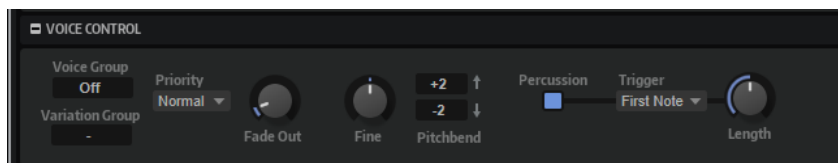
Allows you to trigger zones at note-off events instead of note-on events.

#### RELATED LINKS

[Voice Groups](#) on page 110

[Sample Oscillator Section](#) on page 128

## Voice Control Section for Organ Zones



#### Voice Group

You can set the polyphony of a zone individually, by assigning it to one of 128 voice groups. The settings for voice groups can be edited in the **Voice Management** section of the program or layer.

#### Priority

Each zone that you trigger corresponds to a voice. If the number of played zones exceeds the **Maximum Voices** setting, as specified in the **Options Editor**, zones are cut off and replaced by other zones. This is called “voice stealing”. Use this parameter to specify a priority for this behavior. Zones with higher priority can steal zones with

lower priority, but not vice versa. If there are no zones with lower priority, zones of the same priority are stolen. Zones with the priority **Hold** steal only from lower priorities, but not from zones with the same priority.

#### Variation Group

Specifies the **Alternation Mode** for the different variation groups.

#### Fade Out

Whenever a voice is stolen because a polyphony limit is reached, it is faded out. You can specify this fade out time for each zone, which allows you to adapt it to different signal types. For example, you might want to cut a stolen crash cymbal zone less abruptly than a stolen hi-hat zone.

#### Fine

Allows you to fine-tune the pitch in cent steps.

#### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

#### Percussion

Adds a dedicated percussion envelope to emulate the percussion of vintage organs. The percussion envelope works in addition to the amplifier envelope.

- The **Percussion** button activates/deactivates the percussion envelope.
- The **Length** parameter controls the decay of the percussion.  
For example, set this to 500 ms for short percussion and to 1000 ms for long percussion.
- From the **Trigger** pop-up menu, select **First Note** if you want to use monophonic triggering or **Each Note** if you want to use polyphonic triggering.

#### NOTE

For the typical percussion sound of an organ, use only the drawbars 4' or 2 2/3'.

---

#### RELATED LINKS

[Voice Management Section](#) on page 107

## Pitch Section

In the **Pitch** section for synth, sample, grain, and wavetable zones, you can make settings for tuning and pitch modulation.

#### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

#### Octave

Adjusts the pitch in octave steps.

#### Coarse

Adjusts the pitch in semitone steps.

#### Fine

Allows you to fine-tune the pitch in cent steps.

### Pitch Envelope Amount

Determines how much the pitch is affected by the pitch envelope. For example, if this parameter is set to 12, an envelope node can raise/lower the pitch by one octave.

### Random Pitch

Allows you to randomly offset the pitch with each played note. Higher values cause stronger variations. At a setting of 100%, the random offsets can vary from -6 to +6 semitones.

### Pitch Key Follow

Allows you to adjust the pitch modulation based on the MIDI note number. With this parameter set to a positive value, the higher you play, the more the pitch is raised. With the parameter set to a negative value, the higher you play, the lower the pitch. At a setting of +100%, the pitch follows the played note exactly.

### Center Key

Specifies the MIDI note that is used as the central position for the **Pitch Key Follow** function.

### Bypass Pitch Envelope

This button in the header of the **Pitch** section allows you to bypass the **Pitch** envelope.

#### RELATED LINKS

[Envelope Section](#) on page 185

## Oscillator Section

The **Oscillator** section is available for synth zones.



The **Oscillator** section offers six sound sources: three main oscillators, the sub oscillator, the ring modulation, and the noise generator. To create interesting electronic spectra, you can mix any of these sound sources. The resulting signal is sent to the **Filter** and **Amplifier** sections for further sound shaping.

The three main oscillators (**OSC 1**, **OSC 2**, and **OSC 3**) offer different wave shapes and algorithms.

- To activate an oscillator, click its **On/Off** button.

### OSC 1/2/3 Type

The oscillator type defines the basic sound character of the oscillator. This pop-up menu lists the waveforms **Sine**, **Triangle**, **Saw**, and **Square**, followed by the algorithms **PWM**, **Sync**, **CM** and **XOR**. The combination of waveform and algorithm controls the sound of the oscillator.

The following algorithms are available:

- **PWM** (pulse width modulation) is only supported by the square waveform. The **Waveform** parameter sets the ratio between the high and the low value of the square wave. A setting of 50% produces a pure square wave. With settings below or above 50%, the oscillator produces rectangular waves.
- **Sync** provides different hard-sync oscillators, each of them a combination of a master and slave oscillator. The wave shape of the slave oscillator is reset with each full wave cycle of the master oscillator. This means that a single oscillator can produce a rich sync-sound without using other oscillators. The **Waveform** parameter adjusts the pitch of the slave oscillator, producing the typical sync sound.
- **CM** (cross modulation) provides a combination of two oscillators, where one oscillator is modulating the pitch of another oscillator at the rate of the audio sample. The **Waveform** parameter adjusts the pitch ratio between the two oscillators, resulting in a sound closely resembling frequency modulation.
- **XOR** (exclusive OR) compares two square waveforms with an **XOR** operation. Depending on the outcome of the **XOR** operation, the wave shape of a third oscillator is reset. The **Waveform** parameter adjusts the pitch ratio of the square oscillators, resulting in a sound closely resembling ring modulation of the third oscillator.

#### Osc 1/2/3 Waveform

Modifies the sound of the oscillator algorithm. Its effect depends on the selected oscillator type.

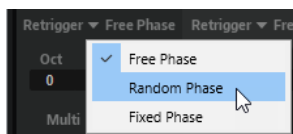
##### NOTE

- Except for **PWM**, all algorithms support the **Sine**, **Triangle**, **Saw**, and **Square** wave shapes. **PWM** only supports the **Square** wave shape.
- The **Waveform** parameter for the three main oscillators can be assigned as the modulation destination in the modulation matrix.

---

#### Retrigger Mode

Allows you to decide whether the oscillator runs freely, with a random phase each time a note is triggered, or with a fixed start phase.



- If **Free Phase** is selected, the behavior of analog synthesizers is emulated. The oscillator is running freely and continuously.
- If **Random Phase** is selected, the start phase is randomly set to a different value each time that you trigger a note. In contrast to **Free Phase**, there is no continuity in the phase of the waveform.
- If **Fixed Phase** is selected, the oscillator runs with a fixed start phase that can be specified by setting it to a value between 0 and 360 degrees.

#### OSC 1/2/3 Octave

Adjusts the pitch in octave steps.

#### OSC 1/2/3 Coarse

Adjusts the pitch in semitone steps.

### OSC 1/2/3 Fine

Adjusts the pitch in cent steps. This allows you to fine-tune the oscillator sound.

### Multi-Oscillator Mode

For the three main oscillators, you can activate **Multi-Oscillator** mode. This allows you to create a richer sound by producing up to eight oscillators simultaneously.

The effect is similar to the **Unison** mode for the zone, but it requires less performance.

- To activate **Multi-Oscillator** mode, activate the **Multi** button.

#### NOTE

If **Multi-Oscillator** mode is active for an oscillator, you can modulate the corresponding parameters in the modulation matrix.

---

### Multi Oscillator Number, Detune, and Pan

- **Number** determines the number of oscillators that play back simultaneously. You can also set fractions of numbers. For example, with a setting of 2.5, you hear two oscillators at full level and a third one at half level.
- **Detune** detunes the oscillators.
- **Pan** narrows or widens the stereo panorama. With a setting of 0%, you create a mono signal, and at 100%, you create a stereo signal.

#### NOTE

The pitch distribution of the oscillators is determined by the **Distribution** control in the **Voice Control** section.

---

### OSC 1/2/3 Level

Adjusts the output level of the oscillator.

#### NOTE

**Waveform**, **Pitch**, and **Level** of oscillators 1, 2, and 3 can be modulated separately in the modulation matrix.

---

### Sub Oscillator

The pitch of the sub oscillator is always one octave lower than the overall pitch. The overall pitch is determined by the **Octave** setting.

#### On/Off

Activates/Deactivates the sub oscillator.

#### Type

Determines the wave shape of the sub oscillator. You can choose **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, or **Pulse Narrow**.

#### Level

Adjusts the output level of the sub oscillator.

### Ring Modulator

Ring modulation generates sums and differences between the frequencies of two signals.

### Ring Modulation Source 1/Ring Modulation Source 2

Determines the sources to be ring modulated. You can select **OSC 1** or **Sub** as **Source 1**, and **OSC 2** or **OSC 3** as **Source 2**.

#### NOTE

Make sure that the corresponding oscillators are activated when you select them. Otherwise, no sound is heard.

### Ring Modulation Level

Adjusts the output level of the ring modulation.

### Noise Generator

The **Noise** parameter is used for non-pitched sounds. In addition to standard white and pink noise, there are also band-pass filtered versions of white and pink noise.

#### Noise Type

The sound color of the noise. You can choose between standard and band-pass filtered (**BPF**) versions of white and pink noise.

#### Noise Level

Adjusts the output level of the noise generator.

#### RELATED LINKS

[Modulation Matrix](#) on page 205

## Sample Oscillator Section

This section is available for sample zones. It encompasses two pages: **Mode** and **Sample**.

### Load/Replace Sample

Allows you to load an initial sample or to replace the current sample.

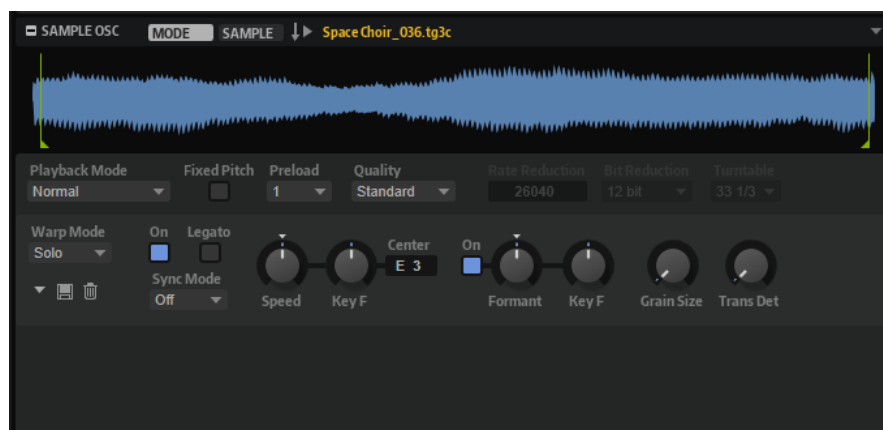
In the **Load** dialog, you can prelisten the samples.

### Trigger Note on Click in Sample Display

Allows you to start playback of the sample by clicking in the waveform display.

### Mode Page

The **Mode** page contains the AudioWarp parameters that allow you to apply time stretching and formant shifting to the audio in your sample zones.



### Playback Mode

- **Normal** – The sample is played back from beginning to end. If loops are defined, they are played back according to their loop settings.
- **Reverse** – The sample is played from end to beginning. If loops are defined, they are played back according to their loop settings.
- **One-Shot** – The sample is played back from beginning to end, regardless of any loop settings.
- **Reverse One-Shot** – The sample is played back from end to beginning, regardless of any loop settings.

In **One-Shot** and **Reverse One-Shot** mode, the zones ignore any MIDI note-off messages. All envelopes and LFOs play until their sustain is reached and then remain at this level for as long as the sample plays back. Any release segments of the envelopes and LFOs are not played. However, if you activate **One-Shot** mode in the **Envelope** section, the release nodes of the envelopes are included in the playback.

### Fixed Pitch

If a sample zone is triggered by a MIDI note other than the one defined by the **Root Key** setting, the sample is normally pitched accordingly. With **Fixed Pitch** activated, the relation between played note and root key is disregarded, and all keys play the sample, just as it was recorded.

#### NOTE

You can still apply the usual pitch modulations in the **Pitch** section and set the sample to follow the keyboard according to the **Pitch Key Follow** setting.

---

### Preload

A sample can either be loaded completely into RAM, or it can be streamed from the hard disk. If samples are streamed, HALion needs to preload a portion of these samples to be able to play a voice without having to search for the sample data first. The size of this preload buffer can be set in the **Options Editor**. The **Preload** setting allows you to adapt this buffer size for individual sample zones by setting a multiplier from 1 to 16. Increasing the buffer size is a good idea if a sample can be transposed in a wide range and HALion needs to read out the sample data faster, for example.

If you set **Preload** to its maximum, the entire sample is preloaded. This is useful for smaller samples.

### Quality

If samples are not played at their original pitch or tempo, HALion calculates the transposed versions in real time using algorithms that require different CPU performance depending on the **Quality** setting.

Changes regarding the **Quality** settings are particularly noticeable for the high frequencies. The higher the setting, the better the suppression of artifacts. For samples with little high-frequency content, you can use the **Standard** option. For programs that use different samples for every key, you can use the **Standard** option to save computing power.

If **Quality** is set to **Vintage**, you can make the following settings:

- **Rate Reduction** allows you to specify a sample frequency, to simulate the lower sample rates of early samplers.
- **Bit Reduction** allows you to apply the bit depth that was used by early samplers.

- **Turntable** emulates the memory-optimized workflow of the past, when turntables were sampled at a speed of 45 RPM to record shorter samples, and then tuned down again to compensate for the change in pitch.

If you set this parameter to **78 RPM**, you can increase the number of vintage artifacts that are generated.

### Warp Mode

From the **Warp Mode** pop-up menu, you can select the mode to be used for the AudioWarp functions.

- **Off** deactivates the **AudioWarp** functions.
- **Solo** offers parameters for time stretching and formant shifting. This mode is suitable for solo instruments and vocals. It is highly efficient and supports polyphonic playback.

When you activate **Solo** mode, HALion performs a pitch analysis of the sample and stores the pitch data, for quick reloading of the samples if they are used in presets, for example. Depending on the size of the samples, the analysis process can take some time.

#### NOTE

If samples are modified, the pitch analysis is performed again, and the data is updated.

- **Music** offers parameters for time stretching. This mode is suitable for complex material like drum loops and samples with mixed music. It uses considerably more CPU time than **Solo** mode. Therefore, it is suitable for monophonic playback. The more a sample is stretched, the higher the CPU load.

**Music** mode can only be used with mono and stereo samples. If you process multi-channel samples, only the left and right channels are stretched. The remaining channels are turned off.

- **Spectral** offers parameters for time stretching and formant shifting. This mode is suitable for any kind of material, from solo instruments to complex material such as drum loops and samples with mixed music. It delivers the best audio quality, but it requires slightly more CPU time than **Music** mode.

### Time Stretching On/Off

If this button is activated, you can play back a sample at a different pitch than the root key, without changing its tempo and length.

In **Music** mode, transposition is limited to the range between -24 and +24 semitones around the root key of the sample. If you play notes outside this limit, the highest or lowest note is used, respectively. The same applies for pitch modulation. Settings outside the -24 to +24 semitones limit lead to clipping in the modulation.

### Legato

You can use this function to turn a vocal sample into a choir, for example. With the **Legato** button activated, you can add more voices while the sample is playing. These voices are inserted at the current playback position. All voices play in sync. If you play legato, the sample continues to play and you can change the chord without restarting the sample.

Sometimes, the added voices can have audible clicks in the attack, for example, if playback starts at some point in the middle of the sample. You can compensate for this by increasing the attack time of the amplifier envelope.



NOTE

**Legato** only works within a single sample zone, not across separate sample zones.

---

### Sync Mode

The **Sync** modes are used to match the playback speed of the sample to the tempo of the host application.

- If **Off** is selected, the playback speed is specified manually, in percent.
- If **Tempo** is selected, the playback speed is calculated using the ratio between the original tempo of the sample and the tempo of the host.
- If **Beats** is selected, the playback speed is calculated using the note length of the beats, the number of beats, and the tempo of the host.

For the **Sync** modes to work properly, the loop of the sample has to be set up correctly. In **Tempo** mode, the original tempo must be set as exactly as possible.

If you load a sample that contains tempo information in the file header, HALion uses this information to set up the parameters **Original Tempo**, **Note Length**, and **Number of Beats**. If a sample does not contain any tempo information, HALion estimates these values.

NOTE

You can always modify the parameter values manually.

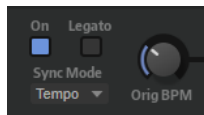
---

### Speed

Adjusts the playback speed of the sample. You can speed up the tempo by up to 800 % of the original.

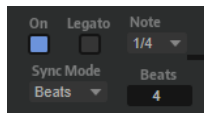
In **Music** mode, the lower limit of the playback speed adjustment is 12.5 %. Values below this limit have no effect.

### Original BPM



If **Sync Mode** is set to **Tempo**, you can enter the original tempo of the sample in beats per minute. The playback speed of the sample is adjusted to match the tempo of the host application.

### Note Length and Number of Beats



If **Sync Mode** is set to **Beats**, HALion calculates the tempo of the sample, based on the note length and the number of beats that you enter.

For example, if the sample is a drum loop with four quarter notes, set **Note** to 1/4 and **Beats** to 4. The playback speed of the sample is adjusted to match the tempo of the host.

### AudioWarp Key Follow

Adjusts the time stretch modulation using MIDI note numbers.

With this parameter set to a positive value, the higher the notes you play, the more the playback speed of the sample increases. Set to a negative value, the higher the notes you play, the slower the playback speed.

#### **Key Follow Center Key**

Specifies the MIDI note that is used as the center position for **AudioWarp Key Follow**.

#### **Formant Shift On/Off**

Activates/Deactivates the formant settings. Formant shifting allows you to avoid so-called “Mickey Mouse” effects when pitch shifting a sample. This is especially useful with samples of human voices or acoustic instruments.

##### **NOTE**

The **Formant Shift** options are only available for the **Warp Mode** settings **Solo** and **Spectral**.

---

#### **Formant Shift**

Specifies the amount of formant shifting.

#### **Formant Shift Key Follow**

Determines how much the formants follow the pitch. Use positive values to minimize the “Mickey Mouse” effect caused by pitch shifting.

#### **Minimum Grain Size**

If you use complex material, a larger grain size can improve the sound. The higher this setting, the less accurate the pitch detection, which helps to avoid misinterpretations of pitch.

In addition, you can use this parameter to experiment and create interesting effects.

##### **NOTE**

This parameter is only available if **Warp Mode** is set to **Solo**.

---

#### **Transient Detection**

Sets a threshold for the transient detection. The higher the value, the more transients are detected. Transients can sound more defined if you adjust this parameter.

##### **NOTE**

This parameter is only available if **Warp Mode** is set to **Solo**.

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#### **Spectral Resolution**

If you use complex material with dense frequencies, a higher spectral resolution can improve the sound.

##### **NOTE**

This parameter is only available if **Warp Mode** is set to **Spectral**.

---

#### **Transient Sensitivity**

**Transient Sensitivity** sets a sensitivity for the transient detection. The higher the value, the more transients are detected. The detected transients are unaffected by time stretching, which results in a more defined sound.

Different types of samples need different amounts of transient sensitivity. For example, drums need a high **Transient Sensitivity** setting, but vocals also sound clean with a

lower **Transient Sensitivity** setting. Reduce the **Transient Sensitivity** if you are faced with artifacts, such as double transients in drum loops, or if you hear clicks or pops in your samples.

At 0%, no transients are detected.

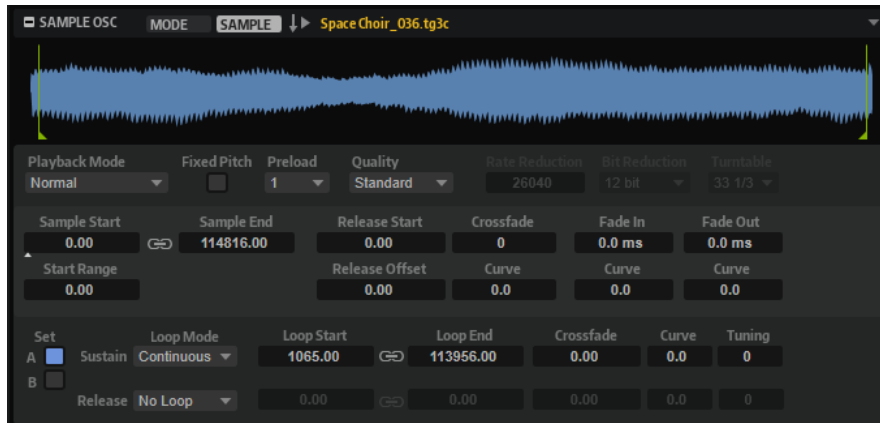
**NOTE**

This parameter is only available if **Warp Mode** is set to **Spectral**.

---

## Sample Page

The **Sample** page contains the playback and loop parameters.



### Waveform display

Shows the waveform of the loaded sample. For the parameters **Start Range**, **Release Start**, **Loop Start** and **Loop End**, markers are shown in the display. You can drag the markers in the display to change their position.

### Playback Mode

- **Normal** – The sample is played back from beginning to end. If loops are defined, they are played back according to their loop settings.
- **Reverse** – The sample is played from end to beginning. If loops are defined, they are played back according to their loop settings.
- **One-Shot** – The sample is played back from beginning to end, regardless of any loop settings.
- **Reverse One-Shot** – The sample is played back from end to beginning, regardless of any loop settings.

In **One-Shot** and **Reverse One-Shot** mode, the zones ignore any MIDI note-off messages. All envelopes and LFOs play until their sustain is reached and then remain at this level for as long as the sample plays back. Any release segments of the envelopes and LFOs are not played. However, if you activate **One-Shot** mode in the **Envelope** section, the release nodes of the envelopes are included in the playback.

### Fixed Pitch

If a sample zone is triggered by a MIDI note other than the one defined by the **Root Key** setting, the sample is normally pitched accordingly. With **Fixed Pitch** activated, the relation between played note and root key is disregarded, and all keys play the sample, just as it was recorded.

NOTE

You can still apply the usual pitch modulations in the **Pitch** section and set the sample to follow the keyboard according to the **Pitch Key Follow** setting.

### Preload

A sample can either be loaded completely into RAM, or it can be streamed from the hard disk. If samples are streamed, HALion needs to preload a portion of these samples to be able to play a voice without having to search for the sample data first. The size of this preload buffer can be set in the **Options Editor**. The **Preload** setting allows you to adapt this buffer size for individual sample zones by setting a multiplier from 1 to 16. Increasing the buffer size is a good idea if a sample can be transposed in a wide range and HALion needs to read out the sample data faster, for example.

If you set **Preload** to its maximum, the entire sample is preloaded. This is useful for smaller samples.

### Quality

If samples are not played at their original pitch or tempo, HALion calculates the transposed versions in real time using algorithms that require different CPU performance depending on the **Quality** setting.

Changes regarding the **Quality** settings are particularly noticeable for the high frequencies. The higher the setting, the better the suppression of artifacts. For samples with little high-frequency content, you can use the **Standard** option. For programs that use different samples for every key, you can use the **Standard** option to save computing power.

If **Quality** is set to **Vintage**, you can make the following settings:

- **Rate Reduction** allows you to specify a sample frequency, to simulate the lower sample rates of early samplers.
- **Bit Reduction** allows you to apply the bit depth that was used by early samplers.
- **Turntable** emulates the memory-optimized workflow of the past, when turntables were sampled at a speed of 45 RPM to record shorter samples, and then tuned down again to compensate for the change in pitch.

If you set this parameter to **78 RPM**, you can increase the number of vintage artifacts that are generated.

### Sample Start

The start marker of the sample.

### Start Range

Determines the range for sample start offset modulation. If **Sample Start** is selected as a modulation destination in the modulation matrix, the **Start Range** parameter controls the sample portion that is affected by the start offset modulation. If this parameter is set to zero, no sample start modulation is performed.

For example, if **Note-on Velocity** is used to modulate the **Sample Start** parameter, a high key velocity starts playback later in the sample, and the range of this modulation is determined by the **Start Range** parameter.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

### Link Loop Start and End

Links the loop start and end positions. If you edit one of the values, the other one is automatically modified.

### Sample End

The end marker of the sample.

### Release Start

Determines the position to which the cursor jumps when you release a key.

For example, if you are playing back a sample in a loop but you want it to play its original release phase, set the **Release Start** parameter to this position.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

### Release Offset

Allows you to fine-tune the release start for each sample.

This allows you to offset the release start for several zones at the same time without losing the original release settings, for example.

### Crossfade/Fade In/Fade Out

Allow you to set the curve and the length of the fade in, the fade out, and the crossfade.

### Loop Sets A and B

Allow you to set up two different sets of loops for the same sample. This is useful to compare different versions of the same loop, for example.

### Loop Mode

Allows you to select a mode for the sustain loop and the release loop.

- If this is set to **No Loop**, the sample is played without a loop.
- If this is set to **Continuous**, the loop is played continuously until the end of the amplitude envelope.
- If this is set to **Alternate**, the loop runs back and forth, even if you release the key.
- If this is set to **Once**, the loop is repeated once.
- If this is set to **Until Release** (sustain loop only), the loop is repeated until you release the key on the keyboard.
- If this is set to **Alternate Until Release** (sustain loop only), the loop runs back and forth for as long as the key is held, and then continues to the end of the sample.

#### NOTE

If **Loop Mode** is set to **Alternate** or **Alternate Until Release**, the loop crossfade is applied to the loop start and the loop end. All other modes on the **Loop Mode** pop-up menu apply the loop crossfade to the loop end only.

---

### Loop Start

Defines the loop start for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Loop End

Defines the loop end for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Tuning

Sets the tuning of the loop. This is useful to adjust the frequency of the loop.

RELATED LINKS

[Editing Samples in the Sample Editor](#) on page 221

## Modulating AudioWarp Parameters in the Modulation Matrix

You can modulate the playback speed and formant shift of the sample in the modulation matrix.

PREREQUISITE

Make sure that the AudioWarp parameters are activated for the samples that you want to edit.

---

PROCEDURE

1. In the modulation matrix, select a destination.  
On the **Sample** submenu of the modulation destinations, the options **Speed Factor** and **Formant Shift** are available.
2. Assign a modulation source and set up the modulation depth.

NOTE

The destination **Formant Shift** can only be used in **Solo** mode.

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RELATED LINKS

[Modulation Matrix](#) on page 205

## Grain Oscillator Section

The **Grain Oscillator** is available for granular zones.

It contains two tabs: **Grain** and **Sample**.

The section header contains the following options:

**Load/Replace Sample**

Allows you to load an initial sample or to replace the current sample.

In the **Load** dialog, you can prelisten the samples.

**Trigger Note on Click in Sample Display**

Allows you to start playback of the sample by clicking in the waveform display.

## Grain Tab

The **Grain** tab of the grain oscillator contains the parameters for the granular synthesis.



### Sample Display

The sample display provides an overview of the sample and shows a playback locator for each grain stream. It shows the resulting effects of the grain oscillator parameters and helps you find the sample portions that you want to use as grain sources.

The sample start and end markers of the sample are indicated by orange lines. They determine the range that can be used to create grains. If the sample has a defined sustain loop, the grains use the sample range between sample start and loop end.

#### NOTE

Release loop settings and release markers are not taken into account. The sustain and the release loop are shown as green and red shades in the sample display. The release marker is shown as a blue line. However, these are only indicators. You can edit the corresponding parameters on the **Sample** tab.

### Speed and Direction

The **Speed** and **Direction** parameters determine how the playback position moves through the sample when you play a note.

#### Speed

Determines how fast the playback position progresses through the sample. If this is set to 0 %, the playback position stays fixed. At a setting of 100 %, the playback position moves through the sample at its original speed. At the maximum setting, the playback speed is eight times faster than the original speed.

#### Direction

Allows you to set the playback speed in smaller increments. Furthermore, this determines the playback direction. If you enter negative values, the playback position moves backwards through the sample.

### Position Settings

#### Position

You can set the playback position of the grains manually. For example, at a setting of 50%, the playback position is in the middle of the sample. The playback position is updated with every new grain.

### Random Position

Selects a random playback position within a specific range around the current position. At a setting of 100%, the playback position jumps to a random position between the start and the end of the sample. The random playback position is calculated separately for each channel of the sample, at the start of a new grain. This can be used to widen the panorama of the sound.

### Position Spread

If **Number of Grains** is set to a value higher than 1, this parameter spreads the playback positions of the grains, making each grain play back a different portion of the sample.

### Channel Offset

Offsets the playback position for each channel of the sample. Positive values modify the playback position of the right channel, and negative values modify the playback position of the left channel. In either case, the other channel is not affected. This can be used to widen the panorama of the sound. If the sample is mono, the oscillator creates a copy of the channel. This allows you to create a stereo sound from a mono sample, for example.

## Pitch Settings

In granular synthesis, either the pitch of the original sample or the grain oscillator define the pitch of a sound.

- To use the pitch of the original sample, raise the **Duration** value until you can clearly hear the pitch of the sample.  
If you change the pitch, the spectrum of the sound changes. You can use the standard pitch settings of the zone, for example, **Glide**, **Pitchbend**, **Octave**, etc.
- To define the pitch using the grain oscillator, set the **Duration** parameter to very low values, preferably 1 or 2.  
To set the pitch of the grain oscillator, adjust the **Duration**, **Center Key**, and **Key Follow** parameters. If you want the pitch of the grain oscillator to follow the pitch of the zone, activate **Follow Zone Pitch**.

### Pitch Interval

Allows you to specify an interval between -12 and +12 semitones. The grains are played randomly at their original pitch, or are transposed according to the pitch interval. This parameter is suitable for longer grain durations.

### Pitch Random

Sets the random pitch range in semitones and cents. At a setting of +12, the random pitch values lie between -12 and +12 semitones. The random pitch is calculated separately for each channel of the sample, at the start of a new grain. This parameter can be used to enrich the sound.

### Pitch Spread

This parameter is available if **Number of Grains** is set to a value higher than 1. It detunes the pitch of the grains in semitones and cents. The first grain keeps its pitch, and the other grains are detuned evenly to values within the specified range. The last grain is detuned to the maximum value.

#### NOTE

For shorter grains, this is perceived as a change in the spectrum and for longer grains, as a detuning of the sample.

---



### Pitch Offset

Offsets the pitch across the channels of the sample, in semitones and cents. Positive values increase the pitch of the right channel and decrease the pitch of the left channel. Negative values increase the pitch of the left channel and decrease the pitch of the right channel. This can be used to widen the panorama of the sound.

#### NOTE

For shorter grains, this is perceived as a change in the spectrum and for longer grains as a detuning of the sample.

---

If you are working with surround files, the center channel and the LFE channel remain unchanged. The left channel and the left surround channel get the same value. The right channel and the right surround channel get the same value. Left and right are distributed symmetrically. For example, an offset of +12 semitones gives the following results:

- LFE channel: 0 semitones
- Center channel: 0 semitones
- Left channel: -12 semitones
- Left surround channel: -12 semitones
- Right channel: +12 semitones
- Right surround channel: +12 semitones

### Formant

This parameter changes the pitch of the original sample. The following applies:

- For short grain durations, where the perceived pitch depends on the grain size, changing the pitch of the underlying sample creates an effect similar to formant shifting.
- For longer grain durations, where the perceived pitch is the pitch of the original sample, the effect changes to a pitch offset.

## Grain Settings

### Number of Grains

You can specify the number of grains for each channel of the sample. At a setting of 2, the two grains are offset by 180°. Due to this phase offset, the root of the spectrum is canceled out, and the pitch increases by one octave. To compensate for this, adjust the **Position Spread**, **Position Offset**, or **Duration Spread** parameters.

### Duration

Increases the grain period by a factor ranging from 1 to 1000.

- For very short grains, the sound gets the pitch of the frequency at which the grains repeat.  
For example, the grain duration at the center key C3 is 3.82 ms. If you set the grain duration to 2, the grain period is 7.64 ms, and the pitch of the sound is one octave lower.
- When longer grains (above 30 ms) are used, the sound gets the pitch of the sample.

### Duration Random

The random grain duration is calculated separately for each channel, at the start of a new grain. This can be used to widen the panorama of the sound. At a setting of 100 %, the grain duration varies between half and twice the grain period.

### Duration Spread

If **Number of Grains** is set to a value higher than 1, this parameter modifies the grain durations by the factor that you set. This way, each grain is played with a different duration. At a setting of +100 %, the first grain is half as long and the last is twice as long. If you use negative settings, the first grain becomes longer and the last grain becomes shorter.

### Duration Offset

Offsets the grain duration across the sample channels. Positive settings result in shorter grain durations for the right channel and longer grain durations for the left channel. This can be used to widen the panorama of the sound. At a setting of 100 %, the minimum and maximum duration lie between half and twice the grain period.

If you are working with surround files, the center channel and the LFE channel remain unchanged. The left and right channels and the left and right surround channels are modified symmetrically. For example, a setting of +100 % results in the following grain duration factors:

- Center channel: 1.0
- LFE channel: 1.0
- Left channel: 1.41421
- Right channel: 0.707
- Left surround channel: 2
- Right surround channel: 0.5

### Duration Key Follow

Determines how the grain duration changes with the notes you play. It is mostly used with short durations. Longer durations sound with the original pitch of the sample and therefore, do not need to follow the keyboard.

With a **Duration** of 1 and a **Duration Key Follow** setting of 100%, the difference in pitch between two keys is one semitone, which corresponds to the standard keyboard tuning. Longer durations lead to an audible volume modulation that is different for the different keys. To apply the same volume modulation with each key, set **Duration Key Follow** to 0%.

#### NOTE

The volume modulation is only audible if the grain is long and if you only use a few grains.

---

### Center Key

In general, the grains repeat at the frequency of the center key. The grain duration corresponds to the wave length of that frequency. If you play C3 with the center key set to C3, the grains repeat at a frequency of 261.626 Hz, that is, at a grain period of 3.82 ms. You can set the center key between A-2 (122.31 ms) and G8 (0.0797 ms).

### Follow Zone Pitch

If **Follow Zone Pitch** is activated, zone pitch settings like **Octave**, **Coarse**, and **Fine**, as well as modulations like **Glide**, **Pitchbend**, or other pitch modulations, affect the duration length. A higher sample pitch leads to a shorter duration.

If **Follow Zone Pitch** is deactivated, the duration is independent from the zone pitch and determined by the grain duration settings.

## Shape and Length Settings

### Shape

Determines the shape of the grain. The shape strongly influences the spectrum of the sound. Click the display to open the pop-up menu that contains the available shapes.

### Length

Shortens the length of the grain without changing the grain duration. At a setting of 100%, the grain length corresponds to the grain duration. By decreasing the grain length, a shorter portion of the sample is played back, which results in a change in the spectrum. The pitch of the sound does not change, because the grain duration stays the same.

### Length Random

Allows you to set a random grain length. At a setting of 100%, the grain length varies between 0% and 100% of the grain duration. The random grain length is calculated for each channel of the sample separately at the start of a new grain. This can be used to widen the panorama of the sound.

### Length Spread

This parameter is available if **Number of Grains** is set to a value higher than 1. It modifies the length of the grains. With positive values, the first grain has the shortest length, and the last grain has the longest length. With negative values, the first grain has the longest length, and the last grain has the shortest length.

### Length Offset

Offsets the grain length across the sample channels. Positive settings shorten the grain length for the right channel, and the left channel remains unchanged. Negative values shorten the grain length for the left channel, and the right channel remains unchanged. This parameter can be used to widen the panorama of the sound.

If you are working with surround files, the center channel and the LFE channel remain unchanged. The left and right channels and the left and right surround channels are modified symmetrically.

## Level Settings

### Level

Adjusts the overall level of the grain oscillator. When you increase the number of grains, it might become necessary to lower the oscillator level. When you play back a very quiet portion of a sample, you can use this control to raise the level.

### Random Level

Sets a random level for each new grain. At a setting of 100%, the level varies between a factor of 0 and 2 of the original level. The random level is calculated separately for each channel of the sample, at the start of a new grain. This can be used to randomize the panorama of the sound.

### Stereo Width

Narrows the stereo width of the grain oscillator. It is applied after the grain oscillator and does not affect the stereo width of the actual sample. At a setting of 0%, the output of the grain oscillator is mono. If you are working with surround files, the center channel and the LFE channel remain unchanged. The left and right channels and the left and right surround channels are modified symmetrically.

### Auto Gain and RMS Time

- With **Auto Gain**, you can automatically adjust the level of grains using quieter sample parts.

#### NOTE

- **Auto Gain** can only be applied to RMS times of at least 6 ms.
  - By raising the gain, you can lose the dynamics of the sample.
- 
- **RMS Time** defines the time over which the audio levels are averaged. Low values will let the auto gain compensation follow faster, whereas higher values produce a smoother gain compensation.

## Sample Tab

The parameters on the grain oscillator **Sample** tab are the same as in the **Sample Oscillator** section for sample zones.



### Waveform display

Shows the waveform of the loaded sample.

For the parameters **Start Range**, **Release Start**, **Loop Start** and **Loop End**, markers are shown in the display.

- You can drag the markers in the display to change their position. To do so, position the mouse in the lower section of the marker line, so that a double-arrow is shown, and drag.

### Load/Replace Sample

Allows you to load an initial sample or to replace the current sample.

In the **Load** dialog, you can prelisten the samples.

### Playback Mode

- **Normal** – The sample is played back from beginning to end. If loops are defined, they are played back according to their loop settings.
- **Reverse** – The sample is played from end to beginning. If loops are defined, they are played back according to their loop settings.
- **One-Shot** – The sample is played back from beginning to end, regardless of any loop settings.
- **Reverse One-Shot** – The sample is played back from end to beginning, regardless of any loop settings.

In **One-Shot** and **Reverse One-Shot** mode, the zones ignore any MIDI note-off messages. All envelopes and LFOs play until their sustain is reached and then remain at this level for as long as the sample plays back. Any release segments of the envelopes and LFOs are not played. However, if you activate **One-Shot** mode in the **Envelope** section, the release nodes of the envelopes are included in the playback.

### Fixed Pitch

If a sample zone is triggered by a MIDI note other than the one defined by the **Root Key** setting, the sample is normally pitched accordingly. With **Fixed Pitch** activated, the relation between played note and root key is disregarded, and all keys play the sample, just as it was recorded.

#### NOTE

You can still apply the usual pitch modulations in the **Pitch** section and set the sample to follow the keyboard according to the **Pitch Key Follow** setting.

---

### Preload

A sample can either be loaded completely into RAM, or it can be streamed from the hard disk. If samples are streamed, HALion needs to preload a portion of these samples to be able to play a voice without having to search for the sample data first. The size of this preload buffer can be set in the **Options Editor**. The **Preload** setting allows you to adapt this buffer size for individual sample zones by setting a multiplier from 1 to 16. Increasing the buffer size is a good idea if a sample can be transposed in a wide range and HALion needs to read out the sample data faster, for example.

If you set **Preload** to its maximum, the entire sample is preloaded. This is useful for smaller samples.

### Quality

If samples are not played at their original pitch or tempo, HALion calculates the transposed versions in real time using algorithms that require different CPU performance depending on the **Quality** setting.

Changes regarding the **Quality** settings are particularly noticeable for the high frequencies. The higher the setting, the better the suppression of artifacts. For samples with little high-frequency content, you can use the **Standard** option. For programs that use different samples for every key, you can use the **Standard** option to save computing power.

If **Quality** is set to **Vintage**, you can make the following settings:

- **Rate Reduction** allows you to specify a sample frequency, to simulate the lower sample rates of early samplers.
- **Bit Reduction** allows you to apply the bit depth that was used by early samplers.
- **Turntable** emulates the memory-optimized workflow of the past, when turntables were sampled at a speed of 45 RPM to record shorter samples, and then tuned down again to compensate for the change in pitch.

If you set this parameter to **78 RPM**, you can increase the number of vintage artifacts that are generated.

### Sample Start

The start marker of the sample.

### Start Range

Determines the range for sample start offset modulation. If **Sample Start** is selected as a modulation destination in the modulation matrix, the **Start Range** parameter

controls the sample portion that is affected by the start offset modulation. If this parameter is set to zero, no sample start modulation is performed.

For example, if **Note-on Velocity** is used to modulate the **Sample Start** parameter, a high key velocity starts playback later in the sample, and the range of this modulation is determined by the **Start Range** parameter.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

#### **Link Loop Start and End**

Links the loop start and end positions. If you edit one of the values, the other one is automatically modified.

#### **Sample End**

The end marker of the sample.

#### **Release Start**

Determines the position to which the cursor jumps when you release a key.

For example, if you are playing back a sample in a loop but you want it to play its original release phase, set the **Release Start** parameter to this position.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

#### **Release Offset**

Allows you to fine-tune the release start for each sample.

This allows you to offset the release start for several zones at the same time without losing the original release settings, for example.

#### **Crossfade/Fade In/Fade Out**

Allow you to set the curve and the length of the fade in, the fade out, and the crossfade.

#### **Loop Sets A and B**

Allow you to set up two different sets of loops for the same sample. This is useful to compare different versions of the same loop, for example.

#### **Loop Mode**

Allows you to select a mode for the sustain loop and the release loop.

- If this is set to **No Loop**, the sample is played without a loop.
- If this is set to **Continuous**, the loop is played continuously until the end of the amplitude envelope.
- If this is set to **Alternate**, the loop runs back and forth, even if you release the key.
- If this is set to **Once**, the loop is repeated once.
- If this is set to **Until Release** (sustain loop only), the loop is repeated until you release the key on the keyboard.
- If this is set to **Alternate Until Release** (sustain loop only), the loop runs back and forth for as long as the key is held, and then continues to the end of the sample.

#### **NOTE**

If **Loop Mode** is set to **Alternate** or **Alternate Until Release**, the loop crossfade is applied to the loop start and the loop end. All other modes on the **Loop Mode** pop-up menu apply the loop crossfade to the loop end only.

---

### Loop Start

Defines the loop start for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Loop End

Defines the loop end for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Tuning

Sets the tuning of the loop. This is useful to adjust the frequency of the loop.

## Granular Synthesis

You can use granular synthesis to extract interesting spectra from all kinds of samples, to create sound effects by completely scrambling a sample, or to perform low-fidelity time stretching, for example.

In granular synthesis, it is not an entire sample that is played back, but only short portions of the sample, the so-called grains. These grains can be played back in any order. Each time a grain ends, a new one starts. To avoid discontinuities in the playback and to minimize artifacts, envelopes are applied to the grains. Very short grains produce sounds with an individual pitch. This means that you can also extract pitched spectra from samples without a distinct pitch, such as drum loops or sound effects. Sounds with longer grains usually play back with the pitch of the original sample.

If you repeatedly play back the same portion of a sample, the sound may become too static. To compensate for this and bring more liveliness into the sound, you can use the **Random**, **Spread**, and **Offset** parameters. By adding more grain streams, you can increase the grain and sound density to produce a richer sound.

### NOTE

You can use the following grain oscillator parameters as modulation destinations in the modulation matrix: **Grain Position**, **Grain Direction**, **Grain Duration**, **Grain Length**, **Grain Pitch**, and **Grain Level**.

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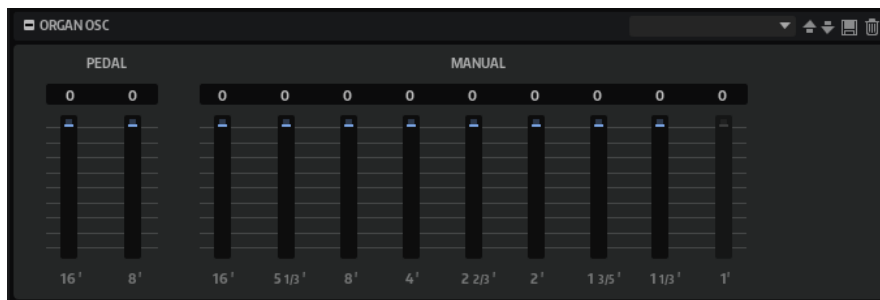
### RELATED LINKS

[Modulation Matrix](#) on page 205

## Organ Oscillator Section

Organ zones produce the sound of classic drawbar organs with up to nine drawbars. Each drawbar controls the level of a harmonic. The drawbars are named after the length of church

organ pipes, ranging from 16' to 1'. 16' is the lowest and 1' the highest harmonic. You can mix the harmonics using the drawbars to create different classic organ timbres.



### Manual

Activates the nine drawbars for the manual.

### Pedal

Activates the two drawbars for the bass pedals.

### Drawbars 16' to 1'

The faders control the level of the corresponding drawbar.

## Wavetable Section

The **Wavetable** section in the **Zone Editor** provides access to the oscillator parameters of wavetable zones. The oscillator is a combination of two wavetable oscillators, a sub oscillator, and a noise oscillator. These can be mixed with individual settings for **Level**, **Pan**, **Tuning**, etc.



The **Osc 1** and **Osc 2** tabs allow you to choose from a set of preconfigured wavetables and to define how to play them. The **Sub** tab contains the settings for the sub oscillator and the noise oscillator.

On the right side of the title bar, you can find **On/Off** buttons for the four oscillators.



### RELATED LINKS

[Wavetable Synthesis](#) on page 248



## Oscillator Tabs

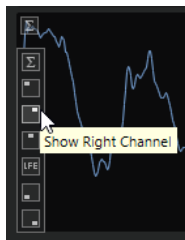
The wavetable oscillators 1 and 2 have the same parameters. For each oscillator, a separate tab is available.



### Select Wavetable

This pop-up menu allows you to select a wavetable for the wavetable oscillator. You can choose from the included wavetables and the wavetables that you created in the **Wavetable Editor**.

### Channel Selector



Allows you to select a specific channel or the sum of all channels. By default, the display shows all available channels, that is, one for mono wavetables, two for stereo wavetables, etc.

### Show 3D Wavetable Map/2D Wave

Toggles between displaying a single cycle of the current waveform and a topographic map of the entire wavetable.

### Octave

Adjusts the pitch in octave steps.

### Coarse

Adjusts the pitch in semitone steps.

### Fine

Adjusts the pitch in cent steps. This allows you to fine-tune the oscillator sound.

### Retrigger Mode

Determines the initial phase of the oscillator when you play a note.

- If **Free Phase** is selected, the behavior of analog synthesizers is emulated. The oscillator is running freely and continuously.
- If **Random Phase** is selected, the start phase is randomly set to a different value each time that you trigger a note. In contrast to **Free Phase**, there is no continuity in the phase of the waveform.

- If **Fixed Phase** is selected, the oscillator runs with a fixed start phase that can be specified by setting it to a value between 0 and 360 degrees.

### Multi Oscillator

Activates/Deactivates multi-oscillator mode. This mode allows you to create a richer sound by producing up to eight oscillators simultaneously.

- **Number** determines the number of oscillators that play back simultaneously. You can also set fractions of numbers. For example, with a setting of 2.5, you hear two oscillators at full level and a third one at half level.
- **Detune** detunes the oscillators.
- **Pan** narrows or widens the stereo panorama. With a setting of 0%, you create a mono signal, and at 100%, you create a stereo signal.
- **Spread** distributes the oscillators so that each oscillator plays from a different position in the wavetable.

#### NOTE

- The multi-oscillator settings can be modulated separately in the modulation matrix.
- The pitch distribution of the oscillators is determined by the **Distribution** control in the **Voice Control** section.

### Loop Mode

- **Off:** If **Playback Direction** is set to a positive value, the wavetable plays from the position cursor to the end.  
If **Playback Direction** is set to a negative value, the wavetable plays from the position cursor to the start.
- **On:** Depending on the **Playback Direction** setting, the wavetable plays forward or backward in a loop.
- **Alt:** The wavetable plays in an alternate loop, that is, the loop is alternately played forward and backward. The first direction depends on the **Playback Direction** setting.

### Loop Until Release

If this button is activated, the loop is repeated until you release the key on the keyboard.

If this button is deactivated, waves outside the loop are not played when you release the key.

### Legato

If **Legato** is deactivated, each note starts playback from the position cursor.

If **Legato** is activated, the first note starts playback from the position cursor, and any subsequent notes start from the current playback position, for as long as the first note is held.

This allows you to add more and more notes, all synchronized with respect to their playback position. As long as you play notes legato, the oscillator continues to run, which allows you to switch between chords without restarting the oscillator.

### Hold Last Spectrum

Activate **Hold Last Spectrum** to keep the last spectrum, once sample playback reaches the sample end or sample start, depending on the playback direction. This is especially useful if **Sustain Mode** is activated for the amplifier envelope, because the last spectrum acts like a single-cycle loop that can be played for as long as a key is held.

### **Level**

Adjusts the output level of the oscillator.

### **Pan**

Adjusts the position of the oscillator in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.

### **Auto Gain**

Allows you to automatically adjust the level of quieter sample parts. Note that by raising the gain, you can lose the dynamics of the sample.

### **Width**

Narrows the stereo width of the oscillator. At a setting of 0%, the output of the oscillator is mono.

### **Channel Spread**

Allows you to add an offset between the sample channels for stereo or surround samples.

The **Offset** value field allows you to define the offset amount.

### **Playback Direction**

Allows you to set the playback speed in smaller increments. Furthermore, this parameter determines the playback direction.

- If you enter negative values, you reverse playback, that is, the playback position moves backward through the wavetable.

### **Random Direction**

Adds a random negative or positive value to the current direction when you play a note.

For example, if you want the direction to vary between -100% and +100%, set **Direction** to 0.0% and **Random Direction** to 100.0%. If you want the direction to vary within the full positive range, set **Direction** to 50% and **Random Direction** to 50%.

### **Position**

Determines the position in the envelope where playback starts.

### **Random Position**

Adds a random value to the current position when you play a note.

For example, if you want the position to vary between 25% and 75%, set **Position** to 25% and **Random Position** to 50%.

### **Speed**

Determines the rate at which the envelope plays through the wavetables. At +100%, the envelope plays back at its original speed. A value of +50% corresponds to half the original speed, and +200% to twice the original speed, for example.

This parameter is unipolar.

### **Acceleration**

Allows you to specify the time it takes to transition from the initial playback speed set with the **Speed** parameter to the set **Target Speed**.

Higher values result in faster transitions, lower values in slower transitions. With **Acceleration** set to 0, the initial speed remains constant.

### **Target Speed**

Allows you to specify a target playback speed. The time it takes to reach this speed depends on the **Acceleration** setting.

### Speed Key Follow

Adjusts how the speed of the wavetable envelope is affected by the note that you play. Values higher than 0 increase the speed of notes above the center key and decrease the speed of notes below the center key.

For example, at a setting of 100 %, the playback is twice as fast for the octave above the center key and is half the speed for the octave below the center key. A setting of 200 % results in an envelope that is four times as fast for the octave above the center key and is a quarter of the current speed for the octave below.

#### NOTE

Negative values invert the order, that is, the speed gets lower above the center key, and higher below the center key.

---

### Sync to Host

Allows you to sync the wavetable to the beats and measures of your host application.

### Sync Mode

- If **Sync Mode** is set to **Tempo**, the playback speed is calculated using the ratio between the original tempo of the sample and the tempo of the host application.
- If **Sync Mode** is set to **Beats**, the playback speed is calculated using the note length of the beats, the number of beats, and the tempo of the host application.

### Formant Shift Settings

Formants are harmonics within the spectrum of a note which are pronounced and help to define the character of an instrument. The positions of the formants in the spectrum mainly depend on the design of an instrument, such as the body of a guitar, the shape of the vocal tract in a human body, the filter settings for electronic instruments, etc. These conditions lead to specific frequency ranges that are emphasized regardless of the pitch of the note. Playing back samples or wavetables with a pitch other than the original one is usually done by increasing or decreasing the playback speed. This leads to the well known “monster” or “Mickey Mouse” effect, because harmonics are also affected, that is, the characteristic formants are shifted. To avoid this, you can activate **Formant Shift**. In addition, you can route any available modulation source to the **Formant Shift** modulation destination in the modulation matrix. This allows you to move the formants through the spectrum with an envelope, creating filter sweep effects, for example.

#### Formant Shift On/Off

Activates/Deactivates the formant settings.

#### Formant Shift

Allows you to shift the formants of the entire wavetable by a fixed value.

#### Formant Scale

Scales the intensity of the **Formant Shift**.

If this parameter is set to 0, **Formant Shift** and **Formant Key Follow** have no effect. With negative values, the effect of the **Formant Shift** settings is inverted.

#### Formant Shift Key Follow

Allows you to shift the formants depending on the played note.

- At 100%, the formant frequency moves with the played note.
- At 0%, the formants are kept the same for all notes.

The root key for the key follow function is determined by the pitch of the original sample portion that was used to extract a wave in the wavetable. For waves with no

sample origin, such as synthetic sine, saw, or square waves, or waves of freely edited spectrums, the root is set to C3.

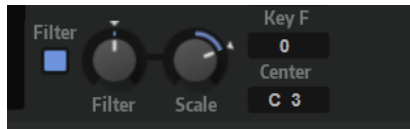
You can invert the **Formant Shift** behavior by setting **Key Follow** to negative values.

### Low Frequency Preservation

Allows you to prevent losses in the low frequencies by specifying to what degree the frequencies are to be affected by the formant filter.

If this parameter is set to 0, the formant filter affects all frequencies equally. The more you raise the value, the less the low frequencies are affected.

## Filter Settings



### Filter On/Off

Activates/Deactivates the filter.

### Filter Shift

Allows you to shift the filter curve in the frequency domain. This is similar to shifting the cutoff frequency of a classic synthesis filter.

### Filter Scale

Scales the intensity of the **Filter Shift**.

With this parameter set to 0, **Filter Shift** and **Filter Key Follow** have no effect. With negative values, the effect of the **Filter Shift** settings is inverted.

### Filter Key Follow

Allows you to adjust the **Filter Shift** parameter with the notes you play.

Set this parameter to a positive value to raise the frequencies of the filter nodes with notes above the **Center Key**. Set it to a negative value to lower the frequencies of the filter nodes with notes above the **Center Key**.

At a setting of 100, a note that is played one octave above the **Center Key** doubles the frequencies of all filter nodes, and a note one octave below the **Center Key** halves the frequencies. This means that the filter curve follows the pitch of the played note.

### Center Key

Specifies the MIDI note that is used as the central position for the **Key Follow** function.

## Sub Oscillator

The pitch of the sub oscillator is always one octave below the overall pitch of the wavetable zone. If you modulate the pitch of the wavetable zone, the pitch of the sub oscillator follows.



### On/Off

Activates/Deactivates the sub oscillator.

### Type

Determines the wave shape of the sub oscillator. You can choose **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, or **Pulse Narrow**.

### Retrigger Mode

Allows you to decide whether the sub oscillator runs freely, with a random phase each time a note is triggered, or with an adjustable start phase.

- If **Free Phase** is selected, the behavior of analog synthesizers is emulated. The oscillator is running freely and continuously.
- If **Random Phase** is selected, the start phase is randomly set to a different value each time that you trigger a note. In contrast to **Free Phase**, there is no continuity in the phase of the waveform.
- If **Fixed Phase** is selected, the oscillator runs with a fixed start phase that can be specified by setting it to a value between 0 and 360 degrees.

### Level

Adjusts the output level of the sub oscillator.

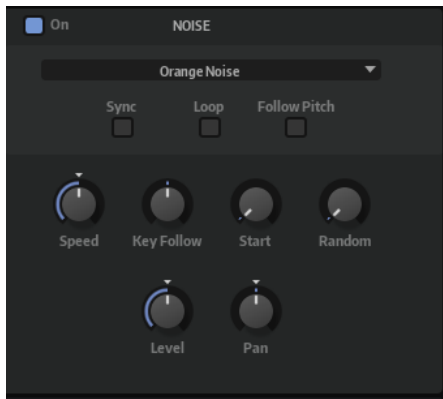
### Pan

Adjusts the position of the oscillator in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.

## Noise Oscillator

The **Noise** section offers you a large amount of different noise types that can be used to add inharmonic frequencies to the overall spectrum, either for the entire sound, with looped noises

or with one-shot noise samples. This allows you to add characteristic transients to percussive instruments based on samples, for example.



### Noise On/Off

Activates/Deactivates the **Noise** section.

### Noise Type

The sound color of the noise. You can choose between standard and band-pass filtered (**BPF**) versions of white and pink noise.

### Sync

Activate **Sync** to synchronize the speed of the noise oscillator to the host tempo. This is particularly useful for rhythmic noises that are based on a tempo of 120 BPM.

### Loop

Activate this button to play the noise sample in a loop.  
If this button is not activated, the sample is played once.

### Follow Pitch

If **Follow Pitch** is activated, zone pitch settings like **Octave**, **Coarse**, and **Fine**, as well as modulations like **Glide**, **Pitchbend**, or other pitch modulations, affect the duration length. A higher sample pitch leads to a shorter duration.

If **Follow Pitch** is deactivated, the duration is independent of the zone pitch and determined by the **Duration** settings.

### Speed

Adjusts the playback speed of the noise sample. A setting of 800.0% equals an increase of three octaves in pitch.

### Speed Key Follow

Allows you to adjust the speed modulation by MIDI note number. At a setting of +100%, the speed doubles per octave.

### Start

Adjusts the start of the noise sample. With a value of 50%, playback starts in the middle of the sample.

### Random Start

Selects a random playback start within a specific range around the current position.  
At a setting of 100%, the playback position jumps to a random position between the specified **Start** value and the end of the noise sample.

### Level

Adjusts the output level of the noise oscillator.

### Pan

Determines the position of the noise in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.

#### NOTE

**Speed**, **Level**, and **Pan** can be modulated in the modulation matrix.

---

## FM Oscillator Section

The **FM Oscillator** section is available for FM zones. It allows you to set up the frequency modulation parameters.

The **FM** section encompasses the following pages: **Level**, **Freq**, **Algo**, **Finder**, and **Import**.



## FM Synthesis

Frequency modulation refers to the modulation of one waveform by another waveform, which results in a new, more complex waveform.

### Operators

The waveforms used to create the FM sound are called operators. You can use up to eight operators. An operator can either be a carrier or a modulator.

### Carriers

Carrier operators send their signal to the output, that is, their signal is audible.

### Modulators

The signal of the modulator operators is not sent to the output, but is instead used to modulate the signal of the carrier operator.

### Algorithms

The combination of the up to eight operators forms an algorithm. The algorithm defines how many carriers and modulators are used, the order in which they are executed, whether operators feed their signal back to themselves, creating feedback connections, and more. You can either select one of the preset algorithms or create your own algorithms.



## Global FM Settings

Some parameters and settings are available for all tabs.

### Algorithm Display

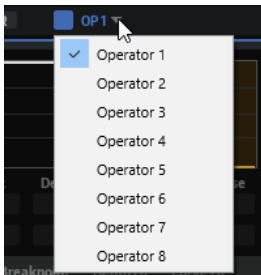
In the display on the left, a block diagram of the selected algorithm is shown.



- To select a new algorithm preset, click **Select Preset** above the display.
- To select an operator, click on it in the display.
- To activate/deactivate an operator, hold down **Shift**, and click an operator.
- To solo an operator, hold down **Ctrl/Cmd**, and click it or right-click it. If the operator is part of a chain, that is, if other modulators are connected directly or via a feedback connection, the entire chain is soloed.

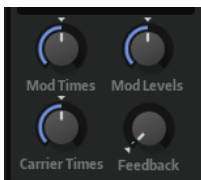
### Operator Selector

From the pop-up menu in the section title bar, you can select one of the eight operators for editing. This allows you to switch between the different operators when making settings on the **Level** and **Freq** pages, for example.



### Global Parameters

Below the display, you can find the global parameters. These allow you to quickly modify the sound of the FM algorithm without adjusting the individual operators.



#### Modulator Times Scale

Allows you to lengthen/shorten the overall level envelope time for all operators that act as modulators. This way, all operators that modify the frequency spectrum are adjusted at the same time.

### Modulator Levels Scale

Allows you to increase/decrease the output levels for all operators that act as modulators. This way, all operators that modify the frequency spectrum are adjusted at the same time.

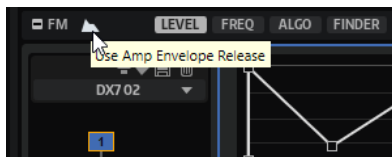
### Carrier Times Scale

Allows you to lengthen/shorten the overall level envelope time for all operators that act as carriers. This way, all operator envelopes that define the level contour of a sound are adjusted at the same time.

### Global Feedback

Allows you to scale the global intensity of all feedback signals.

## Use Amp Envelope Release



This option affects the ending of an FM voice.

If **Use Amp Env Release** is deactivated, the following applies:

- Carriers with a **Release Level** set to 0 stop playing once the level envelope reaches the end of its release. The last carrier that ends stops the voice.
- Carriers with a **Release Level** above 0 continue playing on that level.

#### NOTE

In this mode, the release segment of the amp envelope of the zone is deactivated and cannot be edited. Only the **Polyphony** setting of the layer limits the number of voices that can be played at the same time.

---

If **Use Amp Env Release** is activated, the following applies:

- Carriers with a **Release Level** set to 0 stop playing once the level envelope reaches the end of its release. However, the voice continues to play until the end of the release of the amp envelope.
- Carriers with a **Release Level** above 0 continue playing on that level. The release time and the end of voice are determined by the amp envelope.

#### NOTE

The release of a carrier may not be played in its entirety if the amp envelope release is shorter. If the amp envelope release is longer, a voice may still be active even though all carriers have reached a release level of 0.

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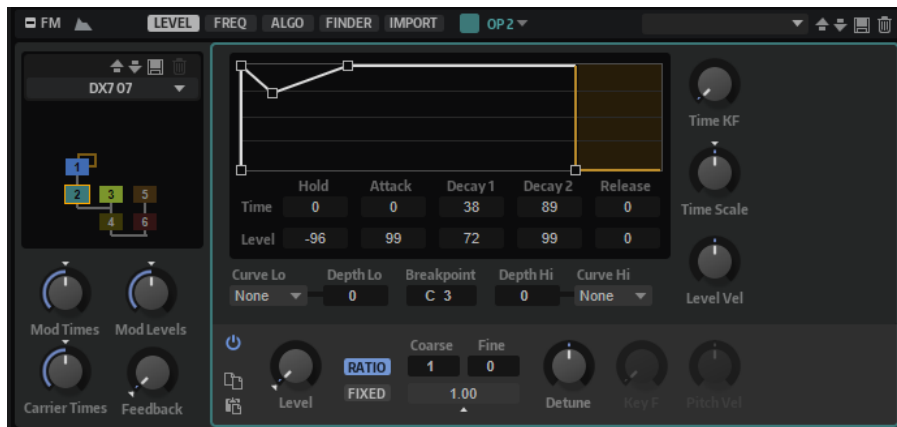
#### TIP

To use the FM oscillator like a standard synth oscillator producing a static wave, set all levels to 99, and activate **Use Amp Env Release**. This way, only the **Level** parameters of the operators are used to create the spectrum/waveform.

---

## Level Page

The **Level** page contains all level-related parameters and allows you to set up the level envelope for the FM zone. Changing the level of a carrier operator changes the volume of the signal, and changing the level of an operator changes the sound.



### Envelope Display

The graphical envelope editor at the top contains a fixed set of nodes that represent the different envelope levels and times.

#### Time

The **Time** values represent the time it takes to reach the corresponding level. For the **Hold** parameter, the value represents the time in which the envelope remains on the start level. The start level is linked to the **Release Level** setting.

#### Level

This value allows you to reduce the dynamic range of the envelope. If you change the **Level** value for the **Hold** parameter, you shift all levels of the envelope by the specified amount. This is much more convenient than shifting each level separately. You get a brighter sound if the operator is a modulator.

- To edit the envelope, drag the nodes in the editor.
- To enter a more precise value for the selected node, use the **Time** and **Level** value fields below the display.

In the value fields, you can enter numbers with up to two decimals. Note, however, that any editing you perform in the curve editor sets the values to integer values.

You can raise or lower the current value without losing the decimals by hovering the mouse over the value field and using the scroll wheel.

### Envelope Controls

#### Time Key Follow

Determines how the total envelope time is affected by the note played.

- If this is set to 0, the envelope time does not change, regardless of the note played.
- With values above 0, high notes result in a shorter, and low notes in a longer envelope time.

#### Time Scale

Allows you to lengthen/shorten the overall envelope time.

This way, you do not have to edit each individual time segment to shorten or lengthen the envelope.

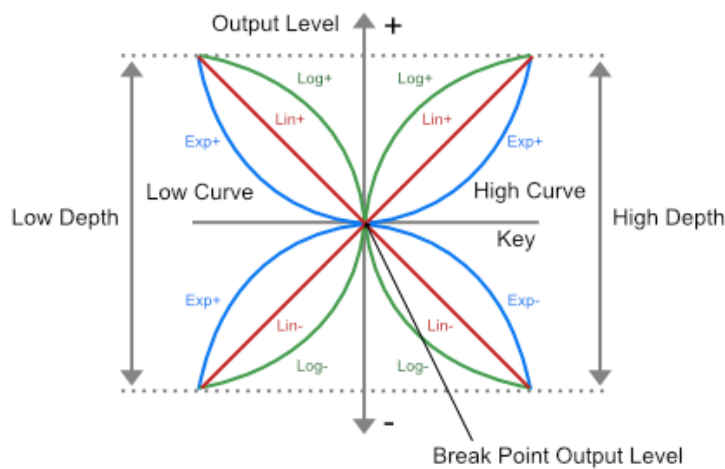
**Time Scale** is available as a modulation destination, which means that you can use a modulation source, such as **Velocity** or **MIDI controller**, for example, to control the overall envelope time.

### Level Velocity Sensitivity

Determines how the output level of the operator is affected by the played velocity.

### Level Scaling Parameters

The output of each operator can be scaled depending on the key played. The **Breakpoint** marks the key for which the output level remains unchanged. You can specify how the output level is to be raised or lowered for the keys above and below the **Breakpoint** by setting a **Depth** and a **Curve** for both key ranges.



### Key Level Curve Low

Determines the level scaling curve for the keys below the **Breakpoint**. The available curve types are linear, exponential, and logarithmic.

### Key Level Depth Low

Determines the depth of the level scaling curve for the keys below the **Breakpoint**.

### Key Level Breakpoint

Determines the pivot point of the level scaling curve.

### Key Level Depth High

Determines the depth of the level scaling curve for the keys above the **Breakpoint**.

### Key Level Curve High

Determines the level scaling curve for the keys above the **Breakpoint**. The available curve types are linear, exponential, and logarithmic.

## FM Operator Settings

### Mute Operator

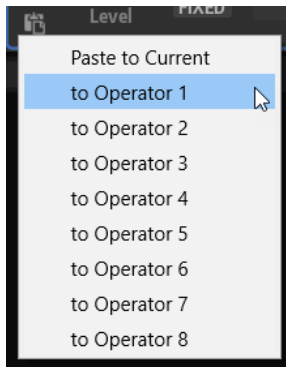
Mutes the operator. This allows you to check what the algorithm would sound like without this operator, for example.

### Copy Operator Settings

Copies the current operator settings to the clipboard.

### Paste Operator Settings

Allows you to paste the most recently copied operator settings to another operator. The copied settings can be pasted to another operator of the same or of a different FM zone.



### Operator Output Level

Allows you to set the output level of the operator.

### Ratio Frequency Mode

#### Coarse

Allows you to set the basic frequency of the operator – as a multiple of the frequency of the played notes.

#### Fine

Allows you to fine-tune the pitch of the operator. The step sizes depend on the **Coarse** setting.

#### Resulting Ratio

Shows the result of the **Coarse** and **Fine** settings.

#### Detune

Slightly detunes the pitch of the operator.

### Fixed Frequency Mode

#### Frequency

Allows you to set a fixed frequency for the operator.

#### Detune

Slightly detunes the pitch of the operator.

#### Pitch Key Follow

Determines how the pitch depends on the note played.

- With a setting of 0, all notes have the pitch set by the **Coarse** and **Fine** parameters.
- With a setting of 99, adjacent notes are pitched in semitone steps.

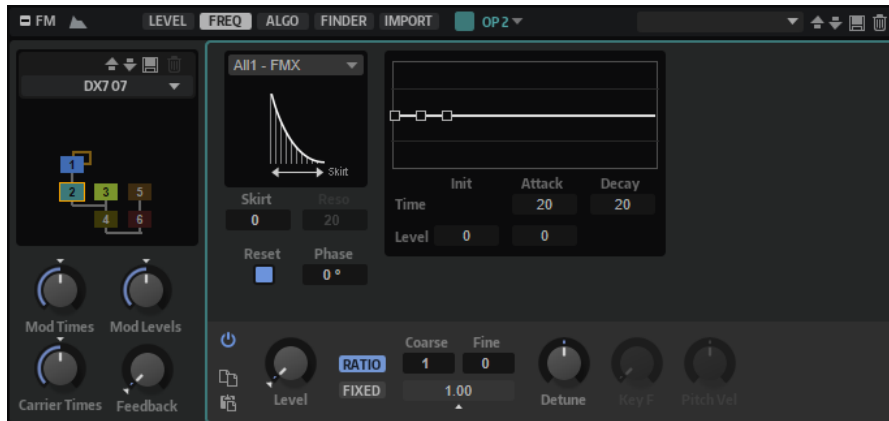
#### Pitch Velocity Sensitivity

Determines how the pitch of the operator responds to velocity.

- With positive values, the harder you hit the keys, the more the pitch rises.
- With negative values, the harder you hit the keys, the more the pitch is lowered.
- With a setting of 0, the pitch does not change.

## Freq Page

Via this page, you can set up the parameters related to frequency and pitch.



### Waveform

Allows you to select a waveform for the operator.

### Skirt

Determines the spread of the skirt at the bottom of the formant harmonics curve.

- For the **All1**, **All2**, **Odd1**, **Odd2**, **Res1**, and **Res2** waveforms, higher values produce a wider skirt, and smaller values result in a narrower skirt.
- For the **Saw** and **Saw Rounded** waveforms, **Skirt** changes the saw wave from a falling to a raising edge.
- For the **Square** and **Square Rounded** waveforms, **Skirt** changes the pulse width from square to pulse.

### NOTE

This parameter is not available for the **TX81Z**, **SY99**, **Sine**, and **Noise** waveforms.

### Resonance

Allows you to add resonance when **Waveform** is set to **Res 1** or **Res 2**. In order to do so, shift the center frequency of the wave spectrum to a higher frequency.

- With a setting of 0, the center frequency is the same as the fundamental frequency.
- With a setting of 99, the center frequency is shifted to the 100th harmonic.

### Key On Reset

Activate this parameter to reset the phase of the operator with each note played.

### Initial Phase

Adjusts the start phase of the operator waveform when **Key On Reset** is activated. The phase can be set to a value between 0 and 360°.

### Pitch Envelope

In addition to the level envelope, each operator also provides a basic pitch envelope. This envelope can be used to create different pitch attacks for different operator chains, for example, to simulate a brass section, where not all players hit the final pitch at the same time.

### Init Level

The level at which the envelope starts.

### Attack Time

The time it takes to reach the **Attack Level**.

### Attack Level

The level to which the envelope moves when a note is played.

### Decay Time

The time it takes for the envelope to fall back to a neutral level, with no change in pitch.

## FM Operator Settings

### Mute Operator

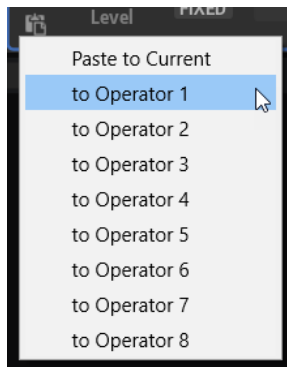
Mutes the operator. This allows you to check what the algorithm would sound like without this operator, for example.

### Copy Operator Settings

Copies the current operator settings to the clipboard.

### Paste Operator Settings

Allows you to paste the most recently copied operator settings to another operator. The copied settings can be pasted to another operator of the same or of a different FM zone.



### Operator Output Level

Allows you to set the output level of the operator.

## Ratio Frequency Mode

### Coarse

Allows you to set the basic frequency of the operator – as a multiple of the frequency of the played notes.

### Fine

Allows you to fine-tune the pitch of the operator. The step sizes depend on the **Coarse** setting.

### Resulting Ratio

Shows the result of the **Coarse** and **Fine** settings.

### Detune

Slightly detunes the pitch of the operator.

## Fixed Frequency Mode

### Frequency

Allows you to set a fixed frequency for the operator.

### Detune

Slightly detunes the pitch of the operator.

### Pitch Key Follow

Determines how the pitch depends on the note played.

- With a setting of 0, all notes have the pitch set by the **Coarse** and **Fine** parameters.
- With a setting of 99, adjacent notes are pitched in semitone steps.

### Pitch Velocity Sensitivity

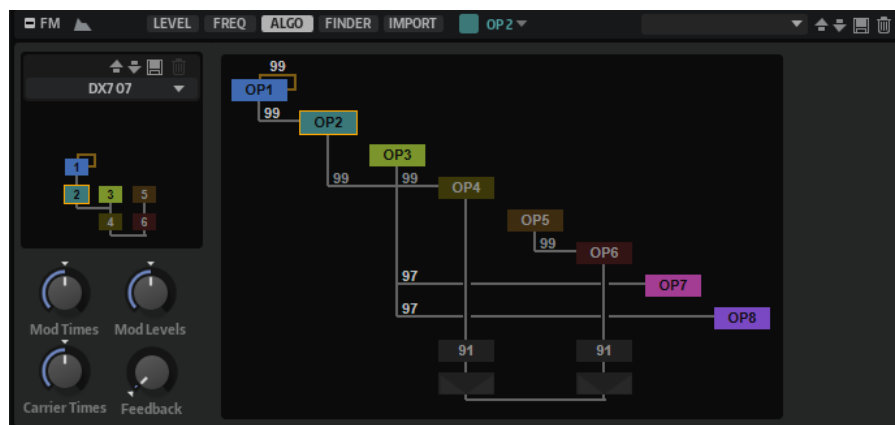
Determines how the pitch of the operator responds to velocity.

- With positive values, the harder you hit the keys, the more the pitch rises.
- With negative values, the harder you hit the keys, the more the pitch is lowered.
- With a setting of 0, the pitch does not change.

## Algo Page

The **Algo** page contains the editor for the FM algorithm. Here, you can freely connect the eight available operators. You can emulate the classic DX7 and modern FMX algorithms, for example, but you can also create our own complex algorithms.

On the right, the eight operators are shown in a diagonal line. Lines that connect operators above the diagonal line indicate feedback connections. Lines below the diagonal line indicate the modulations. At the bottom of the tab, two rows contain the **Output Level** and **Pan** controls for the carrier operators.



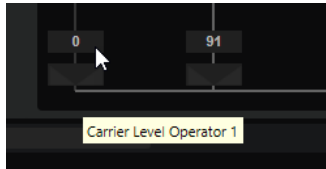
- To select a new algorithm preset, click **Select Preset** above the display.
- To select an operator, click on it in the display.
- To edit an operator, double-click it.  
This opens the **Level** page for the operator.
- To activate/deactivate an operator, hold down **Shift**, and click an operator.
- To solo an operator, hold down **Ctrl/Cmd**, and click it or right-click it. If the operator is part of a chain, that is, if other modulators are connected directly or via a feedback connection, the entire chain is soloed.
- To select a new algorithm preset, click **Select Preset** above the display.



- To select an operator, click on it in the display.
- To activate/deactivate an operator, hold down **Shift**, and click an operator.
- To solo an operator, hold down **Ctrl/Cmd**, and click it or right-click it. If the operator is part of a chain, that is, if other modulators are connected directly or via a feedback connection, the entire chain is soloed.

## Carrier Outs and Pan

Each operator can send its output directly to the output of the FM oscillator and can therefore act as a carrier.

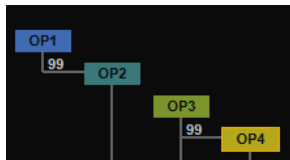


- To connect an operator to the output, move the mouse downwards to the bottom of the **Algorithm Editor**, so that the **Carrier Level** and **Carrier Pan** controls are shown. Click and drag or use the mouse wheel to set the level.
- You can use the **Carrier Pan** control to distribute different operators to different panorama positions of the stereo output of the FM zone.

## Creating Modulations

Operators can modulate operators with higher numbers by sending an amount of their signal to them.

Modulations are represented by connecting lines between the two operators below the operator diagonal.



---

### PROCEDURE

1. Position the mouse on the operator that you want to use as a modulator, and move it down until it reaches the row of the operator that you want to modulate.  
The possible connections are indicated in the display.
  2. Click and drag to establish a modulation assignment, and set the modulation level.
  3. Optional: To edit the modulation level, either use the scroll wheel or double-click the value and enter a new value manually.
- 

## Creating Feedback Loops

An operator can send its output back to its own input or to the input of an operator that precedes it. These feedback loops can create signals with a rich frequency spectrum and can even be used to create sounds similar to white noise when used with high feedback levels.

Feedback connections are represented by lines between the operator blocks in the diagram.



---

#### PROCEDURE

1. Position the mouse on the source operator, and move it straight upwards. The line indicates to which destination operator the feedback is sent.
2. Click and drag the mouse upwards or downwards to establish the feedback connection and to set the gain.

The feedback gain can be set to negative or positive values.

If you feed the output of an operator back to itself, the following applies:

- Positive values produce harmonics and sound like a sawtooth wave.
- Negative values produce mainly odd harmonics and sound like a square wave.

If the feedback extends over multiple operators, the result is different and more complex.

#### NOTE

The global **Feedback** control below the algorithm selector on the left allows you to scale all feedback levels in the algorithm at the same time.

---

## Creating Your Own Algorithms

You can create your own algorithms and save them as presets.

---

#### PROCEDURE

1. Start with a new algorithm, or load an algorithm that you want to modify.
2. Create the modulations that you want to use.
3. Create feedback loops between operators, or feed the output of an operator back to itself.
4. To save your algorithm, click **Save Preset** in the global section on the left.

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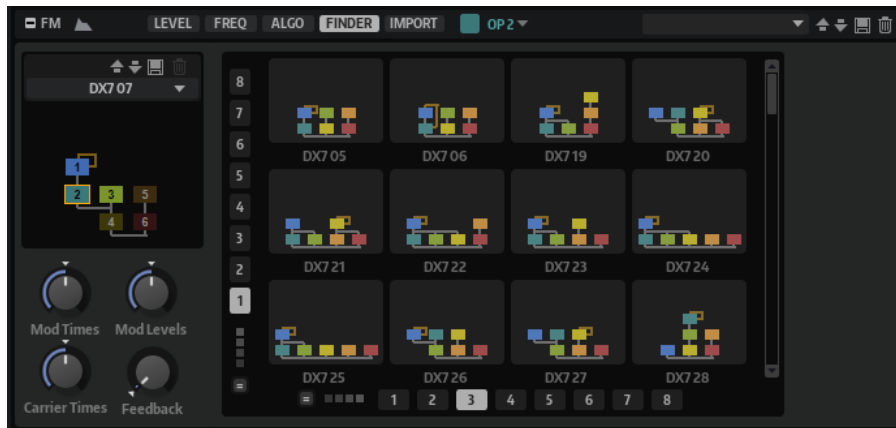
#### RESULT

The algorithm is saved in your user presets folder and is available on the **Preset** pop-up menu in the global section on the left.

## Finder Tab

Via this tab, you can search for algorithms that match two criteria: the number of carriers and the number of operators that are connected in a chain. This allows you to filter the list of algorithms according to the type of sound that you want to create.

The vertical buttons allow you to specify the minimum number of operators connected in a chain, and the horizontal row of buttons determines the number of carriers. For example, to create a sound that uses three components, an attack, a sustain, and a transient part, set the number of **Carriers** to **3**, and select one of the suggested algorithms.

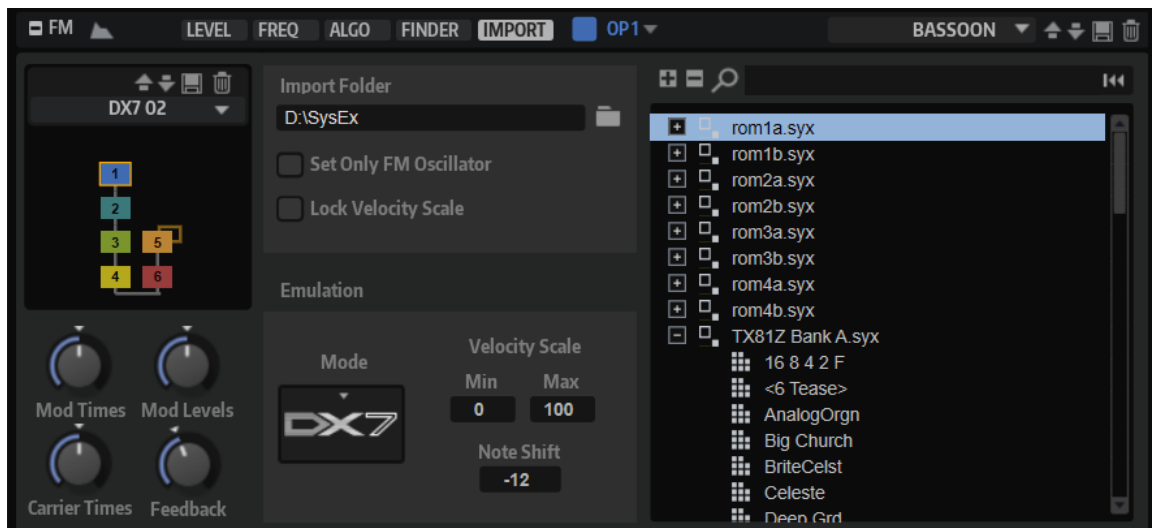


By default, the **Finder** lists all algorithms that use at least the specified number of operators/ carriers. Algorithms with more operators/carriers are also shown.

- To show only algorithms with the set number of operators in a chain, activate **Exactly Match Number of Operators in Chain**.
- To show only algorithms with the set number of carriers, activate **Exactly Match Number of Carriers**.

## Import Page

The **Import** page allows you to import original DX7 .syx files.



### Import Folder

Allows you to specify a folder that contains the DX7 files that you want to import. Once a folder is specified, it is scanned for .syx files, including all subfolders. All files that are found are displayed in the tree structure on the right.

### Set Only FM Oscillator

Allows you to import only the settings of the FM oscillator. All other zone settings remain unaffected. By default, this option is deactivated, to best match the sound of the DX7 keyboard.

### Lock Velocity Scale

Allows you to prevent changes to the **Velocity Scale Min** and **Velocity Scale Max** settings during import.

### Emulation Mode

You can choose from different emulation modes: HALion, FM-X, and DX7.

- In **HALion** mode, the oscillator works with continuous values, for maximum precision.
- **FM-X** emulates the characteristics of Yamaha's Montage synthesizers.
- **DX7** emulates the characteristics of the Yamaha DX7 synthesizer.

### Velocity Scale Min/Velocity Scale Max

Allow you to simulate the velocity range of the original DX7 keyboard. By default, **Velocity Scale Min** is set to 0, and **Velocity Scale Max** is set to 100.

- To play the preset with the full velocity range, set the parameters to 0 and 127.
- To invert the velocity, set **Velocity Scale Min** to the higher value and **Velocity Scale Max** to the lower value.

### Note Shift

Allows you to shift the incoming MIDI notes by +/- 24 semitones on importing DX7 or TX81Z .syx files.

### Result Tree

Lists the .syx files in the selected import folder. Click the plus sign on the left to show the programs contained in the file. Click a program to select it.

You can use the search filter at the top to show only programs whose names match the entered text. To remove the search text, click the **Reset Filter** button to the right of the text field.

## Importing DX7 SysEx Files

You can import .syx files to use them as they are or edit them further.

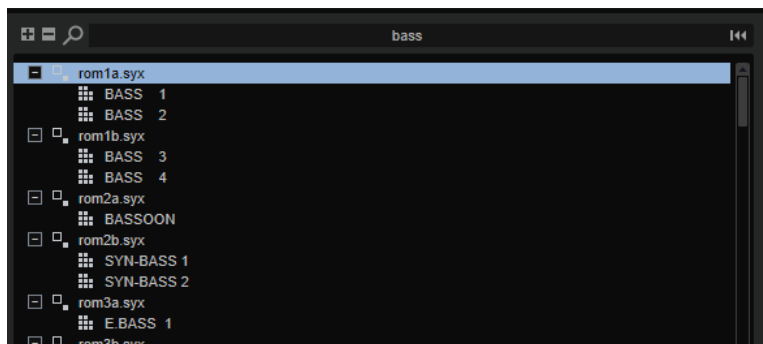
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### PROCEDURE

1. On the **Import** page, use the **Import Folder** field to specify the folder containing the .syx files.

You can either enter the path into the field or click the button on the right and navigate to the folder. When files are found in this location, they are shown on the right.

2. Click the + icon for a .syx file to access the 32 programs that it contains.
3. To search for a specific file name or instrument, enter the search text in the search field. This shows all files whose names are contained in the search text, as well as all files that contain programs whose names contain the search text.



4. Click a program to load it.
-

## Spectral Oscillator Section

The **Spectral Oscillator** section is available for spectral zones. The spectral oscillator analyzes the spectrum of the loaded sample, that is, the progression of the frequencies, amplitudes, and phases from the sample start to the end of the sample. The analyzed spectrum is used to generate a waveform for playback.

During this re-synthesis, the sample is split into its individual frequency components and overtones. These can then be filtered, amplified, or adjusted in relation to each other. The spectrum becomes independent from the original temporal progression of the sample, which means that the sound is not played faster or slower for higher or lower notes, but instead keeps its timing. Therefore, you can change the playback speed without affecting the pitch.

You can also slow down the playback speed up to the point where only a static waveform is played back. When playing other pitches than the original sample pitch, it is possible to preserve the natural formants of the sound or to tweak them independently to create more artificial variations.

### Title Bar Controls

The controls on the title bar are the same for all tabs in the **Spectral Oscillator** section.

### Wave/Spectrogram Opacity



Drag this slider all the way to the left to show the sample waveform in the display. Drag it all the way to the right to show the spectrogram. Settings in between show both waveform and spectrogram superimposed on each other.

### Trigger Note on Click in Sample Display

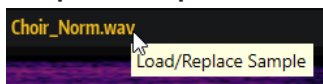


Allows you to start playback of the sample by clicking in the waveform display.

### Show Spectral Envelope (Analysis tab only)

Allows you to show/hide the formant resolution curve, which gives you visual feedback on how closely the formant envelope follows the spectrum gains.

### Load/Replace Sample



Allows you to load an initial sample or to replace the current sample.

In the **Load** dialog, you can prelisten the samples.

### Waveform/Spectrogram Display

The display at the top of the section allows you to show the sample waveform or a spectrogram of the sample, or a mixture of both.

You can blend between these two representations using the **Wave/Spectrogram Opacity** slider.

## Osc Tab

The **Osc** tab contains the oscillator parameters and settings.



### Legato

If **Legato** is deactivated, each note starts playback from the position cursor.

If **Legato** is activated, the first note starts playback from the position cursor, and any subsequent notes start from the current playback position, for as long as the first note is held.

This allows you to add more and more notes, all synchronized with respect to their playback position. As long as you play notes legato, the oscillator continues to run, which allows you to switch between chords without restarting the oscillator.

### Hold Last Spectrum

Activate **Hold Last Spectrum** to keep the last spectrum, once sample playback reaches the sample end or sample start, depending on the playback direction. This is especially useful if **Sustain Mode** is activated for the amplifier envelope, because the last spectrum acts like a single-cycle loop that can be played for as long as a key is held.

### Channel Spread

Spreads the playback position for each channel of the sample.

- For stereo files, positive values modify the playback position of the right channel, and negative values modify the playback position of the left channel. In both cases, the other channel is not affected. This can be used to widen the panorama of the sound.
- For mono files, the oscillator creates a copy of the channel. This allows you to create a stereo sound from a mono sample, for example.
- For surround files, the front left and right channels are shifted in the same way as stereo files. The shift for the rear channels is twice as large. The center and the LFE channels are not shifted and keep their original position.

### Multi Oscillator

Activates/Deactivates multi-oscillator mode. This mode allows you to create a richer sound by producing up to eight oscillators simultaneously.

- **Number** determines the number of oscillators that play back simultaneously. You can also set fractions of numbers. For example, with a setting of 2.5, you hear two oscillators at full level and a third one at half level.

- **Detune** detunes the oscillators.
- **Pan** narrows or widens the stereo panorama. With a setting of 0%, you create a mono signal, and at 100%, you create a stereo signal.
- **Spread** distributes the oscillators so that each oscillator plays from a different position in the wavetable.

NOTE

- The multi-oscillator settings can be modulated separately in the modulation matrix.
- The pitch distribution of the oscillators is determined by the **Distribution** control in the **Voice Control** section.

---

NOTE

Depending on its settings, the spectral oscillator can require more CPU power than other oscillator types. Using it in **Multi Oscillator** mode further increases the power requirements.

---

### Direction

Allows you to set the playback speed in smaller increments. Furthermore, this parameter determines the playback direction.

- If you enter negative values, you reverse playback, that is, the playback position moves backward through the sample.

### Random Direction

Adds a random negative or positive value to the current direction when you play a note.

For example, if you want the direction to vary between -100% and +100%, set **Direction** to 0.0% and **Random Direction** to 100.0%. If you want the direction to vary within the full positive range, set **Direction** to 50% and **Random Direction** to 50%.

### Position

Determines where playback starts. You can also click in the sample display to set the position.

### Random Position

Adds a random value to the current position when you play a note.

For example, if you want the position to vary between 25% and 75%, set **Position** to 25% and **Random Position** to 50%.

### Speed

Adjusts the playback speed of the sample. A setting of 800% equals an increase of three octaves in pitch. A speed of 0% plays a static spectrum at the current position.

NOTE

If you change the **Speed** parameter, you may need to manually adjust the envelope length on the envelope pages.

---

### Acceleration

Allows you to specify the time it takes to transition from the initial playback speed set with the **Speed** parameter to the set **Target Speed**.

Higher values result in faster transitions, lower values in slower transitions. With **Acceleration** set to 0, the initial speed remains constant.

### Target Speed

Allows you to specify a target playback speed. The time it takes to reach this speed depends on the **Acceleration** setting.

### Speed Key Follow

Determines how the **Speed** parameter is scaled by the played key. With a value of 0, the speed is the same for all keys. Positive values increase the speed for keys above the **Center Key** and decrease the speed for keys below the **Center Key**. Negative values decrease the speed for keys above the **Center Key** and increase the speed for keys below the **Center Key**.

For example, with **Speed Key Follow** set to 100 and **Center Key** set to C3, playing a note one octave above C3 doubles the speed, and a note one octave below C3 halves the speed.

### Sync to Tempo

Allows you to synchronize the playback speed to the tempo of the host application.

If **Sync to Tempo** is activated, the playback speed is determined by the **Speed** parameter and the tempo of the host application.

If **Sync to Tempo** is deactivated, the playback speed is determined by the **Speed** parameter only.

### Sync Mode

- If **Sync Mode** is set to **Tempo**, the playback speed is calculated using the ratio between the original tempo of the sample and the tempo of the host application.
- If **Sync Mode** is set to **Beats**, the playback speed is calculated using the note length of the beats, the number of beats, and the tempo of the host application.

### Purity

Allows you to adjust the spectral purity of the sound. At 0%, you hear the original sound.

- Positive values increase the level differences between partials, which results in a pure sound.
- Negative values decrease the level differences between partials, which results in a noisy, impure sound.

### Inharmonicity

This parameter scales the frequency offsets of all partials. The effect of this parameter largely depends on whether frequency offsets exist in the signal. If a sound is strictly harmonic, that is, if there are no frequency offsets, the **Inharmonicity** control does not have an effect.

The frequencies of the partials are compared to the harmonic series, starting two octaves below the played pitch. If a sound is not strictly harmonic, the frequencies of some of the partials are offset to match the frequencies of the assumed harmonic series.

At 0%, only harmonic frequencies are allowed. At +100%, you hear the original sound. At +200%, the frequencies are assigned twice the frequency offset. Negative values invert the frequency offsets accordingly.

### Auto Gain

Allows you to automatically adjust the level of quieter sample parts. Note that by raising the gain, you can lose the dynamics of the sample.



### **Level**

Adjusts the output level of the oscillator. This is used to compensate for level losses or increases caused by the spectral filter, for example.

### **Width**

Narrows the stereo width of the oscillator. At a setting of 0%, the output of the oscillator is mono.

## **Formant Shift Settings**

Formants are harmonics within the spectrum of a note which are pronounced and help to define the character of an instrument. The positions of the formants in the spectrum mainly depend on the design of an instrument, such as the body of a guitar, the shape of the vocal tract in a human body, the filter settings for electronic instruments, etc. These conditions lead to specific frequency ranges that are emphasized regardless of the pitch of the note. Playing back samples or wavetables with a pitch other than the original one is usually done by increasing or decreasing the playback speed. This leads to the well known “monster” or “Mickey Mouse” effect, because harmonics are also affected, that is, the characteristic formants are shifted. To avoid this, you can activate **Formant Shift**. In addition, you can route any available modulation source to the **Formant Shift** modulation destination in the modulation matrix. This allows you to move the formants through the spectrum with an envelope, creating filter sweep effects, for example.

### **Formant Shift On/Off**

Activates/Deactivates the formant settings.

### **Formant Shift**

Allows you to shift the formants of the spectrum.

### **Formant Scale**

Scales the intensity of the **Formant Shift**.

If this parameter is set to 0, **Formant Shift** and **Formant Key Follow** have no effect. With negative values, the effect of the **Formant Shift** settings is inverted.

### **Formant Shift Key Follow**

Allows you to shift the formants based on the played pitch.

- At 100%, the formants follow the pitch.
- At 0%, the formants remain static.

To emulate the rather static formant characteristics of real instruments, start by setting this value to 0, and slowly raise it until you obtain the desired formants when playing notes in different key ranges.

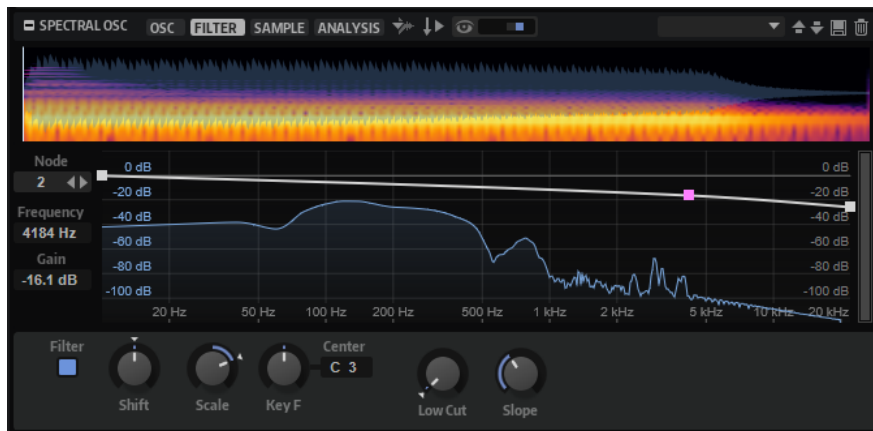
### **Low Frequency Preservation**

Allows you to prevent losses in the low frequencies by specifying to what degree the frequencies are to be affected by the formant filter.

If this parameter is set to 0, the formant filter affects all frequencies equally. The more you raise the value, the less the low frequencies are affected.

## Filter Tab

The **Filter** tab contains a spectral filter that allows you to shape the overall spectrum of the sound.



### Node

Displays the selected node. You can use the arrow buttons to switch between nodes.

### Frequency

Sets the frequency of the selected node.

### Gain

Sets the gain of the selected node.

### Filter On/Off

Activates/Deactivates the filter.

### Filter Shift

Allows you to shift the filter curve in the frequency domain. This is similar to shifting the cutoff frequency of a classic synthesis filter.

### Filter Scale

Scales the intensity of the **Filter Shift**.

With this parameter set to 0, **Filter Shift** and **Filter Key Follow** have no effect. With negative values, the effect of the **Filter Shift** settings is inverted.

### Filter Key Follow

Allows you to adjust the **Filter Shift** parameter with the notes you play.

Set this parameter to a positive value to raise the frequencies of the filter nodes with notes above the **Center Key**. Set it to a negative value to lower the frequencies of the filter nodes with notes above the **Center Key**.

At a setting of 100, a note that is played one octave above the **Center Key** doubles the frequencies of all filter nodes, and a note one octave below the **Center Key** halves the frequencies. This means that the filter curve follows the pitch of the played note.

### Center Key

Specifies the MIDI note that is used as the central position for the **Key Follow** function.

### Low Cut

Allows you to adjust the damping of low frequencies. The higher the amount, the more low frequencies are cut.

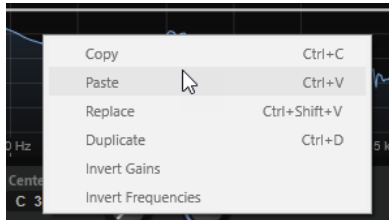
**Low Cut** does not work like a classic filter with a fixed cutoff frequency. Instead, it takes into account the current frequencies in the sample. For example, if you set this

parameter to 10%, the low frequencies that occupy 10% of the overall energy in the spectrum are removed. This is especially useful to remove low rumbling sounds that can become audible when you apply pitch shift towards higher pitches. At higher values, **Low Cut** can produce more drastic effects.

### Slope

Allows you to set the slope of the filter, that is, to determine how fast frequencies within the low-cut range are attenuated.

## Context Menu



### Copy

Copies the selected nodes to the clipboard.

### Paste

Pastes the copied nodes at the insert position.

### Replace

Replaces the selected nodes with the nodes from the clipboard.

### Duplicate

Duplicates the selected nodes.

### Invert Gains

Flips the **Gain** values of the nodes around the vertical center of the selection. This way, you can turn a filter bump into a filter dip, for example.

### Invert Frequencies

Flips the nodes around the horizontal center of the selection. This way, you can mirror the symmetry of an asymmetrical filter shape, for example, to turn a low-pass filter into a high-pass filter.

## Editing the Filter Curve

By adding nodes and moving them, you can create your own filter curves.

---

### CHOICES

- To add a node, double-click in the graphical display.
- To remove a node, double-click it.
- To move a node, drag it to another position.

### NOTE

If multiple nodes are selected, they are moved together.

- 
- To change the frequency of a node, select it, and enter a new value in the **Frequency** field. This is the same as dragging the node horizontally.

NOTE

If multiple nodes are selected, they are moved relative to each other, that is, the distances between the nodes are maintained.

- To change the gain of a node, select it, and enter a new value in the **Gain** field. This is the same as dragging the node vertically.

NOTE

If multiple nodes are selected, they are set to the same gain.

- To copy one or several nodes, select the nodes, open the context menu, and select **Copy**. To paste the nodes from the clipboard, click at the position where you want to insert the nodes, open the context menu, and select **Paste**. To replace nodes with the nodes copied to the clipboard, select the nodes that you want to replace, open the context menu, and select **Replace**.
- To flip the **Gain** values of the nodes around the vertical center of the selection, open the context menu, and select **Invert Gains**.
- To flip the nodes around the horizontal center of the selection, open the context menu, and select **Invert Frequencies**.

## Sample Tab

The **Sample** tab contains the sample and loop parameters.



### Waveform display

Shows the waveform of the loaded sample.

For the parameters **Start Range**, **Release Start**, **Loop Start** and **Loop End**, markers are shown in the display.

- You can drag the markers in the display to change their position. To do so, position the mouse in the lower section of the marker line, so that a double-arrow is shown, and drag.

### Playback Mode

- **Normal** – The sample is played back from beginning to end. If loops are defined, they are played back according to their loop settings.
- **Reverse** – The sample is played from end to beginning. If loops are defined, they are played back according to their loop settings.

- **One-Shot** – The sample is played back from beginning to end, regardless of any loop settings.
- **Reverse One-Shot** – The sample is played back from end to beginning, regardless of any loop settings.

In **One-Shot** and **Reverse One-Shot** mode, the zones ignore any MIDI note-off messages. All envelopes and LFOs play until their sustain is reached and then remain at this level for as long as the sample plays back. Any release segments of the envelopes and LFOs are not played. However, if you activate **One-Shot** mode in the **Envelope** section, the release nodes of the envelopes are included in the playback.

### Fixed Pitch

If a sample zone is triggered by a MIDI note other than the one defined by the **Root Key** setting, the sample is normally pitched accordingly. With **Fixed Pitch** activated, the relation between played note and root key is disregarded, and all keys play the sample, just as it was recorded.

#### NOTE

You can still apply the usual pitch modulations in the **Pitch** section and set the sample to follow the keyboard according to the **Pitch Key Follow** setting.

---

### Sample Start

The start marker of the sample.

### Sample End

The end marker of the sample.

### Link Sample Start and End

Links the sample start and end positions. If you edit one of the values, the other value is automatically modified.

#### NOTE

You cannot change the sample start or end positions beyond the limits of the sample file. For example, if the end of the sample is reached and you raise the **Sample Start** value, the **Sample End** value is not modified.

---

### Start Range

Determines the range for sample start offset modulation. If **Sample Start** is selected as a modulation destination in the modulation matrix, the **Start Range** parameter controls the sample portion that is affected by the start offset modulation. If this parameter is set to zero, no sample start modulation is performed.

For example, if **Note-on Velocity** is used to modulate the **Sample Start** parameter, a high key velocity starts playback later in the sample, and the range of this modulation is determined by the **Start Range** parameter.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

### Release Start

Determines the position to which the cursor jumps when you release a key.

For example, if you are playing back a sample in a loop but you want it to play its original release phase, set the **Release Start** parameter to this position.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

### Release Offset

Allows you to fine-tune the release start for each sample.

This allows you to offset the release start for several zones at the same time without losing the original release settings, for example.

### Crossfade/Fade In/Fade Out

Allow you to set the curve and the length of the fade in, the fade out, and the crossfade.

### Loop Sets A and B

Allow you to set up two different sets of loops for the same sample. This is useful to compare different versions of the same loop, for example.

### Loop Mode

Allows you to select a mode for the sustain loop and the release loop.

- If this is set to **No Loop**, the sample is played without a loop.
- If this is set to **Continuous**, the loop is played continuously until the end of the amplitude envelope.
- If this is set to **Alternate**, the loop runs back and forth, even if you release the key.
- If this is set to **Once**, the loop is repeated once.
- If this is set to **Until Release** (sustain loop only), the loop is repeated until you release the key on the keyboard.
- If this is set to **Alternate Until Release** (sustain loop only), the loop runs back and forth for as long as the key is held, and then continues to the end of the sample.

#### NOTE

If **Loop Mode** is set to **Alternate** or **Alternate Until Release**, the loop crossfade is applied to the loop start and the loop end. All other modes on the **Loop Mode** pop-up menu apply the loop crossfade to the loop end only.

---

### Loop Start

Defines the loop start for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Loop End

Defines the loop end for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Link Loop Start and End

Links the loop start and end positions. If you edit one of the values, the other one is automatically modified.

### Crossfade

Allows you to introduce a crossfade between loop end and loop start. Crossfades allow for smoother transitions.

### Curve

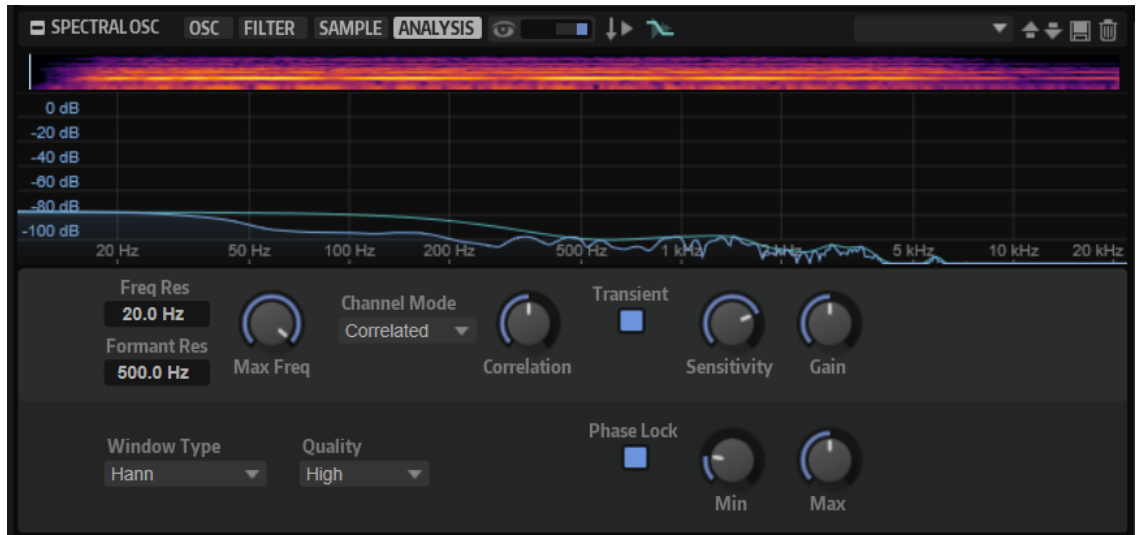
Allows you to create a linear curve, an equal power curve, or anything in between for the crossfade.

## Tuning

Sets the tuning of the loop. This is useful to adjust the frequency of the loop.

## Analysis Tab

On the **Analysis** tab, you can adjust the time stretching algorithm that is used for the spectral zone, which means that you define the audio quality of the zone. For example, you can minimize unwanted artifacts or explicitly allow them to generate special sound effects.



## Spectrum Display

The spectrum display shows the spectrum at the current playback position. To adjust the position, click in the small wave/spectrogram display at the top. Furthermore, the display shows the formant resolution curve, which gives you visual feedback on how closely the formant envelope follows the spectrum gains.

## Analysis Window

Before a sample is transformed into the spectral domain, an analysis window must be applied. The shape and size of this window determines how well the frequencies in the sample can be observed. If the window is not large enough, the frequency resolution is too low, the sound is unstable, and you hear artifacts that are often described as musical noise. Temporal events such as transients also depend on the window size.

The larger the window size, the lower the temporal resolution. A low temporal resolution results in less sharp, sometimes blurred-sounding transients. The effect of this can be heard as pre and post echos around transients in the time-stretched audio. This window is defined by the parameters **Frequency Resolution** and **Window Type**.

### Frequency Resolution

This parameter specifies how close two frequencies can be for them to be reliably detected, and it determines the lowest detectable frequency in the sample. The window size automatically adapts to the sample rate of the analyzed sample. For example, the window size for a 96 kHz sample is twice as large as the window size for a sample with 48 kHz.

- If you experience unstable sound or musical noise, try to increase the frequency resolution (< 20 Hz).

- If you hear pre and post echos around transients, try to decrease the frequency resolution (> 20 Hz).

### Max Frequency

Allows you to limit the playback to the frequency range that is effectively used. This way, it is not necessary to compute the full spectrum, which can reduce the required processing power.

### Window Type

Allows you to select the window type. This affects the shape of the window, which in turn influences the frequency resolution. This parameter also determines the amount of suppression of noise artifacts during the analysis.

The window types on the menu are sorted from the best frequency resolution with the lowest artifact suppression (**Rectangle**) to the lowest frequency resolution with best artifact suppression (**Blackman-Harris**).

Try out different **Window Type** settings to find the overall frequency resolution and artifact suppression that suits your work.

## Transient Detection

Transient detection preserves transients and minimizes artifacts, such as the smearing of transients.

### Transient Detection On/Off

Activate this parameter to minimize artifacts around the transients.

### Transient Sensitivity

**Transient Sensitivity** sets a sensitivity for the transient detection. The higher the value, the more transients are detected. The detected transients are unaffected by time stretching, which results in a more defined sound.

Different types of samples need different amounts of transient sensitivity. For example, drums need a high **Transient Sensitivity** setting, but vocals also sound clean with a lower **Transient Sensitivity** setting. Reduce the **Transient Sensitivity** if you are faced with artifacts, such as double transients in drum loops, or if you hear clicks or pops in your samples.

At 0%, no transients are detected.

### Transient Gain

Adjusts the gain that the detected transients are played with.

Higher values accent the transients, lower values soften them.

## Phase Lock

**Phase Lock** keeps the phases as close to the original sample as possible. Without phase locking, the original phase of the sample can get lost, resulting in a “smearing” sound. The time-stretching algorithm adaptively uses the optimum **Phase Lock** amount between the set minimum and maximum values.

### Phase Lock On/Off

Activates/Deactivates phase locking.

#### TIP

Deactivate **Phase Lock** to free CPU time if you want to use the **Multi-Oscillator** mode of the Spectral zone.

---



### Phase Lock Min/Phase Lock Max

These parameters determine the minimum and the maximum amount of phase locking during playback.

#### NOTE

If **Phase Lock Min** is greater than **Phase Lock Max**, the time-stretch algorithm uses the fixed amount of **Phase Lock Min**.

---

### Channel Mode and Correlation

The correlation between the left and right stereo channels can get lost, resulting in a much wider stereo image. While this can be interesting for sound design, it is undesirable for loops of acoustic drums, for example.

#### Channel Mode

Determines how the channels are treated.

- If **Independent** is selected, each channel is treated separately, and the channel correlation is not restored.
- Select **Correlated** to restore the correlation for complex material.
- Select **Joint** to restore the correlation when you are working with material where you seek a very stable mid.

#### Channel Correlation

Allows you to set the amount of channel correlation that is restored when **Correlated** or **Joint** is selected as the **Channel Mode**.

### Pitch Shifting

The time stretching algorithm that is used for the spectral zone is also capable of altering the pitch of the sample independently from its length.

#### Resample Quality Mode

This parameter determines the resample quality for pitch-shifting. With a playback speed above 75% and pitch intervals below  $-/+1$  octave, you can use the settings **Standard** and **High**. If you want to apply more pitch shifting, that is, if the playback speed is below 75% and the pitch intervals are above  $-/+1$  octave, use **Best**.

#### NOTE

The higher this setting, the more CPU time is required.

---

### Presets

With the preset controls in the top right, you can save the settings of the **Analysis** tab, to quickly adapt them to different sample material or to change the playback performance requirements, for example.

## Filter Section

The **Filter** section for synth, sample, grain, and wavetable zones allows you to adjust the tone color of the sound.



### Filter Mode

The buttons on the left determine the overall filter structure.

- **Single Filter** uses one filter with one selectable filter shape.
- **Dual Filter Serial** uses two separate filters connected in series.  
You can select the filter shapes for each filter independently. The parameters **Cutoff** and **Resonance** control both filters simultaneously. However, you can offset these parameters for the second filter with the parameters **CF Offset** and **Res Offset**.
- **Dual Filter Parallel** uses two separate filters connected in parallel.  
You can select the filter shapes for each filter independently. The parameters **Cutoff** and **Resonance** control both filters simultaneously. However, you can offset these parameters for the second filter with the parameters **CF Offset** and **Res Offset**.
- **Morph 2** morphs between filter shape **A** and **B**.  
Adjust the morphing with the **Morph Y** parameter.
- **Morph 4** morphs sequentially from filter shape **A** to **D**.  
Adjust the morphing with the **Morph Y** parameter.
- **Morph XY** morphs freely between the filter shapes **A**, **B**, **C**, and **D**.  
Adjust the morphing with the **Morph X** and **Morph Y** parameters.

### NOTE

The filter types **HALion 3** and **Waldorf** always use **Single** filter mode.

### Filter Type

Specifies the basic sound character of the filter.

- **Off** deactivates the filter section.
- **Classic** offers 24 filter shapes with resonance.
- **Tube Drive** adds warm, tube-like distortion. You can set the amount of tube drive with the **Distortion** parameter.
- **Hard Clip** adds bright, transistor-like distortion. You can set the amount of hard clipping with the **Distortion** parameter.
- **Bit Red** (Bit Reduction) adds digital distortion by means of quantization noise. You can adjust the bit reduction with the **Distortion** parameter.
- **Rate Red** adds digital distortion by means of aliasing. You can adjust the rate reduction with the **Distortion** parameter.

- **Rate Red KF** adds digital distortion by means of aliasing. In addition, **Key Follow** is used. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.
- **HALion 3** offers the five legacy filter shapes from HALion 3.
- **Waldorf** offers 13 filter shapes, including two comb filters.
- **Eco** is a performance-optimized low-pass filter without **Resonance** or **Distortion** parameters. It allows you to adapt the brilliance of samples for different velocity layers of the same key, for example.

#### NOTE

Filters without distortion use less processing power.

---

### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.
- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Cutoff

Controls the cutoff frequency of the filter.

### X/Y Control

Allows you to adjust two parameters simultaneously.

- For the filter types **Single**, **Dual Serial**, and **Dual Parallel**, the X/Y control adjusts the cutoff frequency on the horizontal axis and the resonance on the vertical axis.
- For the filter types **Morph 2** and **Morph 4**, the X/Y control adjusts the morphing between the filter shapes on the vertical axis. The horizontal axis adjusts the cutoff frequency.
- For **Morph XY**, the X/Y control adjusts the morphing between the filter shapes **AD** and **BC** on the horizontal axis, and **AB** and **DC** on the vertical axis.

#### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

#### Distortion

Adds distortion to the signal. The effect largely depends on the selected filter type. At higher settings, it creates a very intense distortion effect.

#### NOTE

This parameter is only available for the filter types **Tube Drive**, **Hard Clip**, **Bit Red**, **Rate Red**, and **Rate Red KF**.

---

#### CF Offset

For the dual filters, this parameter allows you to offset the cutoff frequency of the second filter, that is, of filter shape B.

#### Res Offset

For the dual filters, this parameter allows you to offset the resonance of the second filter, that is, of filter shape B.

#### Cutoff Velocity

Controls the cutoff modulation from velocity.

#### Norm

Allows you to normalize the velocity values that are used to modulate the filter. This means that the velocity range for the zone is remapped to a full velocity range.

For example, if a zone ranges from 40 to 80 on the mapping velocity scale, an incoming velocity of 40 results in a velocity value of 0 being sent to the cutoff, an incoming velocity of 80 results in 127. This way, you can adapt velocity-layered zones in such a way that each zone starts with a damped filter setting, with the filter opening completely towards the zone above.

#### Fatness

For the **Waldorf** and **HALion 3** filter types, this parameter adds a warm, tube-like filter distortion to the signal.

#### Envelope Amount

Controls the cutoff modulation from the filter envelope.

#### Cutoff Key Follow

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

#### Center Key

Specifies the MIDI note that is used as the central position for the **Key Follow** function.

#### Bypass Filter Envelope

Allows you to listen to the zone without modulation of the filter envelope.

### Bypass Filter

Allows you to listen to the zone without any filtering.

## Amplifier Section

The **Amplifier** section has two tabs: **Main** and **AUX**. The **Main** tab gives you access to the level and pan settings of the zone. The **AUX** tab allows you to send the zone to the four global AUX busses and to route the zone to one of the plug-in output busses.

### Main Tab



#### Level

Specifies the loudness of the zone.

#### Headroom

Specifies the headroom for polyphonic playback. By default, HALion uses a headroom of 12 dB. For monophonic programs, such as drum loops, set the headroom to 0 dB. If you work with low polyphony values, a headroom of 6 dB is sufficient.

#### Expression

If this button is activated, incoming MIDI expression controller and controller #7 data is used to calculate the voice amplitude. This ensures a correct behavior when working with General MIDI files, for example.

#### Level Key Follow

Allows you to control the volume depending on the note pitch. Positive values mean that, the higher the notes you play, the more the volume is raised. With negative values, higher notes result in lower volume.

#### Center Key

Specifies the MIDI note that is used as the center position for **Level Key Follow**.

#### Pan

Determines the position of the sound in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.

#### Mode

With this option, you can specify loudness variations across the stereo panorama.

- If this parameter is set to **0 dB**, it works like a balance control.  
Setting the pan control towards the left fades out the right channel and vice versa. At the center position, the loudness is not cut.
- With this parameter set to **-3 dB**, the option uses the cosine/sine pan law.  
The loudness is cut by -3 dB at the center position, but the energy is preserved when moving the source signal across the stereo panorama. The **-3 dB** option sounds more natural. The transition from hard left to hard right sounds much smoother than with the **0 dB** or the **-6 dB** setting.
- With this parameter set to **-6 dB**, this option uses the linear pan law.  
The loudness is cut by -6 dB at the center position, and the energy is not preserved when moving the source signal across the stereo panorama. The **-6 dB** option

sounds more synthetic. The transition from hard left to hard right sounds more abrupt than with the **-3 dB** setting.

- With this parameter set to **Off**, no panning is applied.

### Random Pan

Allows you to offset the pan position randomly with each played note. Higher values cause stronger variations. At a setting of 100%, the random offsets can vary from fully left to fully right.

### Alternate Pan

Allows you to alternate the pan position each time that you play a note. To start panning on the left, use negative values. Use positive values to begin on the right. At a setting of +100%, the first note plays hard right, the second note hard left, and so on.

### Reset

The initial pan position is set once, on startup. Subsequently, each note that you play is counted to determine the next pan position. To reset this counter, click the **Reset** button.

### Pan Key Follow

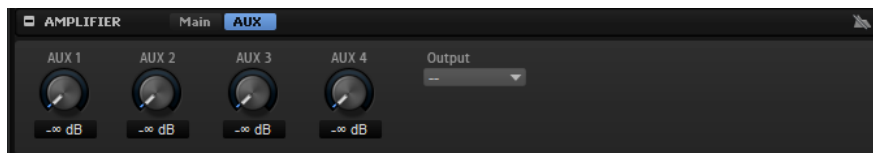
Allows you to adjust the pan modulation via the MIDI note number. Set this parameter to positive values to offset the pan position towards the right for notes above, and towards the left for notes below the center key. Use negative values to offset the pan position towards the left for notes above, and towards the right for notes below the center key.

At the maximum setting of +200%, the pan position moves from hard left to hard right within two octaves: Fully left is reached one octave below, and fully right is reached one octave above the center key.

### Center Key

Specifies the MIDI note that is used as the center position for **Pan Key Follow**.

## AUX Tab



### AUX 1-4

If you send the zone signal to one of the local AUX busses, you can control the signal level that is sent to the busses via the controls **AUX 1-4**.

### Output

Zones can be routed to one of the following destinations:

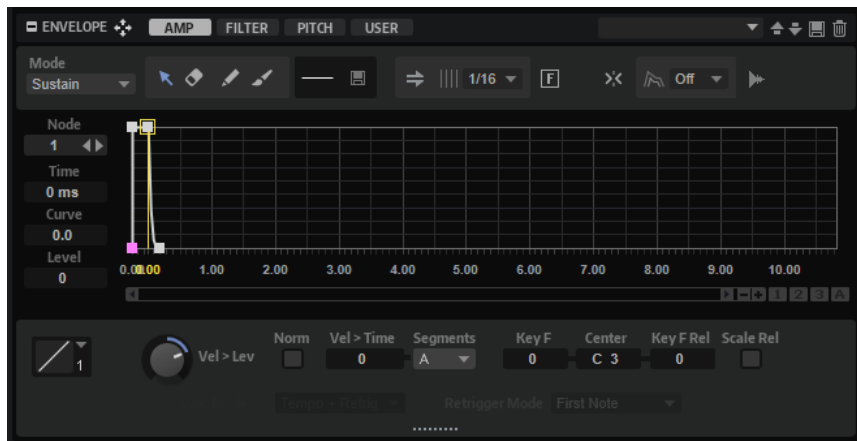
- Busses that are higher up in the hierarchy of the program.  
This includes the plug-in outputs, but not the bus that is set for the program slot or global AUX busses.
- Busses that are part of the same layer and that have been inserted after this zone or bus.

If you route a zone directly to one of the output busses, it does not pass through the layer, program, and slot busses.



## Envelope Section

The **Envelope** section gives you access to the envelopes of the zone. Each envelope is a multi-segment envelope with up to 512 nodes.

For synth, sample, grain, wavetable, FM, and spectral zones, the **Amp**, **Filter**, **Pitch**, and **User** envelopes are available. For organ zones, the **Amp** envelope is available.

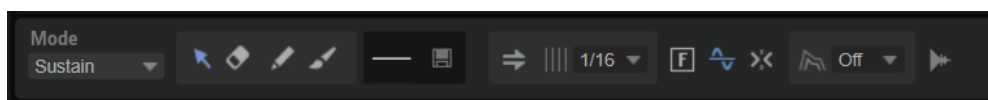


The **Amp**, **Filter**, and **Pitch** envelopes are pre-assigned to the amplitude, the filter cutoff frequency, and the pitch of the zone. The **User** envelope is freely assignable.

- Click **Amp** to display the parameters of the amplifier envelope.  
The amplifier envelope shapes the volume over time.
- Click **Filter** to display the parameters of the filter envelope.  
The filter envelope controls the cutoff frequency to shape the harmonic content over time.
- Click **Pitch** to display the parameters of the pitch envelope.  
The pitch envelope modulates the pitch over time.  
You can switch the polarity of the pitch envelope from unipolar to bipolar, and vice versa. With **Bipolar**  activated, you can use negative and positive values to bend the pitch.
- Click **User** to display the parameters of the freely assignable user envelope.  
You can switch the polarity of the user envelope from unipolar to bipolar, and vice versa. With **Bipolar**  activated, you can use negative and positive values, for example, to modulate the pan from left to right.

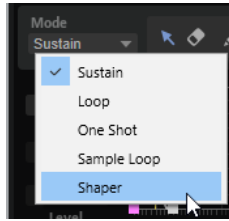
You can use all envelopes as sources in the modulation matrix.

### Toolbar



### Mode

Determines how the envelope is played back when it is triggered.



- Select **Sustain** to play the envelope from the first node to the sustain node. The sustain level is held for as long as you play the note. When you release the note, the envelope continues with the stages following the sustain. This mode is ideal for looped samples.
- Select **Loop** to play back the envelope from the first node to the loop nodes. As a result, the loop is repeated for as long as you hold the key. When you release the note, the envelope continues playing the stages that follow the sustain. This mode is ideal for adding motion to the sustain of the envelope.
- Select **One Shot** to play the envelope from the first to the last node, even if you release the key. The envelope has no sustain stage. This mode is ideal for drum samples.
- Select **Sample Loop** to preserve the natural attack of the sample. The decay of the envelope does not start until the sample has reached the sample loop start. If you set the second node to the maximum level and use the subsequent nodes to shape the decay during the loop phase of the sample, the envelope only affects the loop phase. The attack of the envelope is still executed.

NOTE

**Sample Loop** mode is only available for sample zones.

- Select **Shaper** to use the envelope as a modulator that allows you to create freely programmable cyclic modulations. To ensure a seamless cycle, the start and end node levels are linked.
  - The **Pitch**, **Filter**, and **User** envelopes continue to be played in a loop after releasing notes, which makes it possible to use the modulation in the **Release** phase of a note.
  - The **Amp** envelope immediately stops playing when notes are released.

NOTE

The end node of the **Amp** envelope does not need to have a level of zero. However, when switching from **Shaper** mode to another mode, the end node level is set back to zero.

**Shaper** mode allows you to sync the envelope to the host tempo and to retrigger it when playing notes.

NOTE

In **Shaper** mode, modulating the envelope times affects all times equally. Therefore, the **Segments** parameter is not available.

---

### Edit

Allows you to edit single or multiple nodes.

### Erase

Allows you to delete envelope nodes.



### Draw

Allows you to insert a predefined envelope shape.

You can enter shapes by clicking or by clicking and dragging.

- Click once on the envelope display to insert the selected shape with its predefined length.  
If **Sync to Host** is activated, the shape is inserted at the nearest grid position. If you repeatedly click at the same position, the shape is inserted multiple times.
- Click and drag to insert the shape in the covered drag area. If **Sync to Host** is activated, the start and the end nodes of the shape snap to the grid, and all nodes in between are scaled relative to the overall length of the shape.  
After the shape is inserted, all nodes remain selected. This allows you to switch back to the **Edit** tool for further editing of the shape.

With **Fixed Mode** activated, the inserted nodes replace all nodes that cover the current time range. With **Fixed Mode** deactivated, all consecutive nodes are moved to the right.

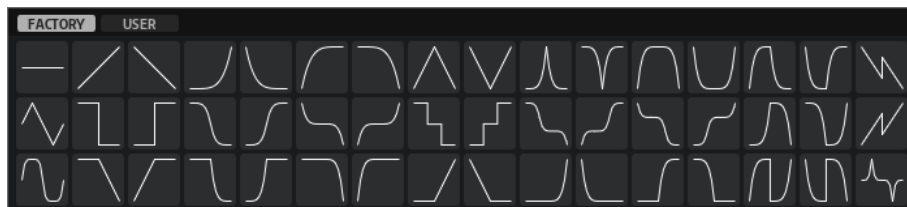
### Paint

Allows you to paint in a predefined envelope shape. The shape is inserted with its predefined length.

If **Sync to Host** is activated, the length is quantized to the grid. The level of the shape is determined by the vertical mouse position. This allows you to draw perfectly tempo-synchronized, sequential shapes with an added overall level progression.

### Select Shape

Allows you to select the shape that is used when entering nodes with the **Draw** or the **Paint** tool. A shape consists of multiple nodes making up a progression that can be used when creating your envelopes. The predefined factory shapes are available via the **Factory** tab. You can also create your own shapes and add them to the **User** tab. Up to 48 shapes are available per tab.



### Save Shape

Allows you to save the current envelope shape as a user shape. You can add up to 48 user shapes.

### Sync to Host Tempo

Allows you to synchronize the envelopes to the tempo of your host application.

### Grid

Allows you to set the grid for the envelope display, in note values.

### Fixed Mode

- With **Fixed Mode** activated, only the selected nodes are moved when you move a node on the time axis.
- With **Fixed Mode** deactivated, all subsequent nodes are moved as well when you move a node.

### Bipolar (Pitch and User envelopes only)

The **Amp** and **Filter** envelopes are unipolar. This means that their value range for the level is 0% to +100%, and you can enter positive values only. The **Pitch** and **User** envelopes are bipolar. Their value range for the level is -100% to +100%, which allows you to enter negative and positive values for these envelopes.

- With **Bipolar** activated, you can use both positive and negative values.
- With **Bipolar** deactivated, the envelope is unipolar and exclusively uses positive values.

### Snap to Guide Envelope

If **Snap to Guide Envelope** is activated and you change the position of nodes, they snap to the nodes of the guide envelope that is shown in the background.

#### NOTE

Pitch envelope nodes also snap to semitone positions.

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### Guide Envelope

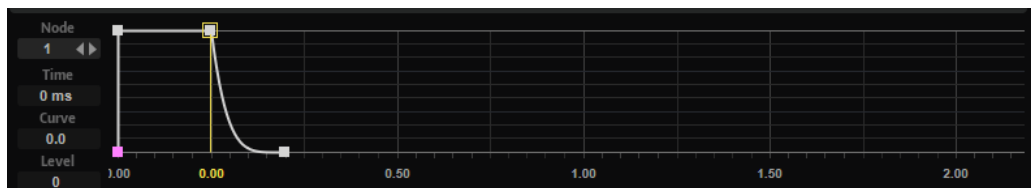
From this pop-up menu, you can select a second envelope to be displayed in the background of the edited envelope.

- If **Snap** is activated when you move nodes, they snap to the guide envelope.

### Show Sample Waveform

Shows the sample waveform in the background of the envelope display.

## Envelope Display



### Env Node

Displays the active envelope node. To select a node, enter its number in the field. To step through the nodes, use the **Previous Node/Next Node** buttons.

### Time

Specifies the period of time between two nodes. Depending on the **Sync** mode, the **Time** parameter is displayed in milliseconds and seconds, or in fractions of beats.

#### NOTE

The fraction is always reduced to the smallest possible value. 2/16 is displayed as 1/8, for example.

---

### Curve

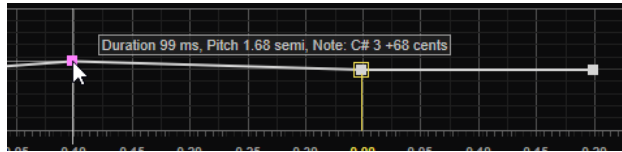
Allows you to adjust the curvature between two nodes from linear to logarithmic or exponential behavior.

### Level

Specifies the amplitude of the envelope at the position set by the **Time** parameter.

### Pitch Envelope Node Tooltips

In addition to the **Duration** and the **Pitch** for the current node, the value tooltip for pitch envelope nodes shows the MIDI note and the offset.



The value is affected by the following:

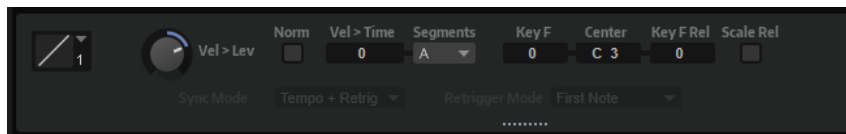
- The **Pitch Envelope Amount** parameter in the **Pitch** section.  
If this parameter is set to zero, the pitch is not affected by the pitch envelope, and the level of the node is shown instead.
- The root key of the zone.  
To obtain a reliable MIDI value, make sure that the **Root Key** parameter corresponds to the actual pitch of the sample.

#### NOTE

To show the root key in the **Zone Editor**, activate the **Show Zone Info Bar** button.

- The **Octave Tuning**, **Coarse Tuning**, and **Fine Tuning** parameters.  
For example, if **Root Key** is set to C3 and **Coarse** is set to +2, the tooltip for a pitch envelope node with a **Level** of 0 displays **D3**.

### Envelope Parameters



#### Level Velocity Curve

You can select the curve type to specify how the incoming velocity translates to the level of the envelope. The characteristics of each curve are displayed by a small icon.

#### Level Velocity

Determines how the velocity affects the level of the envelope.

The level of the envelope depends on two factors: the setting of this parameter and how hard you hit a key. With positive values, the harder you hit a key, the higher the level of the envelope. With negative values, the harder you hit a key, the lower the level of the envelope.

#### Use Normalized Velocity

Activate this option to use the normalized input velocity. This means that the velocity range to which the zone is mapped is transformed to the full velocity range between 0 and 127.

---

#### EXAMPLE

If a sample zone is mapped to a velocity range between 30 and 60 and you activate **Use Normalized Velocity**, an input velocity of 30 results in an output velocity of 0, and an input velocity of 60 results in an output velocity of 127, spanning the entire velocity range. This is useful to modulate filters, in order to smoothen the transitions between velocity-mapped sample zones, for example.

---

### Time Velocity

Adjusts the influence of velocity on the phases of the envelope. Positive values decrease the length of the phases for higher velocity values. Negative values increase the length of the phases for higher velocity values.

### Segments Affected by Time Velocity

Allows you to select the phases of the envelope to be affected by the **Time Velocity** parameter.

- **Attack** – The velocity affects the attack only.
- **Attack + Decay** – The velocity affects all phases up to the sustain phase.
- **Decay** – The velocity affects all phases including the sustain phase, but without the attack.
- **Attack + Release** – The velocity affects the attack and the release phases.
- **All** – The velocity affects all phases.

### Time Key Follow, Center Key, and KeyF Rel (Key Follow Release)

With the **Time Key Follow** and **KeyF Rel** parameters, you can scale the envelope phases across the keyboard.

- **Time Key Follow** scales all times before the sustain node.
- **KeyF Rel** scales all times after the sustain node, that is, the release phase of the envelope.

The value that you specify for **Center Key** is used as the central position for the **Time Key Follow** and **KeyF Rel** functions.

The envelope phases depend on the keyboard range in which the note is played and on the corresponding **Time Key Follow** setting:

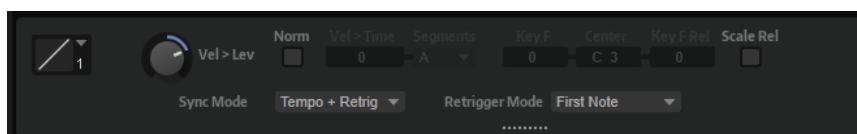
- Positive values decrease the phase lengths for notes above and increase the phase lengths for notes below the **Center Key**, that is, the higher the notes you play, the faster the envelope.
- Negative values increase the phase lengths for notes above and decrease the phase lengths for notes below the **Center Key**, that is, the higher the notes you play, the slower the envelope.

### Scale Rel (Scale Levels of Release Nodes with Level at Note-Off)

Allows you to scale the level of the release node with the level at note-off. This avoids abrupt changes in level as the envelope passes from one phase to the next, for example, from sustain to release.

#### NOTE

The level of the sustain node is automatically scaled in this way.



### Shaper Sync Mode

- With **Tempo + Retrig** selected, the entire length of the envelope is scaled with the host tempo and can be retriggered, depending on the selected **Retrigger Mode**.
- With **Tempo + Beat** selected, the entire length of the envelope is scaled with the host tempo. The envelope restarts with the transport of the host application and

lines up to temporal positions in the project. In this mode, the **Retrigger Mode** is not available.

- **NOTE**

This parameter is only available with **Sync to Host Tempo** activated.

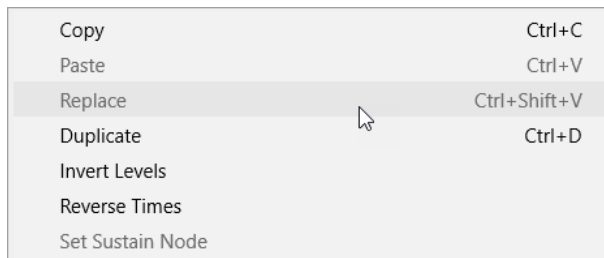
---

### Shaper Retrigger Mode

Determines whether the envelope is restarted when a note is triggered. The envelope restarts either immediately (**Tempo + Retrig**) or lines up with the project position (**Tempo + Beat**).

- With **Off** selected, the envelope is not retriggered and runs freely.
- With **First Note** selected, the envelope restarts when a note is triggered and no other notes are held.
- With **Each Note** selected, the envelope restarts each time that a note is triggered.

### Envelope Display Context Menu



The upper part of the context menu allows you to edit the envelope nodes.

#### Copy

Copies the selected nodes.

#### Paste

Pastes the copied nodes to the insert position.

#### Replace

Replaces the selected nodes with the nodes from the clipboard.

#### Duplicate

Duplicates the selected nodes.

#### Invert Levels

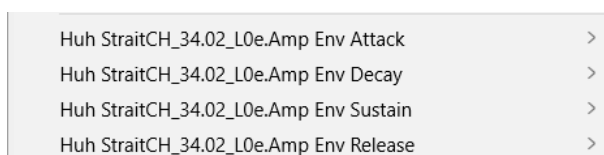
Flips the **Time** values of the nodes around the vertical center of the selection.

#### Reverse Times

Flips the nodes around the horizontal center of the selection.

#### Set Sustain Node

Allows you to make the selected node the sustain node.



Via the lower part of the context menu, you can assign automation or quick controls to the **Attack**, **Decay**, **Sustain**, and **Release** segments of the envelope. This allows you to modify the

segments using the envelope controls on the macro page of an instrument, such as Anima or Trium.

### Envelope Attack

Allows you to scale the first envelope segment. The control range is from 0 (1/30,000) to 1 (30,000). This means that you can stretch/lengthen an attack time of 1 ms to a length of 30 s, and you can shorten/reduce an attack time of 30 s to a length of 1 ms.

### Envelope Decay

Allows you to scale all segments after the first node, up to the sustain node. The control range is from 0 (1/100) to 1 (100). This means that a decay time of 5 seconds can be reduced to 50 ms and lengthened to 500 s, for example.

### Envelope Sustain

Allows you to scale the sustain level. The range starts at 0 and ends at the sustain level set for the envelope.

### Envelope Release

Allows you to scale all segments after the sustain node. The control range is from 0 (1/100) to 1 (100).

These parameters allow you to create complex envelope curves and to modify them using your **A**, **D**, **S**, and **R** envelope controls on the macro page.

#### RELATED LINKS

[Scaling the Level of the Release Node with the Level at Note-Off](#) on page 195  
[Node Editing](#) on page 192

## Selecting Nodes

---

#### CHOICES

- To select a node, click on it in the graphical editor.  
The focused node is indicated by a frame. The value fields above the graphical envelope editor display the parameters of the focused node.
  - If multiple nodes are selected, you can use the **Selected Envelope Node** value field to set the focus to a different node without losing the current selection.
  - To add a node to a selection, **Shift**-click the node. Selected nodes are edited together.
  - You can select multiple nodes by drawing a rectangle around the nodes with the mouse.
  - To select all envelope nodes, press **Ctrl/Cmd - A**.
  - If the graphical editor has the focus, you can select the next or the previous node with the **Left Arrow** and **Right Arrow** keys.
  - If multiple nodes are selected and the **Edit** tool is active, the multi-selection rectangle is shown, allowing for further editing functions.
- 

#### RELATED LINKS

[Node Editing](#) on page 192

## Node Editing

You can edit single nodes or multiple selected nodes.

- To add a node, double-click on the envelope curve.
- You can also add nodes by copying and pasting selected nodes.

When you press **Ctrl/Cmd**, the insert position is indicated by a line. With **Sync to Host Tempo** activated, this insert line is aligned to the note value grid.

**NOTE**

An envelope can consist of up to 512 nodes. If more nodes are copied to the clipboard than can be pasted into the envelope, a warning indicator lights up.

- To delete a node, double-click it, or click it with the **Erase** tool.

**NOTE**

- You cannot remove the first, the last, or the sustain node.
  - All nodes added after the sustain node affect the release phase of the envelope.
- 
- To delete several nodes, drag a selection rectangle around them with the **Erase** tool. With **Fixed Mode** activated, the positions of the remaining nodes are not modified. The **Time** value of the node to the right of the deleted selection is automatically adjusted. With **Fixed Mode** deactivated, the remaining nodes are moved to the left to fill the gap.
  - To change the curvature between two nodes, drag the curve segment up or down, or enter a new value in the **Curve** field. Positive values change the curvature towards logarithmic, and negative values towards exponential behavior. To reset a curve to linear, **Ctrl/Cmd**-click it.
  - To move a node, drag it sideways, or enter a new value in the **Time** field. For a higher resolution, hold **Shift** while moving the nodes. To limit the movement to the time axis, that is, to change only the horizontal position of a node, hold down **Ctrl/Cmd** while dragging.
  - To change the level of a node, drag it up or down, or enter a new value in the **Level** field. For a higher resolution, hold **Shift** while moving the nodes. To limit the movement to the level axis, that is, to change only the vertical position of a node, hold down **Alt/Opt** while dragging.

## Replacing Node Selections

You can replace a selection of nodes with nodes copied to the clipboard or with one of the predefined shapes on the shape selector.

- To replace multiple nodes with a predefined curve, select the nodes, and select the curve from the shape selector. The shape is stretched/compressed to replace the exact time range of the selection.
- To replace multiple nodes with a selection of nodes from the clipboard, select the nodes that you want to replace, open the context menu, and select **Replace**. The copied nodes are stretched/compressed to replace the exact time range of the selection.

## Multi Selection Editing with the Edit Tool

With multiple envelope nodes selected and with the **Edit** tool active, a multi-selection rectangle is shown in the envelope display. It has six handles that allow you to modify the selected nodes.



- To compress the node levels, drag the right or left middle handle down.
- To expand the node levels, drag the right or left middle handle up.
- To tilt the left part of the node selection upwards or downwards, drag the upper left handle. To use a shelving curve instead of a linear curve, press **Ctrl/Cmd**.
- To tilt the right part of the node selection upwards or downwards, drag the upper right handle. To use a shelving curve instead of a linear curve, press **Ctrl/Cmd**.
- To scale the node levels, drag the upper middle handle. To offset all nodes, press **Shift**. To use a bell curve instead of a linear curve, press **Ctrl/Cmd**.
- To scale the overall time of the selected nodes relative to the start node, drag the lower right handle.
- To scale the overall time of the selected nodes relative to the start node, drag the lower left handle.
- To move the time position of all selected nodes, drag the lower middle handle to the left or right. To move the nodes in smaller steps, press **Shift**.
- To compress or expand the overall time of the selected nodes relative to the selection center, press **Ctrl/Cmd**, and drag the lower middle handle.
- To change the level and position of all selected nodes, drag one of the nodes.

## Zooming

The vertical axis of the graphical envelope editor displays the level. The horizontal axis displays the time.

---

### CHOICES

- To zoom in or out, click the + or - buttons to the right of the scrollbar below the graphical editor.
  - To zoom in or out at the current position, click in the timeline, and drag up or down.
  - To toggle between full zoom and the previous zoom setting, click the **A** button to the right of the horizontal zoom slider.
  - To zoom to a specific region, hold **Alt/Opt**, click and drag the mouse over the region.
- 

## Using Zoom Snapshots

Zoom snapshots save the zoom factor and the scroll position of the editor. These are restored when you load the snapshot.

To the right of the scrollbar, you can find three numbered buttons that allow you to save and load zoom snapshots.



NOTE

If you perform any manual zooming or scrolling, the zoom snapshot is deactivated.

---

PROCEDURE

1. To save the current state of the editor as a snapshot, **Shift**-click one of the numbered buttons to the right of the scrollbar.
  2. To load a zoom snapshot, click the corresponding button. The button color changes if a snapshot is active.
- 

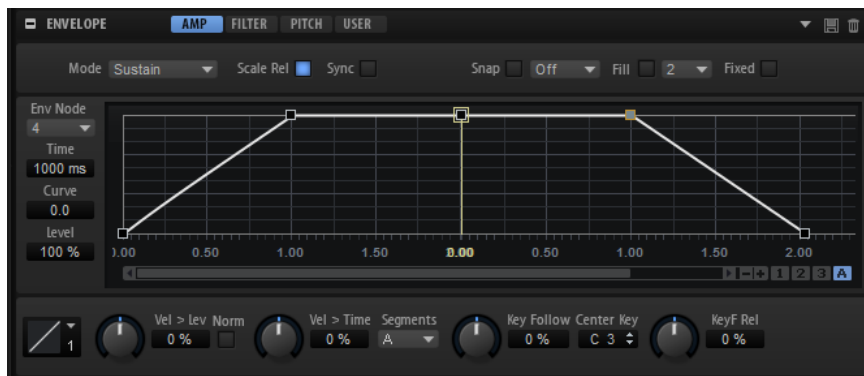
## Scaling the Level of the Release Node with the Level at Note-Off

With the **Scale Rel** parameter, you can automatically set the level of the release node to the note-off level.

---

PROCEDURE

1. Set up an amplifier envelope with five nodes, spaced at intervals of 1000 ms. The second, third, and fourth nodes have a level of 100%. All curve segments are linear.




2. Deactivate **Scale Rel**, and play and release a note in the middle of the attack, halfway between node 1 and 2.  
The level of node 4 is not altered. However, the sustain level is scaled down and therefore increases when proceeding from the sustain node to node 4.
  3. Activate **Scale Rel** and play and release a note in the middle of the attack, halfway between node 1 and 2.  
The level of node 4 is scaled down by the level at note-off. In this example, the sustain level and the level of node 4 are exactly the same. They have been scaled by the same amount, and the level does not change when proceeding from the sustain node to node 4.
- 

## Synchronizing Envelopes to the Host Application

You can synchronize the envelopes to the tempo of your host application. This allows you to set envelope times that relate to musical time intervals, regardless of any tempo changes.

---

PROCEDURE

1. Activate **Sync to Host Tempo**  to activate sync mode for the envelope.  
A grid spaced in fractions of beats is displayed in the graphical envelope editor.

2. From the pop-up menu located to the right of the **Sync** button, select a note value. You can also select triplet or dotted note values.

This sets the resolution of the grid.

**NOTE**

- Envelope nodes that do not exactly match a note value display the closest note value.
- Nodes that match a note value exactly are indicated by a red dot inside the handle of the node. This is useful if you switch the grid between triplets and normal note values, for example. The triplet nodes still indicate that they match a note value, even if the grid shows normal note values.

3. You can also enter note values and triplets manually in the value field.

**NOTE**

The **Time** field of a node displays times in fractions of beats. The fraction is always reduced to the smallest possible value. 2/16 is displayed as 1/8, for example.

---

## Setting Up the Loop

You can set up the envelope to repeat its playback between the selected nodes.

**PROCEDURE**

1. Set the envelope mode to **Loop**.
  2. The loop is indicated by the green region in the graphical envelope editor. Specify the loop start and end by dragging the borders of the region.  
The loop region can only be set up in the decay phase of the envelope.
- 

## LFO Section

Synth, sample, grain, FM, spectral, and wavetable zones offer two polyphonic LFOs and an X-LFO.

Polyphonic means the LFOs are calculated per voice, allowing for independent modulations with each triggered note. You can use this to create a richer sound, for example, with an independent pitch modulation per note. The LFOs can be assigned freely in the modulation matrix, and they have an additional envelope that allows you to shape the modulation intensity over time.

X-LFO provides two LFOs combined into a single unit. It can be used to modulate two-dimensional XY parameters, for example.

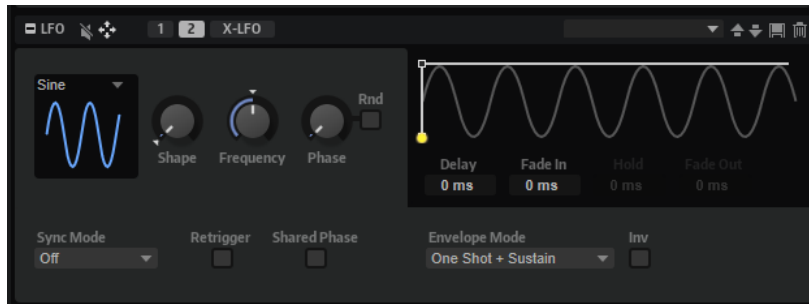
You can also configure monophonic LFOs using the Mono LFO MIDI Module.

**RELATED LINKS**

[Mono LFO on page 649](#)

## LFO 1 and LFO 2

To access the LFOs, click the corresponding button at the top of the LFO section.



### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Frequency

Controls the frequency of the modulation, that is, the speed of the LFO.

### Phase

Sets the initial phase of the waveform when the LFO is retriggered.

### Rnd (Random Phase)

If this button is activated, each note starts with a randomized start phase.

#### NOTE

The **Phase** control cannot be used if **Rnd** is activated.

### Sync Mode

**Sync Mode** is used to synchronize the LFO to the tempo of the host application.

- Select **Off** to adjust the speed of the modulation in Hertz.

- Select **Tempo + Retrig** to adjust the speed of the modulation in fractions of beats. You can also set dotted and triplet note values. The restart behavior of the LFO depends on the **Retrigger Mode**.
- Select **Tempo + Beat** to adjust the speed of the modulation in fractions of beats. You can also set dotted and triplet note values. The LFO restarts with the transport of the host and lines up to the beats of the project. The **Retrigger Mode** setting is not taken into account.

#### NOTE

The behavior of the **Frequency** parameter changes with the selected option.

---

### Retrigger

Determines whether the LFO is restarted when a note is triggered. The waveform restarts at the position set with the **Phase** parameter.

- If this button is activated, the LFO starts with each triggered note.
- If this button is deactivated, the LFO runs freely.

### Shared Phase

If **Shared Phase** is activated, each voice generates its own LFO signal, but the phases are synchronized, which means that the polyphonic LFO acts like a monophonic LFO.

#### TIP

If you want legato-played notes to use the phase of the first note, use **Shared Phase** in combination with **Retrigger**.

---

### Envelope display

You can adjust the times of the envelope in the graphical editor by dragging nodes to the left or to the right.

- The first node adjusts the **Delay** time.
- The second node adjusts the **Fade In** time.
- The third node adjusts the **Hold** time.
- The fourth node adjusts the **Fade Out** time.

#### NOTE

Which nodes are available in the graphical editor depends on the **Envelope Mode** setting.

---

### Delay

Determines the delay time between the moment you play a note and the moment the LFO takes effect.

### Fade In

Determines the time it takes for the LFO to fade in after the note was triggered and the **Delay** time has elapsed.

### Hold

Determines the amount of time the LFO is running before the fade out begins.

#### NOTE

**Hold** is only available for the envelope modes **One Shot** and **Hold + Fade Out**.

---

### Fade Out

Determines the time it takes for the LFO to fade out after the **Hold** time has elapsed or a note has been released.

#### NOTE

To deactivate the fade out, use the envelope modes **One Shot + Sustain** or **Sustain**. This ensures that the modulation does not change when a note is released.

### Envelope Mode

Allows you to specify how the LFO envelope reacts to your playing on the keyboard. The **One Shot** modes do not react to note-off events.

- Select **One Shot** to play the envelope from start to end in the time specified by the **Delay**, **Fade In**, **Hold**, and **Fade Out** parameters.
- **One Shot + Sustain** is similar to **One Shot**. The **Delay** and **Fade In** parameters are always applied when you play a note. The **Hold** and **Fade Out** parameters are not available.
- If **Hold + Fade Out** is selected and you play a note, the **Delay** and **Fade In** parameters are applied. The envelope fades out after the time specified by the **Hold** parameter or when a key is released. Releasing a key during the fade in starts the fade out from the current level.
- If **Sustain + Fade Out** is selected and you play a note, the **Delay** and **Fade In** parameters are applied. The **Hold** parameter is not available. The fade out is applied when releasing the key. Releasing a key during the fade in starts the fade out from the current level.
- If **Sustain** is selected and you play a note, the **Delay** and **Fade In** parameters are applied. The **Hold** and **Fade Out** parameters are not available. Releasing a key during the fade in sustains the current level. This prevents a change in modulation when a key is released.

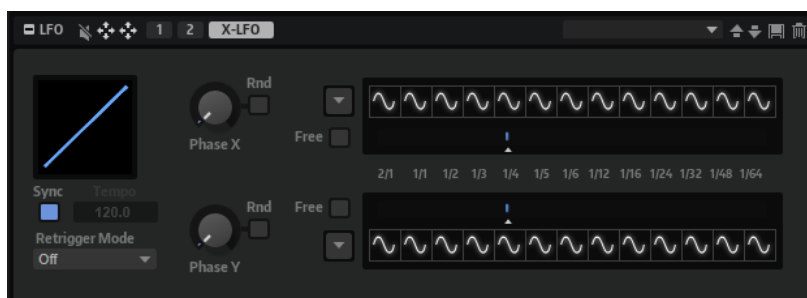
### Inv (Invert Envelope)

If this parameter is activated, the behavior of the LFO envelope is inverted, that is, the LFO modulation starts at its maximum level and decreases to zero in the time specified by the **Fade In** parameter. After the **Hold** time has elapsed, or when the key is released, the modulation increases to its maximum level in the time specified by the **Fade Out** parameter.

## X-LFO

X-LFO provides two LFOs combined into a single unit. It can be used to modulate two-dimensional XY parameters, where one LFO modulates the x-value and the other LFO the y-value, for example.

Both LFOs can be configured individually and provide a **Rate** parameter that can be modulated.



### Phase display

The display on the left visualizes the current phase.

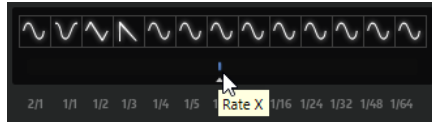
### Phase X/Phase Y

Sets the initial phase of the waveform when the LFO is retriggered.

### Random Phase

If this button is activated, the initial phase is set randomly.

### Rate X/Rate Y



Sets the rate for the X-LFO.

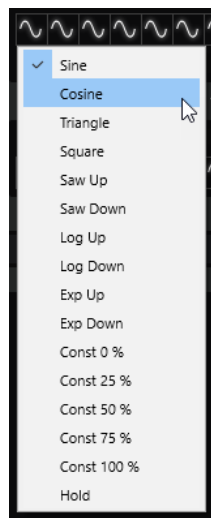
### Waveform

The buttons above the 13 **Rate** steps allow you to select their waveforms. You can assign 13 different waveforms, which means that changing the speed of the LFO can also change the waveform.

**Const** values send a constant output value.

**Hold** keeps the last value until the LFO switches to the next waveform.

- To select a waveform, click the **Waveform** button for the corresponding **Rate** step, and select the waveform from the menu.



- To set a waveform for all **Rate** steps at the same time, click on the **Set All Waveforms** button to the left of the waveform buttons, and select it from the pop-up menu.

### Free

Allows you to use the LFO with a continuously adjustable speed.

#### NOTE

Even with **Free** speed activated, the rate range is still divided into 13 steps that switch between waveforms.

---

### Sync

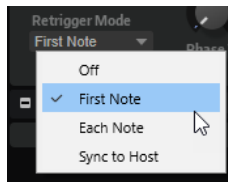
Activate **Sync** to synchronize the LFO to the host tempo.

## Tempo

If **Sync** is deactivated, you can enter the reference tempo in the **Tempo** field.

## Retrigger Mode

Determines whether the LFO phase is restarted.

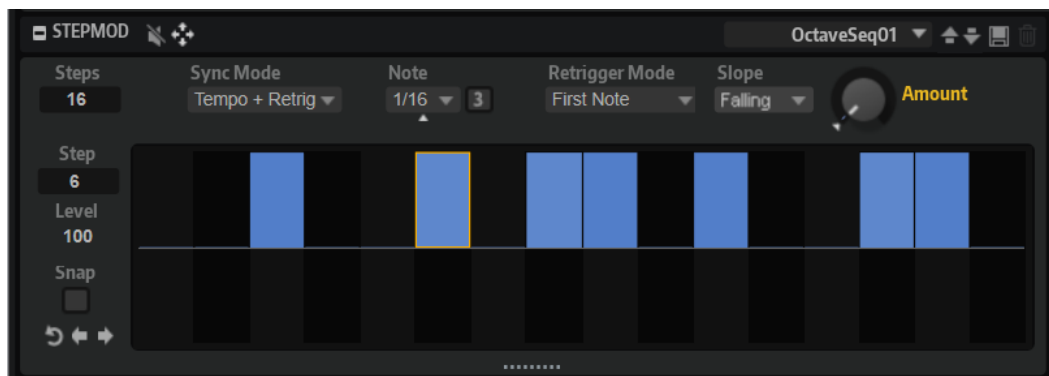


- If this parameter is set to **Off**, the LFO phase is not restarted.
- If **First Note** is selected, the LFO phase restarts when a note is triggered and no other notes are held.  
If **Each Note** is selected, the LFO phase restarts each time that a note is triggered.
- If **Sync to Host** is selected, the phase is synchronized to the locator position in the host application.

# Step Modulator

Synth, sample, grain, and wavetable zones feature a polyphonic step modulator for creating rhythmic control sequences.

The step modulator can be freely assigned in the modulation matrix.



## Steps

Sets the number of steps in the sequence. The maximum number of steps is 32.

## Sync Mode

- **Off** allows you to adjust the speed at which the sequence repeats.  
Whether the sequence restarts when you play a note depends on the **Retrigger Mode**.
- **Tempo + Retrig** allows you to adjust the length of the steps in fractions of beats. The speed of the modulation depends on the number of steps, the note value, and the tempo you set in your host application. To use triplet note values, activate **Triplet**.  
Whether the sequence restarts when you play a note, depends on the selected **Retrigger Mode**.
- **Tempo + Beat** allows you to adjust the length of the steps in fractions of beats. The speed of the modulation depends on the number of steps, the note value,

and the tempo you set in your host application. To use triplet note values, activate **Triplet**.

The sequence restarts with the transport of the host application and lines up to the beats of the project. **Retrigger Mode** is not taken into account.

### Frequency

If **Sync Mode** is set to **Off**, this controls the speed at which the sequence is repeated.

### Note

If **Sync Mode** is set to one of the **Tempo** settings, this adjusts the length of the steps in fractions of beats. You can also select triplet values.

### Triplets

Activate this button to use triplet note values.

### Retrigger Mode

Determines whether the sequence restarts when you play a note. This parameter is only available if **Sync Mode** is set to **Off** or **Tempo + Retrig**.

- If this parameter is set to **Off**, the sequence is not restarted. Instead, it resumes playback at the position where you released the key.
- If this parameter is set to **First Note**, the sequence restarts when a note is triggered and no other notes are held.
- If this parameter is set to **Each Note**, the sequence restarts each time a note is triggered.

### Slope

Determines whether the step modulator jumps from step to step or creates ramps between the steps.

- **No Slope** produces hard steps.
- **Slope on Rising Edges** creates ramps for rising edges only.
- **Slope on Falling Edges** creates ramps for falling edges only.
- **Slope on All Edges** creates ramps for all edges.

### Amount

If **Slope** is set to **Slope on Rising Edges**, **Slope on Falling Edges**, or **Slope on All Edges**, this parameter determines the time of the ramp between two steps. The higher the setting, the smoother the transitions between steps.

### Step

Allows you to select a specific step.

### Level

Shows the level of the selected step.

### Snap

If **Snap** is activated, the level of each step can only be adjusted in steps of 1/12th.

### Shift Pattern Right/Shift Pattern Left

Shift all the steps to the right/left. If you shift the pattern to the left, the first step is moved to the end. If you shift the pattern to the right, the last step is moved to the beginning.

### Reverse Pattern

Reverses the pattern, that is, inverts the order of all steps.



## Editing Steps

You can adjust the steps separately, but you can also use modifier keys to enter or edit multiple steps simultaneously.

- To set the level of a step, click at the corresponding position in the graphical editor.
- To change the value of a step, drag the step up or down, or enter a new value in the **Level** value field.
- To reset the level of a step to 0%, **Ctrl/Cmd**-click the step.
- To reset all steps, hold **Shift - Ctrl/Cmd**, and click in the graphical editor.
- To adjust all steps at the same time, **Shift**-click, and drag a step.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift - Alt/Opt**, and draw a line.
- To gradually raise or lower the value of the selected step, use the **Up Arrow** and **Down Arrow** keys.  
By default, the value changes in increments of 1%. Hold **Shift** to use increments of 0.1% instead.
- If the graphical editor has the keyboard focus, you can use the left and right arrow keys to select the previous or the next step.

## Producing Modulations in Steps of Semitones

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### PROCEDURE

1. Activate **Snap**.
  2. In the modulation matrix, assign the **Step Modulator** to **Pitch**.
  3. Set the **Modulation Depth** to +12.  
Now, the levels of the steps represent semitone intervals.
  4. In the **Step Modulator**, adjust each step to the interval that you want to use.
- 

## Modulation

The concept of controlling one parameter by another one is called modulation. HALion offers many fixed assigned modulations, such as the amplitude and filter envelopes, or pitch key follow.

Modulation assignments can be set up in the modulation matrix or using the modulation assignment rows in the **Zone Editor**.

In the **Zone Editor**, parameters that can be modulated are indicated by a small white triangle. If a modulation source is assigned to a parameter, the triangle of this parameter turns orange.



### RELATED LINKS

- [Modulation Rows in the Zone Editor](#) on page 204
- [Modulation Matrix](#) on page 205

## Modulation Rows in the Zone Editor

For each source and each destination, modulation rows are available below the corresponding sections in the **Zone Editor**. These rows show the current modulation assignments.

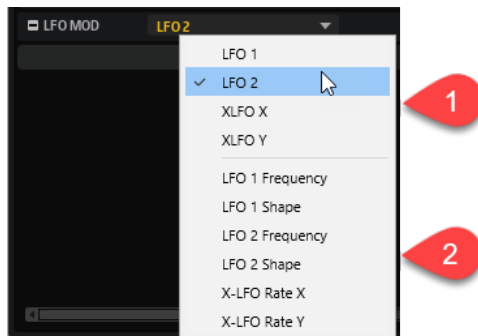
If a source or destination section contains different tabs, the modulation section shows the assignments for the selected tab.

### Sources

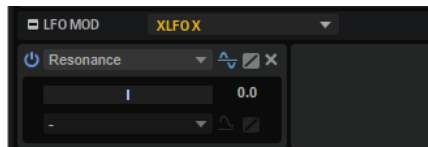
**Envelope**, **LFO**, and **Step Modulator** can act as modulation sources.

In the header of the modulation section, you find a pop-up menu. This menu has two functions:

- 1 If a section offers multiple sources, such as the **Envelope** and **LFO** sections, you can select a source to show its assignments.
- 2 If a source has parameters that can be addressed as modulation destinations, these are listed below the modulation sources, and you can select a parameter to show its assignments.



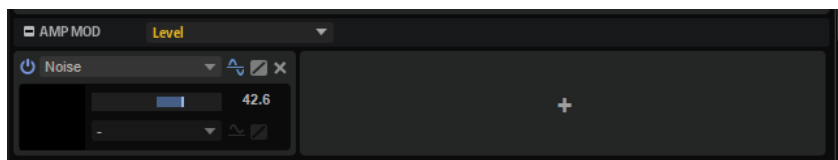
When a source is selected, its modulation row is shown.



You can jump to the assignment row of a modulated parameter by clicking on it in the source edit section. To go back to the assignment row of the source, click on the background of the edit section.

### Destinations

**Pitch**, **Osc**, **Filter**, and **Amp** can act as modulation destinations.



#### Select Modulation Destination

Allows you to specify the modulation destination. All available destinations are listed.

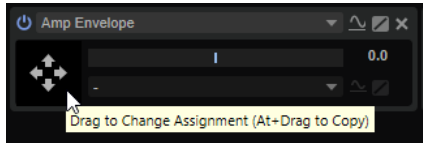
For example, for the **Pitch** section, the **Pitch** parameter is available. For the **Oscillator** sections, you can choose from different oscillators and oscillator parameters.

### Add Modulation

Once you have selected a modulation destination, the **Add Modulation** button becomes available. Click it to select a modulation source, and make further settings.

### Change Assignment Drag Icon

If you move the mouse over the field on the left, a drag icon appears, allowing you to change the modulation assignment. Click and drag the icon onto the parameter that you want to use as the new modulation destination.



If a section is hidden, you can drag the icon onto the corresponding section button to make it visible and then drag the icon onto a parameter to assign it.

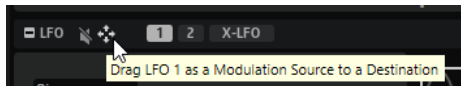
#### RELATED LINKS

[Modulation Parameters](#) on page 208

## Creating Modulations Using Drag and Drop

In the **Zone Editor**, you can create modulations by dragging a modulation source onto a destination.

Modulation sources have a modulation drag icon in the section header.



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#### PROCEDURE

- Drag the modulation drag icon of the source that you want to use onto the parameter control that you want to modulate.  
When you start dragging, the label color of all available destination parameter controls changes to green, so that they can quickly be identified. If you want to drag a source to a parameter located in a hidden section, drag the icon onto the section button at the top to make the section visible and to gain access to its parameters.

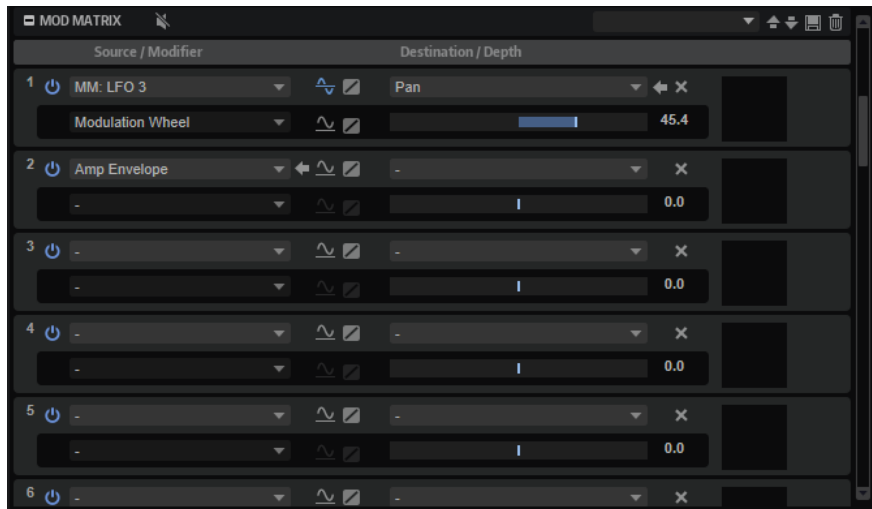
---

#### RESULT

The modulation assignment is created. The label color of the parameter turns orange to indicate that the parameter is modulated. The new modulation assignment is added to the modulation rows of the source and the destination sections, and to the modulation matrix.

## Modulation Matrix

In the modulation matrix, you can interconnect modulation sources, such as LFOs and envelopes, with modulation destinations, such as pitch, cutoff, amplitude, etc.



The modulation matrix offers you up to 32 freely assignable modulations, each with a source, an offset parameter, a modifier, and a destination with adjustable depth. All modulation sources and destinations can be assigned several times. The polarity of each source can be switched between unipolar and bipolar. An additional modifier and user-definable curves and ranges give you further control over the modulation.

In the **Source/Modifier** section, you can set up a modulation source and a modulation modifier. In the **Destination/Depth** section, you can select a modulation destination and specify the modulation depth. The meter on the right shows the modulation signal.

#### RELATED LINKS

[Modulation Curve and Range](#) on page 209

## Creating Modulations in the Modulation Matrix

In the modulation matrix, you create modulation assignments by selecting modulation sources, modifiers, and destinations from the pop-up menus.

#### PREREQUISITE

You have selected the zone that you want to edit.

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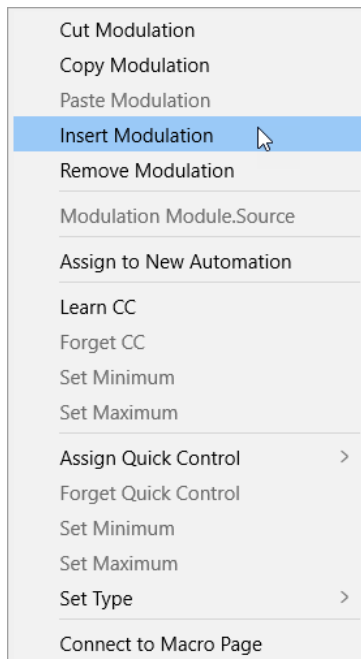
#### PROCEDURE

1. In the **Zone Editor**, open the **Modulation Matrix** section.
  2. Select a modulation source and a modulation destination, for example, **LFO1** as the source and **Pitch** as the destination.
  3. Use the horizontal fader to adjust the modulation depth.
  4. Optional: Click the **Source 2** field, and select a modifier or change the polarity of the source. For example, select **Pitch Bend** as the modifier, and set it to unipolar.
  5. Optional: Use the curve and range settings on the right to limit the modulation range or to adjust the characteristics of the modulation.
  6. Optional: Click **Edit Source 1** or **Edit Source 2** to open the curve and range settings, and limit the modulation range or adjust the characteristics of the modulation.
- 

#### RELATED LINKS

[Modulation Curve and Range](#) on page 209

## Modulation Matrix Context Menu



### Cut Modulation

Cuts the modulation data from the current slot.

### Copy Modulation

Copies the modulation data from the current slot to the clipboard.

### Paste Modulation

Pastes the modulation data from the clipboard to the current modulation slot.

#### NOTE

You can copy and paste modulation rows between different programs and between different plug-in instances.

### Insert Modulation

Inserts an empty modulation slot.

### Remove Modulation

Removes the modulation slot.

### Name of the Assigned Source/Modulator/Destination

Depending on where you click, the assigned modulation source, the modulator, or the modulation destination is shown on the context menu.

### Assign to New Automation

Assigns this modulation source as an automation parameter.

### Learn CC

Allows you to assign a MIDI controller to the modulation slot.

### Forget CC

Removes the MIDI controller assignment from the current slot.

### **Set Minimum**

Allows you to set the minimum value for the MIDI controller that is assigned to the modulation slot.

### **Set Maximum**

Allows you to set the maximum value for the MIDI controller that is assigned to the modulation slot.

### **Assign Quick Control**

Allows you to assign a quick control to the modulation slot.

### **Forget Quick Control**

Removes the quick control assignment of the modulation slot.

### **Set Minimum**

Allows you to set the minimum value for the quick control that is assigned to the modulation slot.

### **Set Maximum**

Allows you to set the maximum value for the quick control that is assigned to the modulation slot.

### **Set Type**

- **Absolute** remote-controls the parameter values continuously. Absolute mode changes the assigned parameters by overwriting them with the current quick control value, that is, parameter changes are overwritten.
- **Relative** remote-controls the parameter values continuously. Relative mode changes the values of the assigned parameters without losing their relative settings, that is, parameter changes can still be heard.
- **Switch Absolute** switches between the minimum and maximum value. Parameter changes are overwritten.
- **Switch Relative** switches between the minimum and maximum value. Parameter changes can still be heard.

### **Connect to Macro Page**

Allows you to connect a parameter to a macro page – if the layer uses a macro page. After selecting **Connect to Macro Page**, open the macro page, right-click the control, and select **Connect to Parameter <HALion parameter name>**.

#### RELATED LINKS

[Setting Up Automation](#) on page 52

## **Modulation Parameters**

The modulation parameters in the modulations sections and the modulation matrix are identical.

### **Global Parameters**

#### **Bypass Modulation**

Allows you to bypass the modulation slot to check its influence on the sound.

#### **Delete Modulation**

Deletes the modulation row.

## Source Parameters

### Source 1

Shows the modulation source. Click in the field to select a new source. When you position the mouse pointer over the **Source 1** field, the **Jump to Source** button is shown. Click this button to jump to the edit section of the modulation source.

### Source 2

Shows the modulation modifier, a secondary modulation source that manipulates the outgoing modulation signal. For example, you can assign the mod wheel to control the intensity of the modulation. Click in the field to select a new modifier. When you position the mouse pointer over the **Source 2** field, the **Jump to Source** button is shown. Click this button to jump to the edit section of the modulation modifier.

#### NOTE

- Jumping to **Source 2** is only possible if this source has a dedicated edit section. For example, for **Key Follow**, **Aftertouch**, **MIDI Controller**, etc., **Jump to Source** is not available.
- When you jump to **Source 2**, source 1 and 2 change their roles. As a consequence, Source 1 becomes Source 2, and vice versa. This is indicated by a "1" label in front of the source control.

### Polarity: Unipolar/Bipolar

Allows you to set the polarity of a modulation source. The polarity specifies the value range. Unipolar sources modulate between 0 and +1. Bipolar sources modulate between -1 and +1.

This allows you to change the polarity of the **Amp** or **Filter** envelopes from unipolar to bipolar, to map their range to a bipolar parameter, such as **Pan**, for example. However, the envelopes always display their values with their default polarity.

### Edit Source 1/Edit Source 2

These buttons open a panel where you can set up a curve and range for each modulation source.

## Destination Parameters

### Destination

Shows the destination parameter. Click in the field to select a new destination. When you position the mouse pointer over the **Destination** field, the **Jump to Destination** button is shown. Click this button to jump to the edit section of the destination.

### Modulation Depth

Adjusts the modulation depth, that is, the intensity of the modulation.

#### RELATED LINKS

[Modulation Curve and Range](#) on page 209

## Modulation Curve and Range

You can set up the curve and range of each modulation source (**Source 1**) and modulation modifier (**Source 2**). This allows you to change the characteristics of a modulation.

To open the panel where you can set up the curve, click **Edit Source 1** or **Edit Source 2** in a modulation row for a modulation section in the **Zone Editor** or in the modulation matrix.



### Curve Shape

In the display at the top, the curve shape is shown. The displayed curve is superimposed on the modulation source. This way, you can change the modulation from linear to exponential or logarithmic, for example.

To select another shape, click the corresponding button on the right.

To create your own user curve, select **Custom Curve** .

You can edit the custom curve in the following way:

- To insert a new node, double-click in the editor.
- To delete a node, double-click it.
- To adjust the basic shape of the curve, drag the nodes to new positions.
- To change the curvature, drag the lines between the nodes up or down.

### Minimum Output Value/Maximum Output Value

These values allow you to limit the modulation to a specific range only.

Incoming values below the **Minimum Output Level** are raised to this level before they progress along the selected curve to the **Maximum Output Value**.

### Input Value Offset

Allows you to offset the incoming values by a fixed amount. For example, with a value of 100, only the second half of the curve is superimposed on the modulation.

### Range

**Range** allows you to limit the range that is modulated.

## Modulation Sources

You set up the modulation source via the **Source 1** pop-up menu.

The following sources are available:

### LFO 1/2

The LFOs 1 and 2 produce cyclic modulation signals.

These LFOs are polyphonic, that is, a new LFO signal is created with each new note.

### Amp Envelope

The amplifier envelope. This modulation source is unipolar. The shape of the envelope determines the modulation signal.

### Filter Envelope

The filter envelope. The shape of the envelope determines the modulation signal.



### **Pitch Envelope**

The pitch envelope. This modulation source can be unipolar or bipolar, depending on the setting of the **Bipolar** parameter in the **Envelope** section. The shape of the envelope determines the modulation signal.

### **User Envelope**

The user envelope. This modulation source can be unipolar or bipolar, depending on the setting of the **Bipolar** parameter in the **Envelope** section. The shape of the envelope determines the modulation signal.

### **Step Modulator**

The step modulator of the zone. This modulation source is bipolar. It produces cyclic, rhythmically stepped modulation signals.

### **Glide**

The glide signal of the source. This modulation source is unipolar.

### **Key Follow**

This produces an exponential modulation signal derived from the MIDI note number. Exponential means this source works with destinations such as **Pitch** or **Cutoff**. This modulation source is bipolar.

### **Note-on Velocity**

Note-on velocity can be used as the modulation signal. This modulation source is unipolar.

### **Note-on Vel Squared**

The squared version of **Note-on Velocity**. The harder you press the key, the higher the modulation values.

### **Note-on Vel Normalized**

This modulation source transforms the velocity range specified in the mapping to the full range of 0 to 127.

### **Note-off Velocity**

Note-off velocity can be used as the modulation signal. This modulation source is unipolar. Most MIDI keyboards cannot send note-off velocity messages. However, most sequencer software is able to produce such messages.

### **Pitchbend**

The position of the pitchbend wheel can be used as the modulation signal. This modulation source is bipolar.

### **Modulation Wheel**

The position of the modulation wheel can be used as the modulation signal. This modulation source is unipolar.

### **Aftertouch**

Aftertouch can be used as the modulation signal. This modulation source is unipolar. Some MIDI keyboards cannot send aftertouch messages. However, most sequencer software is able to produce such messages.

### **MIDI Controller**

Any of the 127 available MIDI controllers can be used as the modulation signal. You can select the MIDI controller from the corresponding submenu.

In addition, you can select the eight global MIDI controllers **Contr. A-Contr. H** that can be used as placeholders in the modulation matrix. These controllers allow you to remap specific MIDI controllers to the placeholder controllers, for example, by using

the CC Mapper. This way, you can use the global controllers in several places, and set up the assignment only once.

### Quick Control

The quick controls of the program or layer to which the zone belongs can be used as the modulation signal. You can select quick control from the corresponding submenu.

### Note Expression

This submenu lists the eight Note Expression parameters that can be used as the modulation signals.

### MIDI Modules

This submenu lists the available MIDI modules that can be used as the modulation signals. A zone can use the MIDI modules that are higher up in the **Program Tree** hierarchy than the zone. Which parameters are available depends on the selected module.

### Noise

Produces a random modulation signal. This modulation source is bipolar.

### Output

The audio output of the zone can be used as the modulation signal. This modulation source is unipolar.

### Bus 1-16

Modulations that are sent to one of the 16 busses can be reused as sources. This way, you can combine several modulations to produce more complex signals.

### X-LFO X

The output signal of the first LFO in X-LFO can be used as the modulation signal.

### X-LFO Y

The output signal of the second LFO in X-LFO can be used as the modulation signal.

## Modulation Modifiers (Source 2)

All modulation sources can also be used as modifiers. A modifier is used to scale the output of the modulation source. A typical example is an LFO as a source and the modulation wheel as the modifier. This allows you to control the intensity of the LFO modulation via the wheel. You can find the modulation modifiers on the **Source 2** pop-up menu.

The **Sample & Hold** modifier is only available on the **Source 2** pop-up menu. It takes a sample of the modulation source whenever it receives a trigger signal. It holds the sampled value until it receives a new trigger. This way, you can quantize a continuous modulation signal.

The following **Sample & Hold** options are available:

### Trigger on Note-on

Triggers the **Sample & Hold** modifier manually each time that you hit a key.

### Trigger on LFO 1

Triggers the **Sample & Hold** modifier each time that the waveform of LFO 1 crosses the zero line from below.

### Trigger on LFO 2

Triggers the **Sample & Hold** modifier each time that the waveform of LFO 2 crosses the zero line from below.

### Trigger on Modulation Wheel

Triggers the **Sample & Hold** modifier each time that the modulation wheel passes the center position.

### Trigger on Sustain

Triggers the **Sample & Hold** modifier each time that you press the sustain pedal.

### Sample until Release

Triggers the **Sample & Hold** modifier each time that you release a key.

## Modulation Destinations

Depending on the selected type of zone, the available modulation destinations vary.

### Pitch

Modulates the pitch. For example, assign one of the LFOs to create a vibrato effect. If **Pitch** is selected, the modulation depth is set in semitones (-60 to +60).

### Cutoff

Modulates the filter cutoff.

For example, to create rhythmic patterns in the spectral timbre, assign the **Step Modulator**.

### Resonance

Modulates the filter resonance. Resonance changes the character of the filter.

For example, to increasingly accent the filter the harder you hit a key, assign **Velocity** to **Resonance**.

### Distortion

Modulates the filter distortion.

This has no effect on the **Classic**, **HALion 3**, and **Waldorf** filters.

### Morph X

Modulates the x-axis of the filter in **Morph XY** mode. Use this to morph between the filter shapes **AD** and **BC**.

### Morph Y

Modulates the y-axis of the filter in **Morph 2**, **Morph 4**, or **Morph XY** mode. Use this to morph between the filter shapes **AB** and **DC**, for example.

### Cutoff Offset

Modulates the cutoff offset of the second filter in **Dual Filter Serial** or **Dual Filter Parallel** mode. For example, to lower or raise the cutoff of the second filter while playing, assign the modulation wheel.

### Resonance Offset

Modulates the resonance offset of the second filter in **Dual Filter Serial** or **Dual Filter Parallel** mode. For example, to lower or raise the resonance of the second filter while playing, assign the modulation wheel.

### Level

Adds to the level setting. It can be used to create level offsets using the modulation wheel, for example.

### Volume 1

Modulates the gain. This modulation multiplies with the level.

It is ideal for crossfades between zones.

### **Volume 2**

As **Volume 1**, **Volume 1** is multiplied with **Volume 2**. This way, you can build more complex modulations.

### **Pan**

Modulates the position of the zone in the panorama.

### **Sample Start**

Modulates the start position of the sample playback. For example, assign **Note-on Velocity** to play back more of the attack of a sample the harder you hit a key. This modulation destination cannot be modulated continuously. The parameter is updated only when you hit a key.

### **Speed Factor**

Modulates the speed factor of the sample.

### **Formant Shift**

Modulates the formant shifting.

### **Grain Position**

Modulates the playback position. The modulation is not continuous, but it is updated at the start of each grain.

### **Grain Direction**

Modulates the **Direction** parameter. For the effect to be heard, the **Speed** parameter must be set to a value above 0%.

### **Grain Duration**

Modulates the grain duration, that is, the frequency at which the grains repeat. The maximum modulation range at a modulation depth of 100% is -5 to +5 octaves.

### **Grain Length**

Modulates the grain length.

### **Grain Pitch**

Modulates the pitch of a grain. The modulation is not continuous, but it is updated at the start of a new grain. For continuous pitch modulation, use **Pitch** instead of **Grain Pitch** as the destination, and make sure that **Follow Zone Pitch** is activated in the grain oscillator.

### **Grain Formant**

Modulates the pitch of the source sample, regardless of the grain duration. This results in formant shifting for short durations.

### **Grain Level**

Modulates the grain level. The modulation is not continuous, but it is updated at the start of each new grain. For continuous level modulation, use the destinations **Volume 1**, **Volume 2**, or **Level**.

### **Osc 1/2/3 Pitch**

Modulates the pitch of the corresponding oscillator.

For example, to detune an oscillator cyclically, assign one of the LFOs.

### **Osc 1/2/3 Level**

Modulates the level of the corresponding oscillator.

For example, to fade an oscillator in and out while you play, assign the modulation wheel.

### **Osc 1/2/3 Waveform**

Modulates the shape and character of the corresponding oscillator.

For example, to change the character of an oscillator over time, assign one of the envelopes.

### **Osc 1/2/3 Multi Detune**

Modulates the **Detune** parameter of the individual oscillator voices that are produced by the multi-oscillator mode.

### **Osc 1/2/3 Multi Pan**

Modulates the pan position of the individual oscillator voices that are produced by the multi-oscillator mode.

### **Osc 1/2/3 Multi Voices**

Modulates the number of oscillator voices that are produced by the multi-oscillator mode.

### **Sub Osc Level**

Modulates the level of the sub oscillator. For example, to fade in the oscillator while you play, assign the modulation wheel.

### **Ring Mod Level**

Modulates the level of the ring modulation effect. For example, to fade in the ring modulation while you play, assign the modulation wheel.

### **Noise Level**

Modulates the level of the noise generator. For example, to fade in the noise generator while you play, assign the modulation wheel.

### **Audio Input**

Modulates the level of the audio input that is received via the side-chain input of the plug-in.

### **LFO 1/2 Frequency**

Modulates the speed of the corresponding LFO.

For example, to control the speed of a vibrato effect while you play, assign **Aftertouch**.

### **LFO 1/2 Shape**

Modulates the waveform of the corresponding LFO.

For example, to vary the waveform with the playing position on the keyboard, assign **Key Follow**.

### **Step Mod Frequency**

Modulates the speed of the step modulator. For example, assign an LFO to increase or decrease the speed cyclically.

### **Step Mod Slope**

Modulates the shape of the edges of the step modulator if the **Slope** parameter is active. For example, assign the modulation wheel to blend from hard to smooth edges.

### **X-LFO Rate X**

Modulates the **Rate-X** parameter of the X-LFO.

### **X-LFO Rate Y**

Modulates the **Rate-Y** parameter of the X-LFO.

**Amp Env Attack Time**

Modulates the attack time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Decay Time**

Modulates the decay time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Sustain Level**

Modulates the sustain level of the amplitude envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Amp Env Release Time**

Modulates the release time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Attack Time**

Modulates the attack time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Decay Time**

Modulates the decay time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Sustain Level**

Modulates the sustain level of the filter envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Filter Env Release Time**

Modulates the release time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Pitch Env Start Level**

Modulates the level of the first pitch envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Pitch Env Attack Time**

Modulates the attack time of the pitch envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Pitch Env Attack Level**

Modulates the level of the second pitch envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Pitch Env Decay Time**

Modulates the decay time of the pitch envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Pitch Env Sustain Level**

Modulates the sustain level of the pitch envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Pitch Env Release Time**

Modulates the release time of the pitch envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Pitch Env Release Level**

Modulates the level of the last pitch envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

#### **User Env Start Level**

Modulates the level of the first user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

#### **User Env Attack Time**

Modulates the attack time of the user envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

#### **User Env Attack Level**

Modulates the level of the second user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

#### **User Env Decay Time**

Modulates the decay time of the user envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

#### **User Env Sustain Level**

Modulates the sustain level of the user envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

#### **User Env Release Time**

Modulates the release time of the user envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

#### **User Env Release Level**

Modulates the level of the last user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

#### **Bus 1-16**

You can send any modulation to one of the 16 busses, for example, to produce more complex modulation signals. Select the bus that you want to send the signals to as a destination. To use the modulation that was sent to a bus, assign the corresponding bus as a modulation source.

#### **Wavetable 1/2 Pitch**

Modulates the **Pitch** parameter of the corresponding wavetable oscillator.

#### **Wavetable 1/2 Level**

Modulates the **Level** parameter of the corresponding wavetable oscillator.

#### **Wavetable 1/2 Pan**

Modulates the **Pan** parameter of the corresponding wavetable oscillator.

#### **Wavetable 1/2 Multi Detune**

Modulates the multi-oscillator **Detune** parameter of the corresponding wavetable oscillator.

#### **Wavetable 1/2 Multi Pan**

Modulates the multi-oscillator **Pan** parameter of the corresponding wavetable oscillator.

#### **Wavetable 1/2 Multi Spread**

Modulates the multi-oscillator **Spread** parameter of the corresponding wavetable oscillator.

#### **Wavetable 1/2 Multi Voices**

Modulates the multi-oscillator **Voices** parameter of the corresponding oscillator.

**Wavetable 1/2 Position**

Modulates the **Position** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Direction**

Modulates the **Direction** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Speed**

Modulates the **Speed** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Formant Shift**

Modulates the **Formant Shift** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Formant Scale**

Modulates the **Formant Scale** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Filter Shift**

Modulates the **Filter Shift** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Filter Scale**

Modulates the **Filter Scale** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Target Speed**

Modulates the **Target Speed** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Acceleration**

Modulates the **Acceleration** parameter of the corresponding wavetable oscillator.

**Wavetable Sub Pitch**

Modulates the **Pitch** parameter of the wavetable sub oscillator.

**Wavetable Sub Level**

Modulates the **Level** parameter of the wavetable sub oscillator.

**Wavetable Sub Pan**

Modulates the **Pan** parameter of the wavetable sub oscillator.

**Wavetable Noise Speed**

Modulates the **Speed** parameter of the wavetable noise oscillator.

**Wavetable Noise Level**

Modulates the **Level** parameter of the wavetable noise oscillator.

**Wavetable Noise Pan**

Modulates the **Pan** parameter of the wavetable noise oscillator.

**FM Operator 1-8 Level**

Modulates the **Level** parameter of the corresponding operator.

This destination can be used to create level offsets using the modulation wheel, for example.

**FM Operator 1-8 Pitch**

Modulates the **Pitch** parameter of the corresponding operator.

For example, assign one of the LFOs to create a vibrato effect. With **Pitch** selected, the modulation depth is set in semitones.

**FM Operator 1-8 Time Scale**

Modulates the **Time Scale** parameter of the corresponding operator, that is, the overall time of its level envelope.



This destination can be used to control the total length of the envelope using the modulation wheel, for example.

#### **FM Feedback**

Modulates the global **Feedback** parameter.

This destination can be used to control the overall feedback using the modulation wheel, for example.

#### **FM Modulator Level**

Modulates the **Level** parameter of all operators that act as modulators. This way, all sound-changing components are modulated in the same way.

##### **NOTE**

This modulation destination does not affect carrier operators.

---

#### **FM Modulator Time Scale**

Modulates the **Time Scale** parameter of all operators that act as modulators.

##### **NOTE**

This modulation destination does not affect carrier operators.

---

#### **FM Carrier Time Scale**

Modulates the **Time Scale** parameter of all operators that act as carriers.

##### **NOTE**

This modulation destination does not affect modulator operators.

---

#### **Spectral Multi Voices**

Modulates the multi-oscillator **Voices** parameter of the spectral oscillator.

#### **Spectral Multi Detune**

Modulates the multi-oscillator **Detune** parameter of the spectral oscillator.

#### **Spectral Multi Pan**

Modulates the multi-oscillator **Pan** parameter of the spectral oscillator.

#### **Spectral Multi Spread**

Modulates the multi-oscillator **Spread** parameter of the spectral oscillator.

#### **Spectral Position**

Modulates the **Position** parameter of the spectral oscillator.

#### **Spectral Direction**

Modulates the **Direction** parameter of the spectral oscillator.

#### **Spectral Speed**

Modulates the **Speed** parameter of the spectral oscillator.

#### **Spectral Target Speed**

Modulates the **Target Speed** parameter of the spectral oscillator.

#### **Spectral Acceleration**

Modulates the **Acceleration** parameter of the spectral oscillator.

**Spectral Purity**

Modulates the **Purity** parameter of the spectral oscillator.

**Spectral Inharmonicity**

Modulates the **Inharmonicity** parameter of the spectral oscillator.

**Spectral Formant Shift**

Modulates the **Formant Shift** parameter of the spectral oscillator.

**Spectral Formant Scale**

Modulates the **Formant Scale** parameter of the spectral oscillator.

**Spectral Low Cut Amount**

Modulates the **Low Cut** parameter on the **Filter** tab of the spectral oscillator.

# Editing Samples in the Sample Editor

The **Sample Editor** allows you to view and edit samples. If a sample zone is selected, the **Sample Editor** shows the corresponding sample.

## Loading and Previewing Samples

The controls in the **Sample Editor** header allow you to load a sample and make preview settings.



### Load/Replace Sample

Allows you to load a new sample or replace the current sample.

If you replace a sample, the following applies:

- Samples that were replaced are shown in a different color.
- The **Sample Editor** does not show the waveform of the replaced sample, only the original sample waveform.

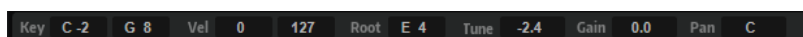
### Preview Volume/Output for Preview

You can specify the playback volume and output for the **Sample Editor** with the **Preview Volume** and **Output for Preview** controls in the upper right corner of the editor.

## Zone Info Bar

This bar shows information on the zone.

- To show/hide the zone info bar, click **Show/Hide Zone Info Bar**  on the toolbar.



### Key Range

With the **Low Key** and **High Key** value fields, you can set the key range for the selected zone.

### Velocity Range

With the **Low Velocity** and **High Velocity** value fields, you can set the velocity range for the selected zone.

### Root Key

The root key determines the original pitch of a zone, that is, the key on which the zone is played without being transposed.

For grain and sample zones, the following additional options are available:

### Tune

Sets the tune offset of the zone.

This value can be written into the sample file on export and is read on import.

### Gain

Sets the gain offset of the zone.

This value can be written into the sample file on export and is read on import.

### Pan

Allows you to specify a pan offset for the zone.

## Toolbar

The toolbar contains tools for editing sample markers, loop markers, and slices, for example.

Depending on the tab that is selected, the toolbar contains different tools.

### Main Tab



### Play Sample

Plays back the raw sample.

### Play Selection Looped

Activate this button to play back the selection in a loop.

### Auto-Scroll

If this button is activated, the waveform display is scrolled during playback, keeping the playback cursor visible.

### Follow Sample Playback

Activate this button to see a playback cursor when triggering a sample via MIDI.

### Range Selection Tool

Click and drag with this tool to create a selection.

### Zoom Tool

If this tool is selected, you can click in the waveform to zoom in on the position where you click.

### Play Tool

If this tool is selected, you can click in the waveform to start playback. The sample is played back from this position until you release the mouse button.

### Scrub Tool

If this tool is selected, you can click in the waveform and drag sideways to play back the audio. The playback direction and speed depend on how fast and how far you move the mouse to the left or to the right from the position where you clicked.

### Snap

If this button is activated, the selection start and end points and the markers snap to other markers.

### Snap to Zero Crossing

If this button is activated, markers and selection start and end points are only placed at zero crossings, that is, at positions in the audio where the amplitude is zero. This helps you to avoid pops and clicks that are caused by sudden amplitude changes.

### Trim Sample

Trims the sample, either to the selection or to the range that is set with the sample start/end markers.

### Revert to Full Sample

Undoes the trimming, so that the entire sample is restored.

#### NOTE

After undoing the trimming, make sure to set the start/end markers to their original positions. Otherwise, these parts are not played back.

---

### Normalize Sample

Normalizes the sample by detecting the highest peak level in the sample and adjusting the gain to reach a predefined level.

### Normalize Level

Sets the level for the **Normalize Sample** function.

### Show Pitch Detection Curve

Shows/Hides the pitch detection curve.

### Detected Pitch

Shows the average pitch of the whole sample. If a range is selected, the average pitch of the selection is shown.

### Transfer Pitch to Root Key

Sets the analyzed pitch value as the root key for the sample.

### Edit in External Editor

Allows you to open the sample in an external editor.

#### NOTE

This function is only available if an external editor is specified in the **Edit** section of the **Options Editor**.

---

## Loop Tab

With the **Loop** tab selected, the following additional tools are available on the toolbar:



### Sustain/Release Loop

Switches between the display of the sustain loop and the release loop in the waveform display.

### Edit Loop

If this button is activated, the editor shows the looped region as an overlay, with the original sample in the background. This provides a better overview over the transition between loop end and loop start and allows you to set the loop markers to the best positions.

#### NOTE

If **Loop Mode** is deactivated when you activate **Edit Loop**, it is automatically set to **Continuous** and the loop markers are placed at the start and end of the sample.

---

### Show Resulting Loop Crossfade

Activate this button to see the effect of your crossfade settings in the waveform display. If this button is activated, the resulting waveform is displayed in red.

#### NOTE

This button only has an effect if **Edit Loop** is activated.

---

### Find Previous Loop Start/Find Next Loop Start

Automatically detects a suitable loop start, either before (previous) or after (next) the current loop start.

### Find Previous Loop End/Find Next Loop End

Automatically detects a suitable loop end, either before (previous) or after (next) the current loop end.

### Loop Transition

Activate this button by setting it to **t** (transition) to search for short loops. Deactivate it by setting it to **T** (timbre) to search for longer loops.

It can be useful to search for longer loops if the sample contains longer sound progressions or beats that need to be included. This way you can prevent the resulting loop from becoming static.

If this button is deactivated, HALion also suggests loop marker positions that might not be optimal regarding the local transition, but best reflect the tonal progression of the sound. In this case, you can use the **Crossfade** function to smooth out the loop.

### Threshold

HALion detects a large number of possible loop marker positions for the loop. These positions are evaluated internally and attributed a score, according to quality. The **Threshold** parameter allows you to specify the score value that a marker must have before it can be used. With the highest setting, only a few suitable positions are suggested.

### Loop Score

Each detected loop marker is evaluated and attributed a score that provides additional information about how well loop start and end match.

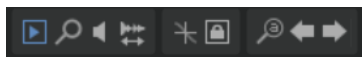
#### NOTE

This value is only updated when you search for loop positions using the **Find Previous/Next Loop Start/End** buttons.

---

## Slice Tab

If the **Slice** tab is selected, the following additional tools are available on the toolbar:



### Play Slice Tool

If this tool is selected, you can play slices by clicking on them.

### Lock Slices

Activate this button to prevent slice markers from being accidentally moved. Locked slices are shown with red markers.

### **Auto Zoom Slices**

If this button is activated and you step through slice zones in the **Program Tree**, the slices are zoomed automatically so that they are centered in the waveform display.

### **Zoom to Previous Slice/Zoom to Next Slice**

Click these buttons to zoom in on the previous/next slice.

## **Decompose Tab**

### **Play Sample**

Plays back the raw sample.

### **Play Selection Looped**

Activate this button to play back the selection in a loop.

### **Auto-Scroll**

If this button is activated, the waveform display is scrolled during playback, keeping the playback cursor visible.

### **Follow Sample Playback**

Activate this button to see a playback cursor when triggering a sample via MIDI.

### **Range Selection Tool**

Click and drag with this tool to create a selection.

### **Zoom Tool**

If this tool is selected, you can click in the waveform to zoom in on the position where you click.

### **Play Tool**

If this tool is selected, you can click in the waveform to start playback. The sample is played back from this position until you release the mouse button.

### **Scrub Tool**

If this tool is selected, you can click in the waveform and drag sideways to play back the audio. The playback direction and speed depend on how fast and how far you move the mouse to the left or to the right from the position where you clicked.

### **Snap**

If this button is activated, the selection start and end points and the markers snap to other markers.

### **Snap to Zero Crossing**

If this button is activated, markers and selection start and end points are only placed at zero crossings, that is, at positions in the audio where the amplitude is zero. This helps you to avoid pops and clicks that are caused by sudden amplitude changes.

### **Trim Sample**

Trims the sample, either to the selection or to the range that is set with the sample start/end markers.

### **Revert to Full Sample**

Undoes the trimming, so that the entire sample is restored.

#### **NOTE**

After undoing the trimming, make sure to set the start/end markers to their original positions. Otherwise, these parts are not played back.

---

### Normalize Sample

Normalizes the sample by detecting the highest peak level in the sample and adjusting the gain to reach a predefined level.

### Normalize Level

Sets the level for the **Normalize Sample** function.

### Show Pitch Detection Curve

Shows/Hides the pitch detection curve.

### Detected Pitch

Shows the average pitch of the whole sample. If a range is selected, the average pitch of the selection is shown.

### Transfer Pitch to Root Key

Sets the analyzed pitch value as the root key for the sample.

### Edit in External Editor

Allows you to open the sample in an external editor.

#### NOTE

This function is only available if an external editor is specified in the **Edit** section of the **Options Editor**.

---

## Info Line

The info line shows information on the sample file and the selection.



Len	87668	Rate	44.100	BPM	120.73	Pos	5905	Sel	5905	-	25563	=	19658
-----	-------	------	--------	-----	--------	-----	------	-----	------	---	-------	---	-------

### File Length

Shows the length of the sample file.

### Sample Rate

Shows the sample rate of the sample file.

### File Tempo

Shows the tempo of the sample file, in BPM.

### Playback Position

Shows the playback position.

To change the playback position, use the arrow buttons or enter a new position in the value field.

### Selection Start

Sets the start of the selection.

### Selection End

Sets the end of the selection.

### Selection Length

Sets the length of the selection.

### Key Range

With the **Low Key** and **High Key** value fields, you can set the key range for the selected zone.



### Velocity Range

With the **Low Velocity** and **High Velocity** value fields, you can set the velocity range for the selected zone.

### Root Key

The root key determines the original pitch of a zone, that is, the key on which the zone is played without being transposed.

### Tune

Sets the tune offset of the zone.

This value can be written into the sample file on export and is read on import.

### Gain

Sets the gain offset of the zone.

This value can be written into the sample file on export and is read on import.

### Pan

Allows you to specify a pan offset for the zone.

If the **Slice** tab is selected, the info line contains the following slice-specific settings:

### Sample Length

Shows the length of the sample.

### Tempo

Shows the tempo of the sample, in BPM.

### Bars/Beats

Shows the length of the sample found by the automatic tempo detection, in bars and beats.

#### NOTE

You can adjust these values manually. This has an effect on the grid and the tempo.

---

### Grid

Allows you to display a grid in the waveform display.

### Grid Resolution

Sets the grid resolution, in note values.

### Signature

Allows you to specify the time signature of the loop.

### Offset

Offsets the grid by the specified value.

## Overview Line

The overview line shows the entire sample. The section that is visible in the waveform display is indicated by a rectangle. The current selection range in the waveform display is shown in brown.

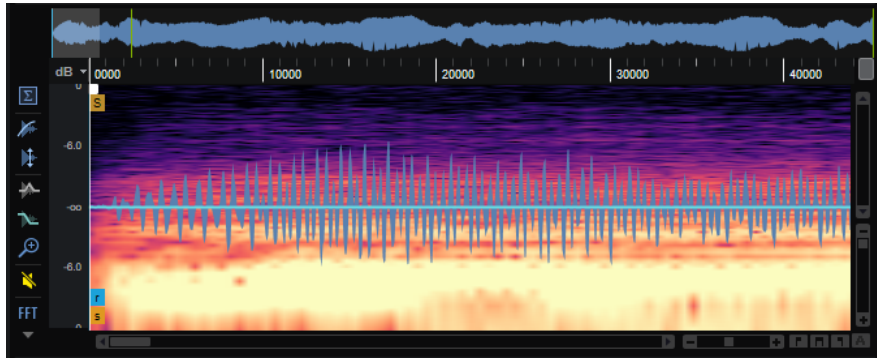


- To view a different section of the sample, click in the lower half of the rectangle and drag to the left or right.

- To show a larger or a smaller range of the sample in the main waveform display, resize the rectangle by dragging its borders.
- To specify a new sample range for the main waveform display, click in the upper half of the overview and drag.

## Waveform Display

The waveform display shows the waveform image of the sample. To the left of the waveform display, a level scale is shown, indicating the amplitude of the audio.



- To select whether the level is shown as a percentage or in dB, click the level scale label at the top (dB or %), and select an option from the pop-up menu.
- To display the half level axis, right-click in the waveform display, and select the corresponding option from the context menu.

## Ruler

The ruler shows the timeline in the specified display format.

- To select the format, click the arrow button to the right of the ruler and select an option from the pop-up menu.  
You can choose to display bars and beats, seconds, or samples.

## View Options

### Display Channel pop-up menu




You can display either all channels, a specific channel, or the sum of all channels by selecting the corresponding option from the **Display Channel** pop-up menu. To open the menu, click the topmost button to the left of the waveform display. The icon displayed on the button indicates the current setting.




NOTE

Which channel options are available depends on the sample file.

### Show Fades in Wave

With **Show Fades in Wave**  activated, your fade settings are displayed directly in the waveform.

### Show Gain in Wave

- With **Show Gain in Wave**  activated, the waveform display shows the influence of the **Gain** parameter on the sample. The gain can either be set manually or by using the **Normalize** function.
- If this button is deactivated, the original raw sample data is shown.


### Show Pitch Envelope/Show Level Envelope

You can edit the pitch and the level of a sample using the integrated pitch and level envelopes. This allows you to modify the pitch of the attack portion of a sample or to correct the pitch or the level of a loop end so that it matches the loop start, for example. Both envelopes are applied when you play a sample using your MIDI keyboard.


To edit an envelope, click **Show Pitch Envelope**  or **Show Level Envelope** .

- To offset the pitch or level of an entire sample, add a single node and move it up or down from the center position.
- To add a further node to the envelope, double-click the curve.
- To remove a node, double-click it.
- To reset a node to its neutral position, **Ctrl/Cmd**-click it.


### Zoom Envelope

Zoom Envelope  zooms in on the pitch and level envelopes. This allows you to edit the envelopes in more detail.

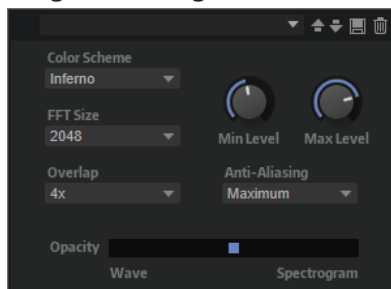
### Bypass Gain, Tuning, Fades, and Envelopes in Editor Playback

Activate **Bypass Gain, Tuning, Fades, and Envelopes in Editor Playback**  to bypass any level and pitch corrections that are performed by changing the gain of the sample, using fade curves, the pitch envelope, and the level envelope.

### Show Spectrogram

The sample display can either show the sample waveform, the spectrogram, or a blend of both. Activate **Show Spectrogram**  if you are searching for the ideal sample start or release marker positions, for example. This allows you to see more precisely where the sample starts or where overtones have faded out.

### Spectrogram Settings



- **Color Scheme** allows you to choose a color scheme.

- **FFT Size** sets the block size of the window that is used for the analysis. This allows you to adjust the trade-off between temporal resolution and frequency resolution. If you specify a higher value, more frequencies are analyzed, but they are located less accurately within the time domain.
- **Overlap** sets the number of overlapping FFT windows. Increasing the overlap can be used to reduce analysis limitations of the FFT windows, which can lead to a loss of details, such as transients.
- **Min Level** sets the minimum value of the scale.
- **Max Level** sets the maximum value of the scale.
- **Anti-Aliasing** can be used to improve the display quality.
- The **Opacity** slider allows you to seamlessly blend between sample and FFT display.

## Parameter Section

The parameter section below the waveform display contains sample and sample zone parameters.

### NOTE

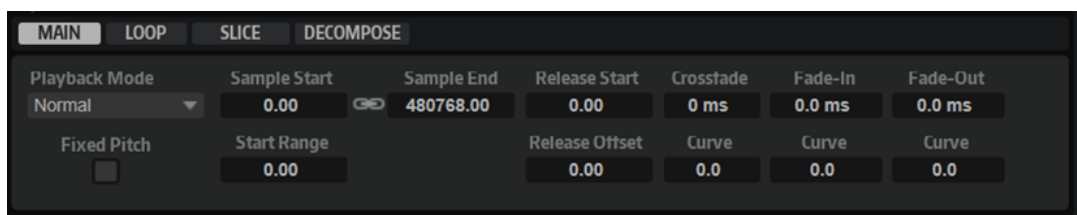
The **Sample Oscillator** parameters on the **Main** and **Loop** tabs can be edited for multiple samples at the same time. This can be useful to add a fade to a multi-selection or to set loop markers for several samples that contain different microphone signals of the same instrument, for example.

### RELATED LINKS

[Filter Section](#) on page 180

## Main Page

The **Main** page contains the zone parameters, the marker settings, and the fade settings for the sample.



### Playback Mode

- **Normal** – The sample is played back from beginning to end. If loops are defined, they are played back according to their loop settings.
- **Reverse** – The sample is played from end to beginning. If loops are defined, they are played back according to their loop settings.
- **One-Shot** – The sample is played back from beginning to end, regardless of any loop settings.
- **Reverse One-Shot** – The sample is played back from end to beginning, regardless of any loop settings.

In **One-Shot** and **Reverse One-Shot** mode, the zones ignore any MIDI note-off messages. All envelopes and LFOs play until their sustain is reached and then remain

at this level for as long as the sample plays back. Any release segments of the envelopes and LFOs are not played. However, if you activate **One-Shot** mode in the **Envelope** section, the release nodes of the envelopes are included in the playback.

### Fixed Pitch

If a sample zone is triggered by a MIDI note other than the one defined by the **Root Key** setting, the sample is normally pitched accordingly. With **Fixed Pitch** activated, the relation between played note and root key is disregarded, and all keys play the sample, just as it was recorded.

#### NOTE

You can still apply the usual pitch modulations in the **Pitch** section and set the sample to follow the keyboard according to the **Pitch Key Follow** setting.

---

### Sample Start

The start marker of the sample.

### Sample End

The end marker of the sample.

### Link Sample Start and End

Links the sample start and end positions. If you edit one of the values, the other value is automatically modified.

#### NOTE

You cannot change the sample start or end positions beyond the limits of the sample file. For example, if the end of the sample is reached and you raise the **Sample Start** value, the **Sample End** value is not modified.

---

### Start Range

Determines the range for sample start offset modulation. If **Sample Start** is selected as a modulation destination in the modulation matrix, the **Start Range** parameter controls the sample portion that is affected by the start offset modulation. If this parameter is set to zero, no sample start modulation is performed.

For example, if **Note-on Velocity** is used to modulate the **Sample Start** parameter, a high key velocity starts playback later in the sample, and the range of this modulation is determined by the **Start Range** parameter.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

### Release Start

Determines the position to which the cursor jumps when you release a key.

For example, if you are playing back a sample in a loop but you want it to play its original release phase, set the **Release Start** parameter to this position.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can also drag the marker to adjust the parameter.

### Release Offset

Allows you to fine-tune the release start for each sample.

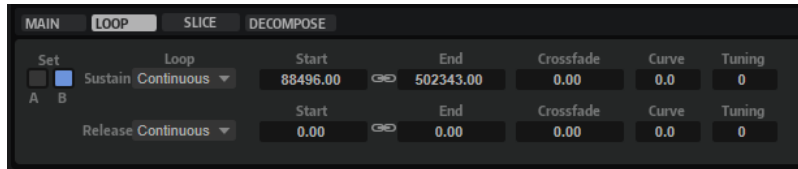
This allows you to offset the release start for several zones at the same time without losing the original release settings, for example.

### Crossfade/Fade In/Fade Out

Allow you to set the curve and the length of the fade in, the fade out, and the crossfade.

## Loop Page

The **Loop** page contains settings for the sustain loop and the release loop, and lets you set up two different loop sets.



### Loop Sets A and B

Allow you to set up two different sets of loops for the same sample. This is useful to compare different versions of the same loop, for example.

### Loop Mode

Allows you to select a mode for the sustain loop and the release loop.

- If this is set to **No Loop**, the sample is played without a loop.
- If this is set to **Continuous**, the loop is played continuously until the end of the amplitude envelope.
- If this is set to **Alternate**, the loop runs back and forth, even if you release the key.
- If this is set to **Once**, the loop is repeated once.
- If this is set to **Until Release** (sustain loop only), the loop is repeated until you release the key on the keyboard.
- If this is set to **Alternate Until Release** (sustain loop only), the loop runs back and forth for as long as the key is held, and then continues to the end of the sample.

#### NOTE

If **Loop Mode** is set to **Alternate** or **Alternate Until Release**, the loop crossfade is applied to the loop start and the loop end. All other modes on the **Loop Mode** pop-up menu apply the loop crossfade to the loop end only.

### Loop Start

Defines the loop start for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Loop End

Defines the loop end for the sustain loop and for the release loop.

If a value is specified for this parameter, a marker line is shown in the waveform display. You can drag the marker to adjust the parameter.

### Link Loop Start and End

Links the loop start and end positions. If you edit one of the values, the other one is automatically modified.

### Crossfade

Allows you to introduce a crossfade between loop end and loop start. Crossfades allow for smoother transitions.

### Curve

Allows you to create a linear curve, an equal power curve, or anything in between for the crossfade.

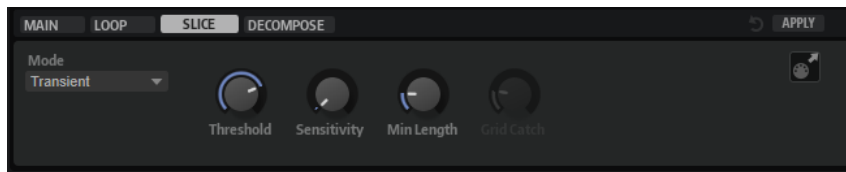
### Tuning

Sets the tuning of the loop. This is useful to adjust the frequency of the loop.

## Slice Page

The parameter section on the **Slice** page contains different parameters, depending on whether slices have been created or not.

If no slices have been created, the following parameters are available:



### Slice Detection Mode

The slice detection automatically sets slice markers in the waveform.

- **Transient** mode allows you to set the minimum peak level that a transient needs to be detected as the start of a new slice.
- **Grid** mode sets the slice markers according to a beat grid.
- **Transient + Grid** detects slices that fulfill both conditions.
- **Manual** mode deactivates automatic slice detection. In this mode, you can only set slice markers manually.

#### NOTE

You can always add slice markers manually by **Alt/Opt**-clicking in the waveform.

---

### Threshold

Determines the minimum level that a transient must have to be detected as the start of a new slice.

### Sensitivity

The transient detection evaluates all transients and classifies them according to their quality. The **Sensitivity** control allows you to define the quality that must be matched before a slice marker can be set.

### Min Length

Determines the minimum length of a slice. Use this parameter to avoid creating slices that are too short.

### Grid Catch

In **Transient+Grid** mode, you can use this control to specify how close to the grid a transient marker must be.

### Reset Slice Marker Edits

Removes all slice markers that you have edited manually and repositions any moved markers.

## Apply

Click this button to create slices. After clicking **Apply**, the label on the button changes to **Revert** and allows you to undo the slicing.

If slices have been created, the following parameters are available:



## Playback Mode

- **Normal** – The sample is played back from beginning to end. If loops are defined, they are played back according to their loop settings.
- **Reverse** – The sample is played from end to beginning. If loops are defined, they are played back according to their loop settings.
- **One-Shot** – The sample is played back from beginning to end, regardless of any loop settings.
- **Reverse One-Shot** – The sample is played back from end to beginning, regardless of any loop settings.

In **One-Shot** and **Reverse One-Shot** mode, the zones ignore any MIDI note-off messages. All envelopes and LFOs play until their sustain is reached and then remain at this level for as long as the sample plays back. Any release segments of the envelopes and LFOs are not played. However, if you activate **One-Shot** mode in the **Envelope** section, the release nodes of the envelopes are included in the playback.

## Filter Type

Specifies the basic sound character of the filter.

- **Off** deactivates the filter section.
- **Classic** offers 24 filter shapes with resonance.
- **Tube Drive** adds warm, tube-like distortion. You can set the amount of tube drive with the **Distortion** parameter.
- **Hard Clip** adds bright, transistor-like distortion. You can set the amount of hard clipping with the **Distortion** parameter.
- **Bit Red** (Bit Reduction) adds digital distortion by means of quantization noise. You can adjust the bit reduction with the **Distortion** parameter.
- **Rate Red** adds digital distortion by means of aliasing. You can adjust the rate reduction with the **Distortion** parameter.
- **Rate Red KF** adds digital distortion by means of aliasing. In addition, **Key Follow** is used. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.
- **HALion 3** offers the five legacy filter shapes from HALion 3.
- **Waldorf** offers 13 filter shapes, including two comb filters.
- **Eco** is a performance-optimized low-pass filter without **Resonance** or **Distortion** parameters. It allows you to adapt the brilliance of samples for different velocity layers of the same key, for example.

## NOTE

Filters without distortion use less processing power.

---



### Coarse Tuning

Adjusts the tuning in semitone steps.

### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### Distortion

Adds distortion to the signal. The effect depends largely on the selected filter type. At higher settings, it creates a very intense distortion effect.

#### NOTE

This parameter is only available for the filter types **Tube Drive**, **Hard Clip**, **Bit Red**, **Rate Red**, and **Rate Red KF**.

---

### Morph X/Y

These controls are available if the filter types **Morph 2**, **Morph 4**, or **Morph XY** are used in the **Filter** section in the **Zone Editor** for the sample zone. With **Morph X/Y**, you can adjust two parameters simultaneously.

- For the filter types **Morph 2** and **Morph 4**, the **Y** control adjusts the morphing between the filter shapes.
- For **Morph XY**, the **Morph X** control adjusts the morphing between the filter shapes **AD** and **BC** and the **Morph Y** control adjusts the morphing between the filter shapes **AB** and **DC**.


### Level

Sets the level of the selected slice.

### Pan

Sets the panorama position for the selected slice.

### Drag MIDI Phrase to Host Sequencer

To export your slice markers as MIDI phrase, drag the MIDI export field  to your host sequencer or another destination that can handle MIDI files. This MIDI file is used to play the sliced loop.

### Reset Slice Marker Edits

Removes all slice markers that you have edited manually and repositions any moved markers.

### Revert

Click this button to remove any slice marker modifications, to undo the slicing, and to remove the layer with the sliced zones from the **Program Tree**.

## AUX Page

If you have created slices, the **AUX** page becomes available.



### AUX 1-4

You can send the signal of the selected slice to the global, or, if available, the local AUX busses. Use the controls to specify the level that is sent to each AUX bus.

### Fade In/Fade Out

Defines a fade in or a fade out for the selected slices. This can be used to remove unwanted clicks if the audio is difficult to slice.

## Decompose Page

The **Decompose** function allows you to split your samples into their noise and tonal components. This allows you to edit the tonal and the noise components of your samples separately, for example, to change the distribution between the noise and tonal portions of a sample.



### Prelisten

Calculates the tonal and noise components of your sample according to the current settings. This allows you to prelisten your **Decompose** settings.

- If **Solo Tonal** or **Solo Noise** is activated, you hear the tonal or the noise components of the layer.
- If **Mix** is activated, you hear the mix that you adjust with the **Tonal Level** and **Noise Level** controls.

### Apply

Applies the **Decompose** function.

#### NOTE

- If **Mix** is activated, this replaces the sample.
- If **Solo** is activated for the tonal or the noise components, only this component replaces the sample in the layer.
- If **Mix** and **Solo** are both deactivated, two new layers are created, one for the tonal and one for the noise component of the sample.

---

### Sensitivity

Allows you to specify the level difference that is required between the signal partials and the noise floor. The value you specify defines the minimum distance between the peaks and the troughs of the spectrum for a partial to be detected. If you lower this value, more signal portions of the sample are considered to belong to the tonal component.

### Cutoff

Allows you to define the upper limit of the range in which HALion searches for partials. Any signals above the **Cutoff** frequency are considered as noise, regardless of the **Sensitivity** or **Duration** settings.

### Duration

Allows you to specify the minimum length for a partial. Signals that are shorter than the value specified are automatically considered as noise; longer signals are considered as belonging to the tonal component.

You can try to lower this setting if you work with samples that have fast attacks or strong transients which were not detected correctly by the **Decompose** function.

### Tonal Level

Allows you to adjust the level of the tonal component.

Activate **Solo Tonal** to listen to the tonal component only.

#### NOTE

Make sure that **Solo Tonal** is deactivated when you click **Apply**. Otherwise, the layer is overwritten with the tonal component of the sample.

---

### Noise Level

Allows you to adjust the level of the noise component.

Activate **Solo Noise** to listen to the noise component only.

#### NOTE

Make sure that **Solo Noise** is deactivated when you click **Apply**. Otherwise, the layer is overwritten with the noise component of the sample.

---

### Mix

If this is activated, you can modify the mix with the **Tonal Level** and **Noise Level** dials and save the adjusted mix as a new file.

### Create Layer

Allows you to move the resulting tonal and noise samples to a new layer.

### Keep Zone

Allows you to keep the original zone after decomposing.

### Decompose Settings

Opens a page where you can specify the save location for the files created with the **Decompose** function.

#### RELATED LINKS

[Decompose Settings](#) on page 239

## Decomposing Samples

The **Decompose** function separates the noise and the tonal components of a sample and allows you to save these components separately as new samples.

#### PREREQUISITE

- You have selected a sample, grain, or spectral zone in the **Program Tree**.

---

PROCEDURE

1. Activate **Prelisten**.  
HALion calculates the tonal and the noise components of the layer.
2. Activate **Solo Tonal** or **Solo Noise** and play back the corresponding component.
3. Try out different **Sensitivity**, **Cutoff**, and **Duration** settings.  
The **Prelisten** function recalculates the tonal and noise components automatically when you modify the parameters. During this process, an indicator is shown above the **Prelisten** button.
4. Optional: Use the **Tonal Level** and **Noise Level** controls to adjust the level of the corresponding component.

NOTE

Once you have identified the settings that you want to use, be sure to deactivate **Solo Tonal/Solo Noise**. Otherwise, only the corresponding component is saved when you click **Apply**.

---

5. Click **Apply** to decompose the sample.
- 

RESULT

Two new samples are created, one for the tonal and one for the noise component of the sound. They are saved with the extensions "\_noise" and "\_tonal", respectively.

NOTE

If a sample with the same name already exists at the save location, for example, because you tried out different **Decompose** settings, a number is added to the new file name. No sample files are overwritten by the **Decompose** function.

---

AFTER COMPLETING THIS TASK

You can now edit the tonal and noise samples separately, combine them differently, etc.

RELATED LINKS

[Changing the Distribution of the Tonal and the Noise Components of Samples](#) on page 238  
[Decompose Section](#)

## Changing the Distribution of the Tonal and the Noise Components of Samples

The **Decompose** function allows you to mix the noise and the tonal components of samples individually. This can be used to change the level of the snares of a snare drum, for example.

PREREQUISITE

You have selected the zone that you want to decompose.

---

PROCEDURE

1. Click **Prelisten**.
  2. Modify the mix by adjusting the **Tonal Level** and **Noise Level** parameters.
  3. When you are satisfied with the mix, activate **Mix** and click **Apply**.
-

## RESULT

The modified mix of the two components replaces the original sample of the zone. The corresponding file is saved with the extension “\_mix”.

## NOTE

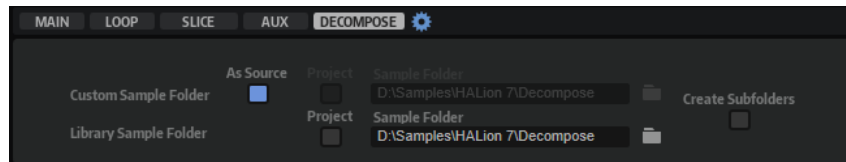
If a sample with the same name already exists at the save location, a number is added to the file name. No sample files are overwritten by the **Decompose** function.

---

## Decompose Settings

By default, the samples created using the **Decompose** function are saved in the same folder as the original file. However, if this is not what you want or if you decompose samples that are part of a write-protected VST Sound container, you can specify an alternative destination folder on the **Decompose Settings** page.

In the **Custom Sample Folder** section, you can specify the location for samples that are created from unprotected source samples, and in the **Library Sample Folder** section, you can specify the location for samples that are created from write-protected VST Sound containers.



### As Source

Activate **As Source** to save the created samples in the same folder as the original sample.

## NOTE

**As Source** is only available if you work with source samples that are not part of a VST Sound container.

---

### Project

Activate **Project** to save the samples in the project folder of your Steinberg DAW.

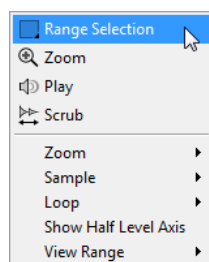
### Custom Sample Folder

If **Project** is not activated, you can enter the path to the folder in which the new samples are to be saved. You can enter the path manually in the text field or click **Select Folder** and browse to the destination folder.

### Create Tonal and Noise Subfolders

Allows you to save the tonal and the noise components in different subfolders.

## Sample Editor Context Menu



### Range Selection Tool

Click and drag with this tool to create a selection.

### Zoom Tool

If this tool is selected, you can click in the waveform to zoom in on the position where you click.

### Play Tool

If this tool is selected, you can click in the waveform to start playback. The sample is played back from this position until you release the mouse button.

### Scrub Tool

If this tool is selected, you can click in the waveform and drag sideways to play back the audio. The playback direction and speed depend on how fast and how far you move the mouse to the left or to the right from the position where you clicked.

### Zoom

- **Zoom In** zooms in one step.
- **Zoom Out** zooms out one step.
- **Zoom Full** displays the entire sample in the waveform display.
- **Toggle Zoom Full/Last** switches between the last zoom setting and the display of the entire sample.
- **Undo/Redo Zoom** allow you to undo/redo the last zoom setting.
- **Zoom to Selection** zooms in on the current selection.
- **Zoom to Sample Start/End** zooms in on the sample start or end marker, depending on which is nearer to the position of the cursor.
- **Zoom to Sample Start** zooms in on the start marker of the sample.
- **Zoom to Sample Start Range** zooms in on the start range.
- **Zoom to Sample End** zooms in on the end marker of the sample.
- **Zoom to Sustain Loop** zooms in on the entire sustain loop.
- **Zoom to Sustain Loop Start** zooms in on the start of the sustain loop.
- **Zoom to Sustain Loop End** zooms in on the end of the sustain loop.
- **Zoom to Release Start** zooms in on the release start.
- **Zoom to Start** zooms in on the start of the sample file.
- **Zoom to End** zooms in on the end of the sample file.
- **Zoom to Range** zooms in on the selection range.

### Sample

- **Read Root Key and Tuning From File** allows you to set the root key and tuning to the values that are saved in the sample file. The current zone settings are overwritten by the sample file settings.

#### NOTE

This option is only available if the corresponding information is available in the sample file.

- **Show in Explorer/Finder** navigates to the file in the File Explorer/macOS Finder.
- **Read Loop from File** allows you to set loop markers to the values that are saved in the sample file. The current zone settings are overwritten by the sample file settings.

**NOTE**

This option is only available if the corresponding information is available in the sample file.

- **Open in External Editor** allows you to open and edit the sample in an external editor.

**NOTE**

This function is only available if an external editor is specified in the **Edit** section of the **Options Editor**.

- **Trim Sample to Start/End** trims the sample according to the start and end markers.
- **Trim Sample to Selection** trims the sample according to the current selection range.
- **Normalize Sample** allows you to normalize the sample.

**Loop**

- **Copy Sustain Loop to Release Loop** copies the start/end marker positions of the sustain loop to the release loop.
- **Copy Release Loop to Sustain Loop** copies the start/end marker positions of the release loop to the sustain loop.
- **Copy Loop A to B** copies the settings of loop A to loop B.
- **Copy Loop B to A** copies the settings of loop B to loop A.
- **Set Sustain Loop to Sample Start/End** sets the sustain loop start and end marker positions to those of the sample start and end markers. This is useful for drum loops, for example.
- **Set Sample Start/End to Sustain Loop** sets the sample start and end marker positions to those of the sustain loop start and end markers. This can be used to create sliced loops from longer sample files.

**Selection**

- **Set Sample Start/End to Selection** moves the start and end points of the sample to the start and end points of the selection range.
- **Set Sustain Loop to Selection** moves the sustain loop markers so that they encompass the selection range.
- **Set Release Loop to Selection** moves the release loop markers so that they encompass the selection range.
- **Create Zone from Selection** creates a new sample zone from the selection range.

**Show Half Level Axis**

Activate this option to show the half level axes in the waveform display.

**View Range**

- **Auto** uses the view range of the previous sample.
- **Last** restores the view range that is saved with the sample.
- **Full** shows the entire sample.
- **Sample** shows the range between sample start and sample end markers.
- **Sample Start** shows the sample start marker with the current zoom factor.

- **Sample Start Range** shows the sample start range marker with the current zoom factor.
- **Sample End** shows the sample end marker with the current zoom factor.
- **Sustain Loop** shows the entire sustain loop.
- **Sustain Loop Start** shows the start marker of the sustain loop with the current zoom factor.
- **Sustain Loop End** shows the end marker of the sustain loop with the current zoom factor.
- **Release Loop** shows the entire release loop.
- **Release Loop Start** shows the start marker of the release loop with the current zoom factor.
- **Release Loop End** shows the end marker of the release loop with the current zoom factor.

#### NOTE

If the view range cannot be set to the specified loop marker or range because the sample does not contain the required loop, it is set to the last stored settings for that zone. If no view range settings were stored, the entire sample is displayed.

---

#### RELATED LINKS

[Options Editor](#) on page 41

## Markers

Markers specify important positions or sections in a sample.



You can move markers by dragging them in the graphical display. Which markers are shown in the display depend on which tab is selected.

#### Sample Start

Defines where the sample starts to play when a zone is triggered. Audio before this marker is skipped.

#### Sample End

Defines where the sample stops playing. Audio after this marker is ignored.

#### Sustain Loop Start

Defines where the sustain loop starts.



### Sustain Loop End

Defines where the sustain loop ends. When this marker is reached, playback jumps back to the sustain loop start.

### Release Loop Start

Defines where the release loop starts.

### Release Loop End

Defines where the release loop ends. When this marker is reached, playback jumps back to the release loop start.

### Release Start

This marker defines the position at which playback starts when a note-off message is received. This allows for a realistic release note-off behavior without the necessity of using extra release samples. To avoid unwanted clicks when jumping to the release marker, you can set a crossfade time and curvature on the **Loop** tab in the parameter section.

### Sample Start Range

Defines the attack phase of a sample, which can be used for the modulation of the sample start.

#### RELATED LINKS

[Sample Oscillator Section](#) on page 128

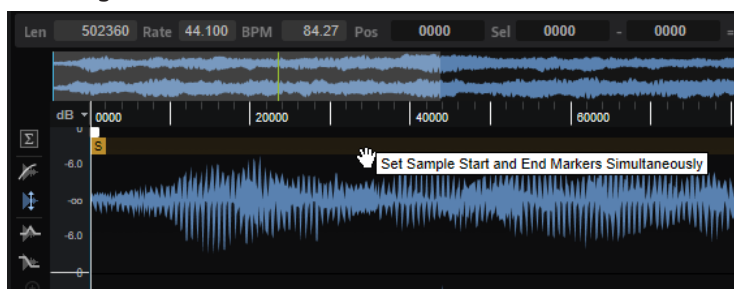
## Setting up the Sample Range

You define the sample range with the **Sample Start** and **Sample End** markers in the waveform display.

---

#### CHOICES

- To set the sample start, drag the **Sample Start** marker.
- To set the sample end, drag the **Sample End** marker.
- To move sample start and end at the same time, position the mouse pointer between the **Sample Start** and **Sample End** markers at the height of the marker flags, and drag to the left or right.



## Zooming

- To zoom in/out on the time and level axis, use the horizontal and vertical zoom sliders.
- The three buttons to the right of the horizontal zoom slider allow you to zoom to the start, the end, and to the full range.



Depending on the situation, these options refer to the sample, the selection, or a loop. Click several times to increase the zoom level.

- To toggle between full zoom and the previous zoom setting, click the **A** button to the right of the horizontal zoom slider.
- To zoom in/out on the locator position, press **G** and **H**.
- You can click and drag in the ruler to zoom in/out on the position where you have clicked.
- Resize the rectangle in the overview line to zoom to this range.
- Use the options on the **Zoom** submenu of the context menu.

## Editing Samples in an External Editor

HALion allows you to use an external sample editor to perform destructive offline editing on a sample, for example applying EQs, filtering, or denoising.

### NOTE

Not all sample editors provide the same functionality, that is, certain features, like transferring sample loop markers, are not always possible. To get the best results, use Steinberg's WaveLab.

---

To load the current sample in an external editor, do one of the following:

- Right-click in the waveform of the sample, and select **Sample > Open in External Editor**.
- On the **Sample Editor** toolbar, click **Open in External Editor**.

The external sample editor is launched and the sample is transferred.

### NOTE

This function is only available if an external editor is specified in the **Edit** section in the **Options Editor**.

---

HALion creates a copy of the sample and writes it to a temporary folder. This folder is specified in the **Options Editor**. If no folder is specified, the temporary folder of the operating system is used. Changes in the external editor are made to the copy of the sample.

When you save the sample in the external editor, HALion recognizes that the temporary file has changed and lets you update the corresponding sample.

### NOTE

Sample start/end and release markers cannot be transferred to an external editor.

---

If a sample is referenced by several zones, changes to the sample are reflected in all these zones.

### RELATED LINKS

[Edit Section](#) on page 44

## Creating Loops

You can specify two independent loops, one for the sustain phase and one for the release phase.

The loop settings can be edited using the toolbar options and the handles in the waveform display, but they are also available on the **Loop** tab in the parameters section.

## Setting up a Loop

To set up the sustain and the release loop, you can set the start and end positions manually and/or use the functions to automatically detect suitable loop positions. For a smooth loop, you must find positions at which the loop end can be continued naturally at the loop start.

---

### PROCEDURE

1. On the **Loop** tab, select a loop mode for the sustain loop and the release loop.  
The corresponding markers are shown in the waveform display.
2. Activate **Edit Loop** on the toolbar.
3. Do one of the following:
  - Set the start and end markers for the loop by dragging the marker handles.
  - Press **Shift** and drag the audio before or after the loop end marker to adjust the end or the start position, respectively.
  - To move loop start and end at the same time, position the mouse pointer between the **Loop Start** and **Loop End** markers at the height of the marker flags, and drag to the left or right.



- To automatically detect suitable loop start and end positions, click **Find Previous Loop Start/Find Next Loop Start** or **Find Previous Loop End/Find Next Loop End**.

The loop markers are set accordingly.

### NOTE

The **Loop Transition**, **Threshold**, and **Loop Score** settings influence the marker detection features.

---

## Edit Loop

If **Edit Loop** is activated, the editor shows the looped region as overlay with the original sample in the background. This is useful to fine-tune and adjust a loop. The waveform is updated to reflect the result of your loop settings.

To better see how loop start and end are correlating, a part of the waveform is displayed in blue on top of the loop. This part is taken from an area around the loop start (+/- the loop length) and then shifted to the loop end. The better both waveforms correspond, the smoother the sound of the loop.

## Setting Up Loop Crossfades

Loop crossfades allow for smoother loops.

---

### PROCEDURE

1. Activate **Edit Loop** on the toolbar.  
Crossfade handles are displayed in the waveform display.

2. Click **Sustain/Release Loop** on the toolbar to select whether you want to edit the sustain loop or the release loop.
  3. Drag the crossfade handles or enter the crossfade range numerically in the parameter section.
  4. To see the effect of the crossfade, activate **Show Resulting Loop Crossfade** on the toolbar. The resulting waveform is displayed in red.
  5. Adjust the crossfade curve by dragging the middle of the fade curve up or down.
- 

## Creating a Loop from the Selection

You can use a selection range as the basis for a loop.

---

### PROCEDURE

1. Activate **Play Selection Looped** on the toolbar.
  2. Click the **Play Sample** button on the toolbar.
  3. Adjust the selection until you are satisfied with the loop.
  4. Right-click in the waveform display, open the **Selection** submenu, and select **Set Sustain Loop to Selection** or **Set Release Loop to Selection**.
- 

## Creating Slices Automatically

You can slice samples in the **Sample Editor**. This allows you to play them back in sync with the host application, for example.

---

### PROCEDURE

1. In the **Program Tree**, select the sample zone that you want to slice.
  2. In the **Sample Editor**, select the **Slice** tab.
  3. Adjust the **Threshold**, **Sensitivity**, **Min Length**, and **Grid Catch** parameters to set the slice markers automatically.
  4. If necessary, move, add, or delete slice markers manually.  
You can add and delete slice markers by **Alt/Opt**-clicking in the editor.
  5. To create slices, click **Apply** in the upper right corner of the parameter section.
- 

### RESULT

HALion creates zones from the slices. These zones are added to the **Program Tree**, together with a slice player that contains the MIDI sequence to play back the sliced loop.

### NOTE

- After slicing the sample, you can still edit the slice markers manually, but you cannot use the automatic slice detection.
  - If you change slice markers after creating slices, the sample start and end markers of the affected zones in the **Program Tree** are modified. If you add slice markers, new zones are added. If you remove slice markers, the corresponding zones are removed.
  - If you revert the slicing of a loop, all created zones are deleted and any replacement samples are discarded.
-

## Modifying Start and End of Slices

You can shorten a slice without changing the position of the adjacent slice markers.

---

### PROCEDURE

- Select the **Main** tab and drag the corresponding marker.  
If you modify the end marker, the following slice start marker turns blue. If you modify the sample start marker of a slice, this marker turns blue.

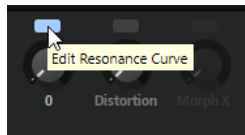
### NOTE

Changing the start or end markers does not influence the timing of the note events of the MIDI phrase that triggers the loop.

---

## Parameter Curve Editing

If you click the button above a control, you can view and edit the corresponding parameter curve in the waveform display.



### NOTE

Only one parameter curve can be shown at a time.

---

## Sample Replacement

You can replace samples in the **Sample Editor** and in the **Program Tree**.

For example, this allows you to replace the snare drum in a drum loop.

- In the **Sample Editor**, you can replace the entire sample or individual slices using the **Load/Replace Sample** button.
- In the **Program Tree**, drag the new sample or sample zone onto the sample or zone that you want to replace.

If you replace the sample, zone parameters like filter settings, etc. remain unaffected. If you replace the entire zone, the sample and all zone parameters are replaced.

To replace an individual slice, drag the new sample or zone onto the slice that you want to replace.

### NOTE

If the replacement sample is longer than the original, change the **Playback Mode** of the zone to **One-Shot**, to make sure that the sample is played until the end.

---

# Wavetable Synthesis

HALion's wavetable synthesis offers you a wide range of possibilities, from the re-synthesis of samples to the creation of entirely new sounds.

In classic subtractive synthesis, static harmonic oscillator waveforms are sent through filters and amplifiers, where the sound is shaped. In wavetable synthesis, you can extract specific portions from samples and align them to form a wavetable. The waves in the wavetable are played back one after the other to create the sound progression. You can shape the sound in the same manner as in subtractive synthesis, by using filters, amplifiers, etc.

The **Wavetable Editor** is where you create wavetables, that is, where you load samples, insert wave extraction markers to add the waves, work on the spectrum of the waves, create the wavetable envelope, and specify the order of the waves in the wavetable.

HALion allows you to create your own wavetables by extracting single-cycle waves from samples. Single-cycle means that a wave is exactly one period long. The sophisticated sample analysis functions in the **Wavetable Editor** help you to find good positions for wave extraction.

HALion supports multi-channel wavetables with up to 6 channels (5.1) and allows you to define whether all channels, a specific channel, or the sum of all channels are to be used to extract waves. This means that you can combine waves of different channel widths in one wavetable. Zone playback always uses the maximum channel width of all waves in the wavetable. The 2D and 3D wave displays also display the maximum channel width. For example, if at least one wave is stereo, they display two channels. Programs that use multi-channel wavetables with more than two channels must be assigned to the surround output of HALion.

When HALion extracts a wave from a sample, a wavetable envelope is created. You can edit the envelope via the **Envelope** tab. This envelope is part of the wavetable, which means that you can always use the wavetable as it is, without having to assign and set up a new envelope.

The order of the waves in the wavetable determines how the sound evolves when you modulate the position. A wavetable can contain up to 1024 waves that can be extracted from different samples. A series of consecutive waves from the same sample is called a sequence. A wavetable can contain multiple sequences from different samples.

In the **Zone Editor** for a wavetable zone, in the **Wavetable** section, you can find the play parameters for wavetables. This is where you specify which oscillators to use and where to make settings for them.

You can use the **Speed** parameter to automatically modulate the wavetable position, or you can modulate it manually in the modulation matrix.

## RELATED LINKS

[Editing Zones](#) on page 115

[Wavetable Section](#) on page 146

## Wavetable Editor

The **Wavetable Editor** allows you to create wavetables by extracting waves from samples.



The **Osc 1** and **Osc 2** tabs in the top section of the **Wavetable Editor** allow you to switch between the settings for the two oscillators.

The upper part of the window with the **Sample**, **3D Map**, **2D Wave**, and **Analyzer** tabs is used for the analysis and the creation of wavetables.

The lower part of the window with the **Spectrum**, **Envelope**, and **Filter** tabs allows you to edit the wavetable.

At the bottom of the window, an overview of the wavetable displays the extracted waves.

### RELATED LINKS

[Sample Tab](#) on page 249

[3D Map, 2D Wave, and Analyzer Tabs](#) on page 255

[Wavetable Envelope](#) on page 256

[Spectrum Tab](#) on page 258

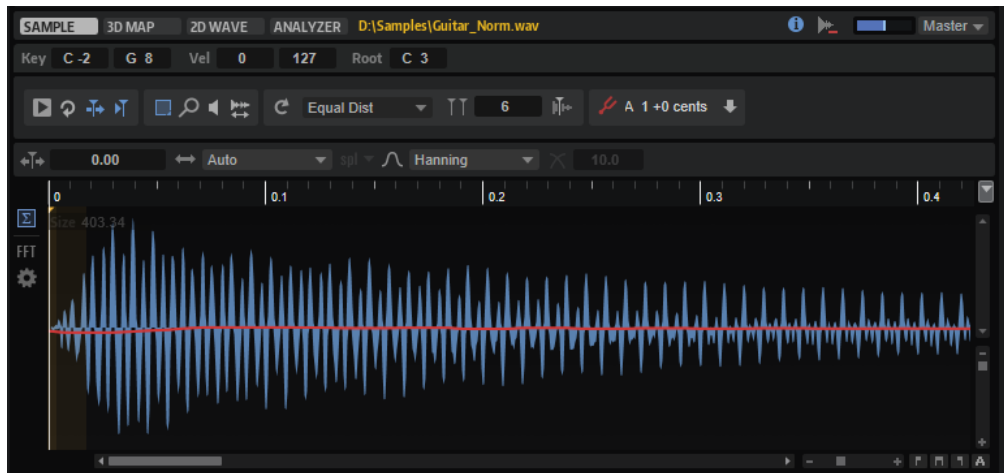
[Filter Tab](#) on page 262

[Wavetable Overview](#) on page 265

## Sample Tab

The **Sample** tab contains the sample editing parameters and shows the sample waveform.

The file path and name of the sample are displayed above the sample display. If more than one sample is loaded, the file path serves as a menu to select the sample to edit and display. If you select a sample, the waves that belong to it are selected in the wavetable.



### Show/Hide Zone Info Bar

Allows you to show/hide the info bar containing the zone parameters.

### Strip Wavetable Samples

Allows you to remove information about used samples from the wavetable editor. When creating wavetables that are based on samples, the reference paths to the used samples are stored with the presets. This allows you to return to a wavetable and modify some of the wave markers. When making presets available to other users, you can either add all source samples to the VST container, which allows others to modify them, or you can provide the presets with the final wavetables only by activating this option.

### Preview Volume/Output for Preview

Allow you to specify the preview volume and output.

## Zone Info Bar



- To show/hide the zone info bar, click **Show/Hide Zone Info Bar**  on the toolbar.

### Key Range

With the **Low Key** and **High Key** value fields, you can set the key range for the selected zone.

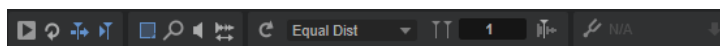
### Velocity Range

With the **Low Velocity** and **High Velocity** value fields, you can set the velocity range for the selected zone.

### Root Key

The root key determines the original pitch of a zone, that is, the key on which the zone is played without being transposed.

## Toolbar



### Play Sample

Plays back the original sample.

You can specify the playback volume and output with the **Preview Volume** and **Output for Preview** controls in the upper right corner of the editor.



### Play Selection Looped

Activate this button to play back the selection in a loop.

### Auto-Scroll

If this button is activated, the waveform display is scrolled during playback, keeping the playback cursor visible.

### Follow Sample Playback

Activate this button to see a playback cursor when triggering a sample via MIDI.

### Range Selection Tool

Click and drag with this tool to create a selection.

### Zoom Tool

If this tool is selected, you can click in the waveform to zoom in on the position where you click.

### Play Tool

If this tool is selected, you can click in the waveform to start playback. The sample is played back from this position until you release the mouse button.

### Scrub Tool

If this tool is selected, you can click in the waveform and drag sideways to play back the audio. The playback direction and speed depend on how fast and how far you move the mouse to the left or to the right from the position where you clicked.

### Create Wavetable

Analyzes the sample and updates the wavetable, according to the **Wavetable Creation Mode** setting.

### Wavetable Creation Mode

- **Equal Distance** – the wavetable markers are equally distributed over the sample.
- **Exponential** – the distances between the wavetable markers increase over the length of the sample.
- **Spectral** – the entire sample is analyzed, and wavetable markers are inserted where the change in the spectrum exceeds the set threshold.
- **Spectral Voiced** – the entire sample is analyzed, and wavetable markers are inserted where the change in the spectrum exceeds the set threshold if a pitch is detected at this position.
- **Overlap-Add** – wavetable markers are set so that the analysis windows overlap.

#### NOTE

The wavetable is created automatically each time that you change the parameter settings.

---

### Number of Waves

Sets the number of waves in the sample display. You can enter the number of waves that you want to use in the value field.

#### NOTE

This parameter is only available for the **Wavetable Creation Mode** settings **Equal Distance** and **Exponential**.

---

### Include Window in Range

If this button is activated, the wavetable markers are set in such a way that the analysis windows always encompasses the full range of the sample.

This is useful if you want to import wavetable samples that contain equally sized segments, each segment representing a waveform.

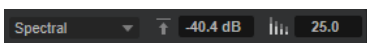
#### NOTE

This option is only available for the **Wavetable Creation Mode** settings **Equal Dist**, **Exponential**, and **Overlap-Add**.

---

### Wavetable Creation Threshold/Wavetable Creation Sensitivity

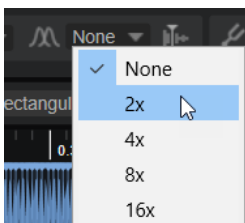
These parameters are available for the **Wavetable Creation Mode** settings **Spectral** and **Spectral Voiced**.



- **Wavetable Creation Threshold** sets the minimum level for waves to be created.
- **Wavetable Creation Sensitivity** sets the sensitivity for the analysis of spectral changes. The higher the sensitivity, the more waves are created.

### Wavetable Creation Overlap

Sets the overlap of analysis windows. Higher values allow for a more accurate analysis of the signal but create a larger number of markers.



#### NOTE

This parameter is only available for the **Wavetable Creation Mode** setting **Overlap-Add**.

---

### Show Pitch Detection Curve

If this button is activated, the pitch detection curve is displayed on the waveform. This curve shows you where in a sample the pitch can be detected properly.

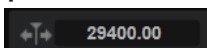
### Detected Pitch

The detected pitch at the current marker position.

### Transfer Pitch to Root Key

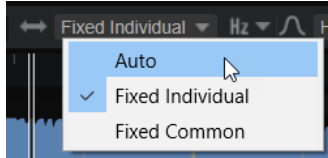
Sets the detected pitch as the root key for the sample.

### Sample Position



The position of the selected marker in the sample.

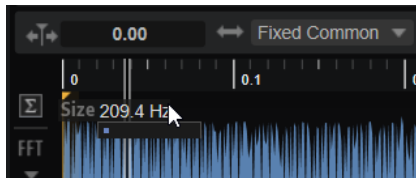
### Window Size Mode



Specifies how the windows size for the markers is set.

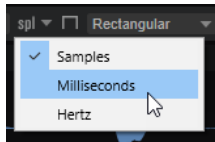
- With **Auto** selected, the size is determined by the frequency that was calculated by the pitch detection. In most cases, this will result in the most appropriate sizes for each marker. The sizes are displayed next to the selected marker.
- **Fixed Individual** mode allows you to manually set the window size for each marker individually for each audio channel.
- **Fixed Common** mode allows you to manually set the windows size for each marker for all channels together.

For example, **Fixed Individual** and **Fixed Common** are useful if the pitch detection function cannot detect the pitches correctly but you know the pitch of the sample. In this case, you can enter the window size manually in the value field next to each marker.



### Window Size Format

Allows you to specify the format for editing the window size. You can choose from **Samples**, **Milliseconds**, or **Hertz**.



#### NOTE

If **Window Size Mode** is set to **Auto**, this option is not available.

### Window Type

Allows you to select the window type. This affects the shape of the window, which in turn influences the frequency resolution. This parameter also determines the amount of suppression of noise artifacts during the analysis.

The window types on the menu are sorted from the best frequency resolution with the lowest artifact suppression (**Rectangle**) to the lowest frequency resolution with best artifact suppression (**Blackman-Harris**).

Try out different **Window Type** settings to find the overall frequency resolution and artifact suppression that suits your work.

### Window Crossfade



Sets the amount of crossfade at the beginning and end of the window.

NOTE

This option is only available for the **Rectangular** window type.

---

## Waveform Display

To the left of the display, you can specify which channels to show, and you can add a spectrogram to the waveform display.

### Channel configuration pop-up menu



On the **Channel Configuration** pop-up menu, you can specify which channel or channels to use for wave extraction. You can also select the sum of all channels. The channel setting is saved for each extracted wave. This way, you can extract one wave from the left channel and another from the right channel, for example. If you select a single channel, a mono wave is created.


The icon displayed on the button indicates the current setting.

NOTE

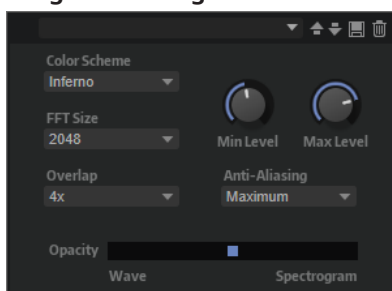
Which channel options are available depends on the sample file.

---

## Show Spectrogram

The sample display can either show the sample waveform, the spectrogram, or a blend of both. Activate **Show Spectrogram**  if you are searching for the ideal sample start or release marker positions, for example. This allows you to see more precisely where the sample starts or where overtones have faded out.

### Spectrogram Settings



- **Color Scheme** allows you to choose a color scheme.
- **FFT Size** sets the block size of the window that is used for the analysis. This allows you to adjust the trade-off between temporal resolution and frequency resolution. If you specify a higher value, more frequencies are analyzed, but they are located less accurately within the time domain.
- **Overlap** sets the number of overlapping FFT windows. Increasing the overlap can be used to reduce analysis limitations of the FFT windows, which can lead to a loss of details, such as transients.
- **Min Level** sets the minimum value of the scale.
- **Max Level** sets the maximum value of the scale.

- **Anti-Aliasing** can be used to improve the display quality.
- The **Opacity** slider allows you to seamlessly blend between sample and FFT display.

## Zooming in the Wavetable Editor

- To zoom in/out on the time and level axis, use the horizontal and vertical zoom sliders.



- To zoom in or out, click the + or - buttons on the scrollbars.
- To switch between full zoom and the previous zoom setting, click the **A** button to the right of the horizontal zoom slider.
- To zoom in or out on the current position, click in the timeline, and drag up or down.
- To zoom to a specific region, hold down **Alt/Opt**, and click and drag over this region.
- The three buttons to the right of the horizontal zoom slider allow you to zoom to the start, to the full range or the selection, and to the end.



Click several times to increase the zoom level.

## 3D Map, 2D Wave, and Analyzer Tabs

Allows you to choose from different display options of the wavetable.

### Channel Selector

Allows you to select a specific channel or the sum of all channels. By default, the display shows all available channels, that is, one for mono wavetables, two for stereo wavetables, etc.

### Show 2D Wave

Displays a single cycle of the current waveform. The shape of the waveform changes as the sound evolves, reflecting the waveform at the current position in the wavetable. If **Multi-Oscillator** is activated in the **Wavetable** section of the **Zone Editor**, the view displays the waveform of the individual oscillators.

### Show 3D Wavetable Map

Displays a topographic map of the entire wavetable. The current position in the wavetable is indicated by a line. If **Multi-Oscillator** is activated in the **Wavetable** section of the **Zone Editor**, the view indicates the position of the individual oscillators.

- To change the viewing angle, drag the 3D map.
- To zoom in and out, use the scroll wheel of your mouse.

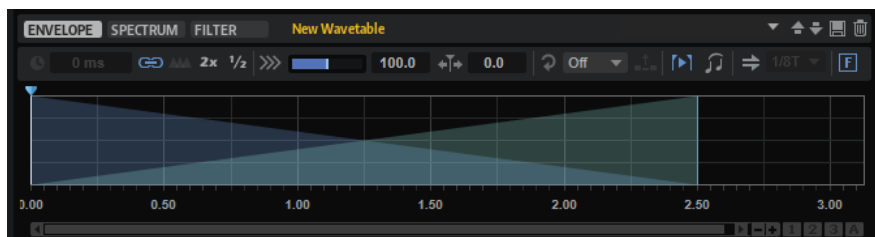
### Show Spectrum Analyzer

Displays the frequency spectrum at the oscillator output. This allows you to see how the spectrum evolves during the playback of a note, that is, you can see the influence of the oscillator settings on the frequency spectrum in real time. This can be useful to see how the spectral filter or the formant filter affects the spectrum, for example.

## Wavetable Envelope

Via the **Envelope** tab, you can set up the wavetable envelope. This envelope determines how the waves in a wavetable play back.

An envelope can consist of a number of segments that can be based on different waves. The order of the segments in the wavetable envelope matches the order of the waves in the wavetable. Between these segments, crossfades are inserted to create smooth transitions. The form of the crossfades is shown in the display. The fade-in and the fade-out of the selected segment are highlighted. The vertical line in the display marks the position where the wave can be heard alone, that is, without crossfade from adjacent waves. When you play a note, the envelope starts from the position cursor.



### Time of Segment

If you want to set an envelope segment to a specific time, enter the value in this field.

You can adjust the **Time** of several selected segments at the same time.

### Link Envelope Times to Marker Positions

If this button is activated, the chronological order of the envelope segments corresponds to the chronological order of the markers in the sample. New markers are added to the wavetable envelope according to their position in the sample. If you change the position of a marker in the sample, the position and time of the corresponding envelope segment also change.

If this button is deactivated, you can extract a different spectrum from a different position in the sample without changing the envelope.

#### NOTE

- If you adjust the envelope or change the order of the waves while **Link Envelope Times to Marker Positions** is activated, this option is automatically deactivated, because the markers and the envelope are not in sync anymore.
- If the wavetable consists of multiple sequences, this option is remembered separately for each sequence.

### Set Equal Times

The duration of the selected envelope segments is adjusted to equal times, that is, to the arithmetic mean of the durations of the segments.

#### NOTE

This function can only be used if three or more consecutive segments are selected.

### Double Envelope Times

For the selected envelope segments, the times are doubled.

### Halve Envelope Times

For the selected envelope segments, the times are halved.

### Speed

Determines the rate at which the envelope plays through the wavetables. At +100%, the envelope plays back at its original speed. A value of +50% corresponds to half the original speed, and +200% to twice the original speed, for example.

This parameter is unipolar.

### Position

Determines the position in the envelope where playback starts.

### Loop Mode

- **Off:** If **Playback Direction** is set to a positive value, the wavetable plays from the position cursor to the end.  
If **Playback Direction** is set to a negative value, the wavetable plays from the position cursor to the start.
- **On:** Depending on the **Playback Direction** setting, the wavetable plays forward or backward in a loop.
- **Alt:** The wavetable plays in an alternate loop, that is, the loop is alternately played forward and backward. The first direction depends on the **Playback Direction** setting.

### Loop Until Release

If this button is activated, the loop is repeated until you release the key on the keyboard.

If this button is deactivated, waves outside the loop are not played when you release the key.

### Hold Last Spectrum

Activate **Hold Last Spectrum** to keep the last spectrum once sample playback reaches the sample end or sample start, depending on the playback direction.

### Legato

If **Legato** is deactivated, each note starts playback from the position cursor.

If **Legato** is activated, the first note starts playback from the position cursor, and any subsequent notes start from the current playback position, for as long as the first note is held.

This allows you to add more and more notes, all synchronized with respect to their playback position. As long as you play notes legato, the oscillator continues to run, which allows you to switch between chords without restarting the oscillator.

### Sync To Host Tempo

You can synchronize the envelope to the tempo of your host application. This allows you to set envelope times that relate to musical time intervals.

If **Sync** is activated, a grid appears in the graphical envelope editor. From the **Grid** pop-up menu to the right of the **Sync** button, you can select a note value. This sets the resolution of the grid.

For example, if you specify a 1/4 note value, the envelope segments snap to 1/4 note steps. If the **T** button is activated, triplet note values are used.

You can also manually enter note values and triplets in the value field. The **Time** field of a segment displays times in fractions of beats. The fraction is always reduced to the smallest possible value. For example, 2/16 is displayed as 1/8. Envelope segments that do not exactly match a note value show the closest note value.

### Fixed Mode

- If **Fixed Mode** is activated and you move selected segments on the time axis, only these segments are moved.
- If **Fixed Mode** is deactivated, all segments that follow the edited segments are also moved.

#### NOTE

**Position**, **Speed**, and **Direction** of wavetable oscillators 1 and 2 can be modulated in the modulation matrix.

---

## Editing the Envelope

- To move the position cursor, drag the blue handle above the envelope.
- To change the length of a segment, drag its right border.
- To adjust the shape of the crossfade between two waves, drag the crossfade lines of the segment. This way, you can change the character of the crossfade from linear to exponential/logarithmic behavior.
- To reset the crossfade to linear, **Ctrl/Cmd**-click it.

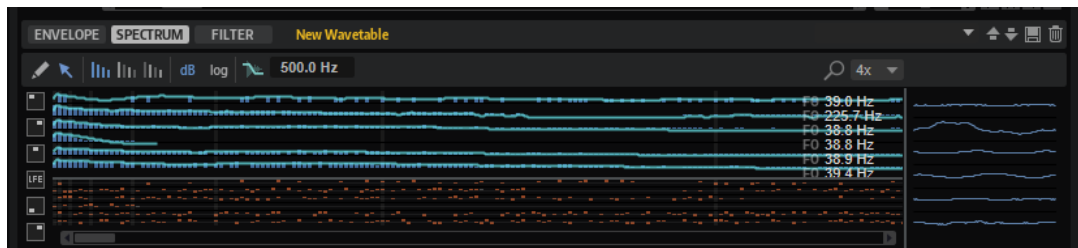
#### NOTE

When you hover the mouse pointer over the position cursor, a tooltip displays the time of the wavetable position in milliseconds.

---

## Spectrum Tab

The **Spectrum** tab shows the amplitude and the phase spectrum of the extracted wave, that is, the amplitude and the phase for each harmonic.



The lowest harmonic is displayed on the left, the highest harmonic on the right.

The harmonics in the spectrum are represented by blue and orange bars. Blue bars represent the amplitude of the harmonics, that is, the magnitude spectrum. Orange bars represent the phase of the harmonics, that is, the phase spectrum. If the magnitude of a harmonic is zero, the corresponding phase is grayed out. You can obtain information on a particular harmonic by moving the mouse over its bar.

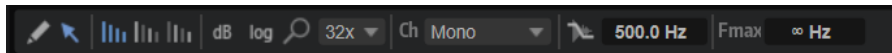
On the right, the frequency of the fundamental for each channel of the wave is displayed in Hz. This value is set automatically when a wave is extracted from a sample and represents the original pitch. If you created the spectrum manually, either by drawing or by inserting one of the basic waves from the **Create New Wave** menu, the value is set to 20 Hz. If no extracted pitch information is available, the fundamental allows you to determine which harmonic represents which frequency. For the default value of 20 Hz, the 1st harmonic is at 20 Hz, the second one at 40 Hz, the third one at 60 Hz, and so on. HALion provides 1024 harmonics, which means that you can create frequencies up to 20.480 Hz.



The number of editable harmonics in the spectrum view depends on the fundamental and on the setting of the **Maximum Frequency** parameter.

You can set the spectrums of a multi-channel wave for each individual channel or for all channels.

## Toolbar



### Draw Tool



Allows you to change the spectrum by drawing with the mouse. The resulting wave is displayed on the right.

- To draw in the magnitude or the phase spectrum, click in the display, and drag.
- To draw a line, hold down **Alt/Opt**, and drag.
- To adjust a single harmonic, click it, hold down **Shift**, and drag up/down.
- To set the magnitude or the phase of a harmonic to zero, **Ctrl/Cmd**-click it.  
To set the magnitude or phase of all harmonics to zero, hold down **Shift - Ctrl/Cmd**, and click.

### NOTE

The setting of the **Phase Mode** determines the impact of the **Draw**.

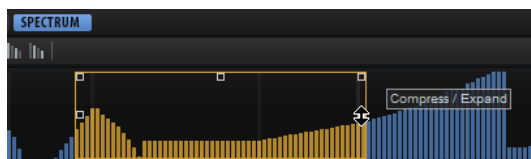
- If you activate **Keep Original Phases**, only the focused wave is affected.
- If you activate **Align Phases** and adjust the phase of the focused wave, the subsequent waves are also affected.
- If you activate **Reset Phases to Zero**, you cannot adjust the phase spectrum with this tool.

### Selection Tool



Allows you to create range selections in the magnitude spectrum.

- Drag the tool to make a selection. To select multiple channels of a multi-channel wave, drag the tool across the channels that you want to edit. Click the channel selector on the left to set the focus on a particular channel.



After making a selection, you can use the handles of the rectangle to perform the following editing functions:

- To tilt the left part of the harmonic curve, use the handle in the top left corner. This allows you to tilt the harmonics at the start of the selection upwards or downwards.  
Press **Ctrl/Cmd** to tilt the harmonics using a shelving filter curve instead of the linear curve.
- To tilt the right part of the harmonic curve, use the handle in the top right corner. This allows you to tilt the harmonics at the end of the selection upwards or downwards.

Press **Ctrl/Cmd** to tilt the harmonics using a shelving filter curve instead of the linear curve.

- To scale the harmonics, use the handle in the center of the top border. This allows you to raise or lower the harmonic values of the curve in percent.

Press **Ctrl/Cmd** to scale the harmonics with a bell curve.

Press **Shift** to offset the harmonics.

- To scale the harmonics around their relative center, use the handle in the middle of the left and right borders. This allows you to raise or lower the harmonic values horizontally around the center of the selection.
- To select all harmonics of the same pitch in all octaves that are higher than the current octave, double-click a harmonic.

#### NOTE

This automatically switches to **All Harmonics** mode.




#### NOTE

Only non-zero values can be edited with the Selection tool.

### Harmonics



With the **Harmonics** buttons, you can choose whether to edit all harmonics or to apply your editing exclusively to even or to odd harmonics.

- Select **All Harmonics**  to edit all harmonics.
- Select **Odd Harmonics**  to edit only the odd-numbered harmonics.
- Select **Even Harmonics**  to edit only the even-numbered harmonics.

### Level in dB



If this button is activated, you can set the level in dB.

If this button is deactivated, you can adjust the level from minimum to maximum within a range of 0 to 100%.

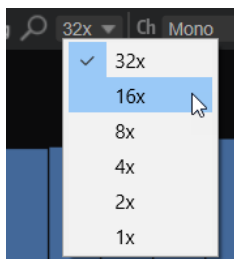
### Linear/Logarithmic Frequency Display



Allows you to switch between a linear and a logarithmic frequency display.

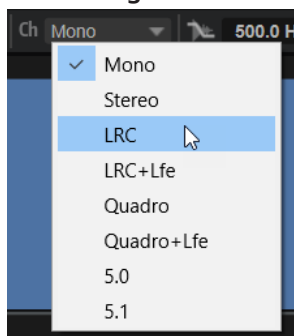
The logarithmic frequency display takes up less space for showing the entire frequency range than the linear frequency display. It is useful for editing a range of harmonics with the **Selection** tool. For individual adjustments to the higher harmonics, we recommend to use the linear frequency display.

### Zoom



Allows you to choose from six predefined zoom factors.

### Channel Configuration



Wavetable synthesis in HALion supports multi-channel formats up to 5.1, which means that the wavetables can contain spectrums of up to 6 channels for each wave. The **Channel Configuration** parameter allows you to change the channel configuration of the waves.

Reducing the width results in unused channels, while expanding the width adds empty channels. For example, if you set the configuration of a stereo wave to mono, only the left channel is used.

Changing this parameter alters how the channels are assigned to the six internal bus channels. For example, **Quadro** is assigned to the channels 1,2,5, and 6.

Waves that you added using the **Add New Wave**  button can also be set to another channel configuration.

### Show Spectral Envelope

Allows you to show/hide the spectral envelope, a smoothed curve of the harmonics' levels which serves as a base reference curve for the formant filter.

### Formant Resolution

Allows you to specify how closely you want the envelope to follow the levels across the spectrum. Higher values result in a smoother curve and less pronounced formants. Lower values cause the curve to follow the levels more directly, resulting in a more detailed formant curve.

### Maximum Frequency

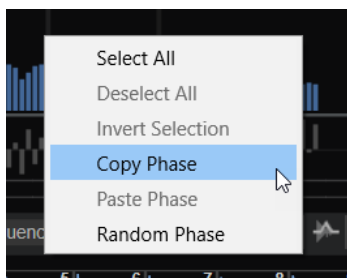
Allows you to limit the wavetable playback to the frequency range that is effectively used in the wave. This way, it is not necessary to compute the full spectrum, which can reduce the required processing power. The setting can be adjusted for each wave individually.

When you reduce this parameter, the number of editable harmonics in the spectrum view is adjusted accordingly.

### Phase Spectrum Editing

You can use the **Draw Tool** to edit the phase spectrum of a wave in the same way as you edit the level of the harmonics. However, this editing method is quite abstract. While it is relatively easy to predict the effects of increasing or decreasing the level of a harmonic, it is much harder to do so with regard to the effects of changing the phase. In most cases, the phases of the harmonics must transition smoothly from one wave to the next. In situations where this is difficult to achieve, you can copy and paste the phase spectrum from one wave to another or to all waves within a wavetable. This way, phase alignment becomes much easier, and you only have to adjust the level transitions between the waves. As an alternative to selecting the phase spectrum of a wave, you can also randomize the phase spectrum.

## Context Menu



### Select All

Selects all harmonics.

### Deselect All

Deselects all harmonics.

### Invert Selection

Selects all harmonics that were previously not selected, and deselects all harmonics that were previously selected.

### Copy Phase

Copies the phase spectrum of the focused wave to the clipboard.

### Paste Phase

Pastes the phase spectrum from the clipboard to the selected waves.

### Random Phase

Randomizes the phase spectrum of the selected waves. The same random phase spectrum is applied to all channels, to maintain a correlated stereo or surround image.

## RELATED LINKS

[Wavetable Overview](#) on page 265

## Filter Tab

The **Filter** tab allows you to edit the spectral filter that is integrated in the wavetable oscillator and to apply this filter to all or to specific waves of the wavetable.

You can apply individual filters to each wave or apply the same filter to the entire wavetable.



### Filter On/Off

Activates/Deactivates the spectral filter.

### Create Filter

Creates a filter for the selected waves.

If you create a filter for one wave of the wavetable, this filter is applied to all waves.

#### EXAMPLE

- To apply filters exclusively to specific waves, select the waves, click **Create Filter**, and edit the filter. Waves without an own filter are played back with blended filters of the preceding and subsequent waves.
  - To apply one filter to the entire wavetable, select a single wave, click **Create Filter**, and edit the filter. If no filter is specified for any of the other waves in the wavetable, this filter affects all waves.
- 

#### Delete Filter

Deletes the filter.

#### Node

Displays the selected node. You can use the arrow buttons to switch between nodes.

#### Frequency

Sets the frequency of the selected node.

#### Gain

Sets the gain of the selected node.

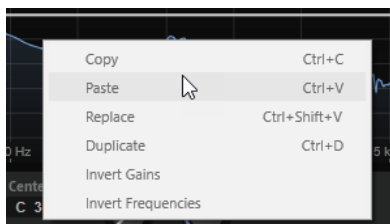
#### dB Range

The scrollbar on the right side allows you to define the dB range in which the filter curve can be adjusted. By default, it is set to the maximum range of +20 dB to 120 dB. This allows you to limit the range, for example, if you want to make very subtle adjustments within a range of +/-12 dB.



Drag the upper or lower edge to change the maximum value or the minimum value of the range. When the range is limited, you can also drag the middle of the scrollbar to change both at the same time.

#### Context Menu



#### Copy

Copies the selected nodes to the clipboard.

#### Paste

Pastes the copied nodes at the insert position.

#### Replace

Replaces the selected nodes with the nodes from the clipboard.

### Duplicate

Duplicates the selected nodes.

### Invert Gains

Flips the **Gain** values of the nodes around the vertical center of the selection. This way, you can turn a filter bump into a filter dip, for example.

### Invert Frequencies

Flips the nodes around the horizontal center of the selection. This way, you can mirror the symmetry of an asymmetrical filter shape, for example, to turn a low-pass filter into a high-pass filter.

## Editing the Filter Curve

By adding nodes and moving them, you can create your own filter curves.

---

### CHOICES

- To add a node, double-click in the graphical display.
- To remove a node, double-click it.
- To move a node, drag it to another position.

#### NOTE

If multiple nodes are selected, they are moved together.

---

- To change the frequency of a node, select it, and enter a new value in the **Frequency** field. This is the same as dragging the node horizontally.

#### NOTE

If multiple nodes are selected, they are moved relative to each other, that is, the distances between the nodes are maintained.

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- To change the gain of a node, select it, and enter a new value in the **Gain** field. This is the same as dragging the node vertically.

#### NOTE

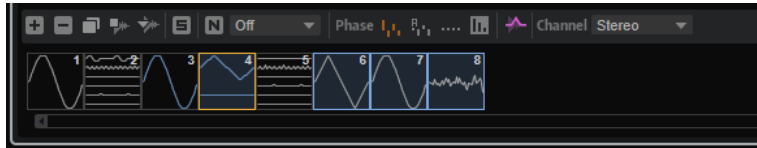
If multiple nodes are selected, they are set to the same gain.

---

- To copy one or several nodes, select the nodes, open the context menu, and select **Copy**. To paste the nodes from the clipboard, click at the position where you want to insert the nodes, open the context menu, and select **Paste**. To replace nodes with the nodes copied to the clipboard, select the nodes that you want to replace, open the context menu, and select **Replace**.
  - To flip the **Gain** values of the nodes around the vertical center of the selection, open the context menu, and select **Invert Gains**.
  - To flip the nodes around the horizontal center of the selection, open the context menu, and select **Invert Frequencies**.
-

## Wavetable Overview

At the bottom of the **Wavetable Editor**, you can find the wavetable overview.



The selected waves are marked in blue. The focused wave is marked in orange.

### NOTE

A wavetable can consist of up to 1024 waves.

---

### Add New Wave



Allows you to create a new wave of the selected type and insert it into the wavetable to the right of the selected wave.

### Remove Wave



Deletes the selected waves.

### NOTE

If you delete all waves from the wavetable, the last sample that was visible in the waveform display is kept, allowing you to restart from scratch.

---

### Duplicate Wave



Duplicates the selected waves.

### Insert Wave from Sample



Opens a file dialog where you can load a new sample. This also adds a new wave to the wavetable.

### Replace Sample



Allows you to replace all waves of the visible markers in the sample.

### NOTE

If other waves of the same sample are used in other wave sequences, these waves are not replaced.

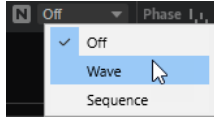
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### Solo Focused Wave



Solos the focused wave. This bypasses the position and speed settings, and you hear only the selected wave.

### Normalize Mode



When samples are loaded, they are automatically normalized to 0 dB. This facilitates matching the levels of the extracted waves.

If you extract waves from loud and from quiet parts of the sample, the levels of these extracted waves differ. In this case, you can normalize the waves to match their levels with each other.

- **Off** plays back the waves at their original levels.
- **Wave** normalizes each wave of the wavetable individually.
- **Sequence** normalizes the loudest wave in a sequence. The levels of the other waves in this sequence are adjusted accordingly. If the wavetable contains multiple sequences, each sequence is normalized individually.




#### NOTE

The original level of the waves in the wavetable remains unaffected. Only the playback is normalized.

---

### Phase Mode

The wavetable envelope applies crossfades between consecutive waves. Depending on the phase of the waves, different amounts of phase cancellation occur during the crossfade. To minimize the effects of phase cancellation, the phases of the waves can be altered during playback.

- If **Keep Original Phases**  is activated, the waves play in their original phase. Phase cancellation can occur during the crossfades.
- If **Align Phases**  is activated, the phases of the waves are aligned. The effect of phase cancellation is minimized.
- If **Reset Phases to Zero**  is activated, the phase of all harmonics is set to 0 degrees. There is no phase cancellation because all harmonics of the waves are in phase. However, the sound quality is less natural, compared to the other modes.

### Interpolate Phases



If this button is activated, the wavetable envelope creates crossfades for both the levels and the phases of the waves. This can further minimize the effects of phase cancellation.

#### NOTE

- This option is only available for **Keep Original Phases** and **Align Phases**.
  - This option can introduce pitch modulation.
- 

### Pitch Envelope Playback

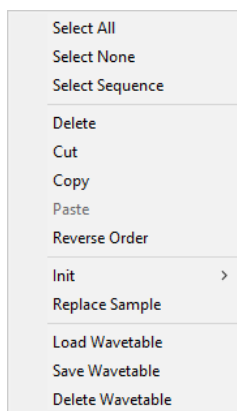


Allows you to play back the waves with the pitch that is specified by the fundamental frequency for each channel. This way, you can play back a wavetable with the melodic



information contained in the original sample, for example. By default, this option is not active, and all waves are played with the pitch of the triggered note.

## Context Menu



### Select All

Selects all waves in the wavetable.

### Select None

Deselects all waves in the wavetable.

### Select Sequence

Selects all waves in the current sequence.

#### NOTE

In this context, a sequence is defined as a series of consecutive waves from the same sample.

---

### Delete

Deletes the selected waves.

#### NOTE

If you delete all waves from a wavetable, the last sample that was visible in the sample display is kept. This allows you to start over if the wavetable was not to your liking.

---

### Cut

Cuts the selected waves to the clipboard.

### Copy

Copies the selected waves to the clipboard.

### Paste

Pastes the waves from the clipboard at the current position.

### Reverse Order

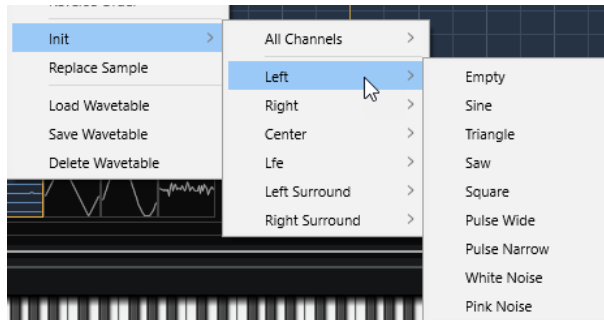
Reverses the order of the selected waves, including their envelope times. This command is only available if multiple waves are selected. If several waves are selected but they have unselected waves in between, the order of the selected waves is changed, whereas the unselected waves remain unaffected.

### Init

Allows you to replace a wavetable with a precalculated, mathematically perfect waveform. You can choose from **Sine**, **Triangle**, **Saw**, **Square**, **Pulse 1**, **Pulse 2**, **White Noise**, or **Pink Noise**.

**White Noise** and **Pink Noise** use the spectrum of white and pink noise to fill the wave with random numbers. You obtain different waves, each time that you select **White Noise** or **Pink Noise**.

For multi-channel waves, you can select the waveform for each of the channels.



### Replace Sample

Allows you to change the sample that is used by the selected wave.

### Load Wavetable

Allows you to load a wavetable.

### Save Wavetable

Allows you to save the current wavetable.

### Delete Wavetable

Allows you to delete a wavetable.

## Editing the Wavetable

You can edit the wavetable by copying, replacing, and rearranging the waves.

- To select a wave, click on it.
- To select multiple waves, **Shift**-click on them.  
The corresponding segments in the wavetable envelope are highlighted.
- To select all waves from a sequence, double-click a wave, double-click the marker for a wave, or open the context menu, and select **Select Sequence**.
- To copy the selected waves, hold down **Alt/Opt**, and drag them to a new position in the wavetable.
- To change the order of the waves, drag them to a new position in the wavetable.  
The insert position is indicated in red.  
The order of the waves in the wavetable determines how the sound evolves when you modulate the position, either automatically with the **Speed** parameter or manually in the modulation matrix.
- To replace a wave with another wave, drag the new wave onto the wave that you want to replace.

### NOTE

This operation only works with single waves.

---

## Creating a Wavetable

---

### PROCEDURE

1. Open the **Wavetable Editor** for a wavetable zone, and load a sample using one of the following methods:
    - Drag and drop a sample to the sample display.
    - Drag a sample to the wavetable, and drop it where you want to insert a new wave or replace an existing one.  
The insert location is indicated by a red line. The replace location is indicated by a red frame.
  2. Enter wave extraction markers in the sample using one of the following methods:
    - **Alt/Opt**-click the sample at the position where you want to insert a marker.
    - Enter the number of markers that you want to use in the **Markers** value field.  
This adds the corresponding waves to the wavetable.
  3. Optional: On the **Envelope** and **Spectrum** tabs, adjust the wavetable envelope, or edit the spectrum of the wave.
  4. Optional: Change the order of the waves in the wavetable.
  5. Optional: Click **Insert from Sample** in the toolbar above the wavetable to add more waves from other samples.
- 

## Pitch Detection

The **Wavetable Editor** automatically detects the pitch of samples that are added.

Positions in a sample where the pitch is properly detected usually contain a harmonic spectrum that is suitable for wave extraction. In some cases, however, the pitch cannot be detected correctly. This can be the case if a vocal sample contains breath noises, for example.

Normally, you would not want to use these positions in samples for wave extraction. Therefore, for visual feedback and orientation, you can display and edit the pitch detection curve in the **Wavetable Editor**.

### NOTE

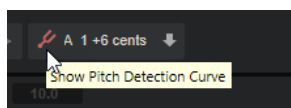
The pitch detection is executed on all channels individually.

---

## Pitch Detection Curve

The pitch detection curve shows you where in a sample the pitch can be detected properly.

To show the pitch detection curve, click the corresponding button above the **Sample** display.



For example, if you use a sample that has a constant pitch but that shows peaks and troughs at some positions in the pitch detection curve, this means that the detection is incorrect at these positions. This is not unusual if you work with complex audio samples. However, if waves are extracted from these positions in most cases, the results are unsatisfactory. You can prevent

HALion from using improperly detected pitches as extraction positions, either by correcting the pitch detection curve or by setting the extraction markers manually.

#### NOTE

- When loading long samples, the pitch detection may take a little time to process the entire file. During this time, a progress bar is shown.
- If the pitch detection fails, that is, if the pitch curve has gaps, an adjacent detected pitch is used. If this is not what you want, you can set a fixed window size from the **Window Size Mode** pop-up menu on the toolbar.

#### RELATED LINKS

[Toolbar](#) on page 250

## Markers

Markers in the sample display indicate the position in a sample that the wave is extracted from. You can enter markers manually or create them automatically.

### Creating Wave Markers Automatically

- 1 Select the portion of the sample you want to analyze.  
If you do not make a selection, the entire sample is analyzed.
- 2 Select a **Marker Creation Mode**.
- 3 Use the **Number of Markers** or the **Threshold** parameters to create the markers.

### Creating and Removing Wave Markers Manually

- To add a marker, **Alt/Opt**-click at the position where you want to insert the marker.  
For each marker, a wave is added to the wavetable, and an envelope segment is added to the wavetable envelope.
- To remove a marker, **Alt/Opt**-click it.

#### NOTE

You can move markers by dragging them in the display.

### Moving Selected Wave Markers

You can change the position and distribution of wave markers within a multi selection of markers.

- To compress or expand all markers, hold down **Ctrl/Cmd**, and move the first or the last marker of the selection.
- To modify the distribution of the markers inside the selection, hold down **Ctrl/Cmd**, and move one of the middle markers.  
Moving the marker towards the first or last marker increases the density of markers on one side and decreases it on the other side.

## Replacing Samples

When you replace a sample, HALion tries to maintain the marker positions. However, if the new sample is shorter, any markers that would end up in an area beyond the new sample are set to the end of the sample instead.

To replace a sample, you can do one of the following:

---

### CHOICES

- Drag a sample from the browser onto the sample display.  
This replaces all waves for which markers are visible in the sample display. If other waves of the same sample are used in other wave sequences, these waves are not replaced.
  - Drag a sample from the browser onto a selection of multiple waves in the wavetable.  
This replaces the selected waves.
  - Drag a sample from the browser onto a single wave that is not part of a multi-selection of waves.  
This replaces only the wave on which you drop the sample.
  - Click **Replace Sample** on the wavetable toolbar.  
This replaces all waves for which markers are visible in the sample display. If other waves of the same sample are used in other wave sequences, these waves are not replaced.
- 

## Importing Wavetables

HALion can import wavetables that were saved as .wav files. You can import .wav files consisting of one wave or of multiple single-cycle waves.

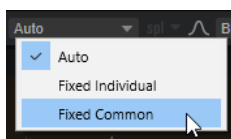
If the file header of the .wav file contains information about the size of the single-cycle waves of the wavetable, HALion imports the wavetable automatically when the wave file is loaded. The waves of the wavetable and the corresponding wavetable envelope will be set up to fit a duration of 2 seconds.

If the file header does not contain this information, you can specify it manually.

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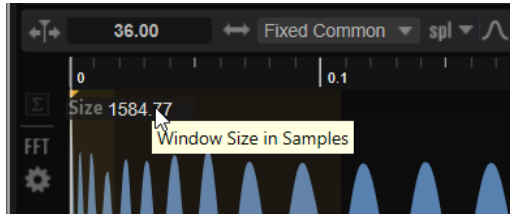
### PROCEDURE

1. Load the .wav file.
2. On the toolbar, set **Window Size Mode** to **Fixed Common**.

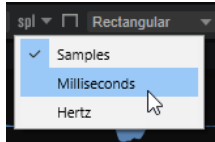


This way, the same window size is used for all channels.

3. Enter the window size in the waveform display.  
Usually, a readme file or a technical specification that gives you information about the size of the single-cycle waves is provided with the wavetable.



On the **Window Size Format** menu, you can select whether you want to set the size in samples, milliseconds, or Hertz.



4. On the toolbar, activate **Include Window in Range**.  
This ensures that the markers are set in such a way that the analysis windows always encompass the full range of the sample.
5. Do one of the following:
  - On the toolbar, set **Wavetable Creation Mode** to **Overlap-Add** and **Overlap** to **None**.
  - On the toolbar, set **Wavetable Creation Mode** to **Equal Distance**, and enter the correct value in the **Number of Waves** field.

---

RELATED LINKS

[Managing Wavetables](#) on page 272

## Managing Wavetables

The **Wavetable Editor** allows you to load, save, and delete wavetables.

The wavetable is always saved with the VST preset. However, you can also save the wavetable in the wavetable library. This allows you to load the wavetable in other presets, for example.

### NOTE

Wavetables do not contain any samples. Instead, each wave contains information on the spectrum and the envelope.



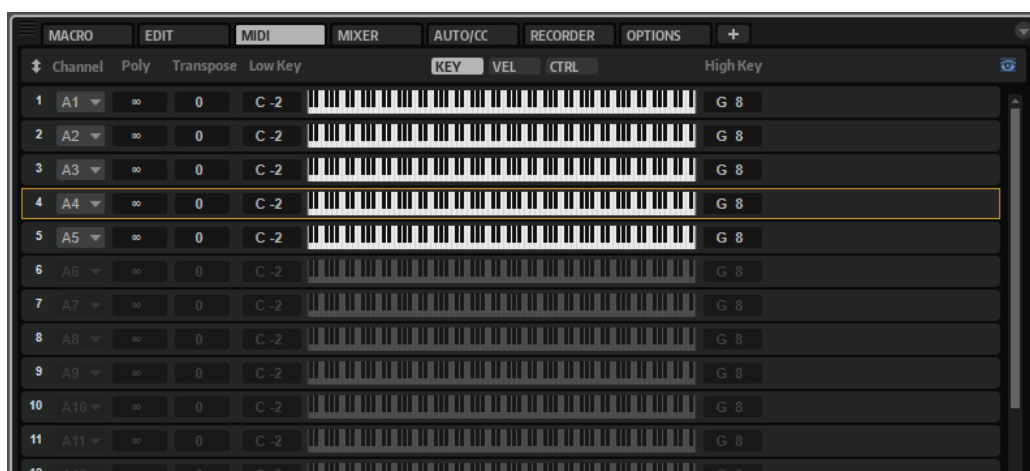
- To load, save, and delete wavetables, use the corresponding buttons to the right of the **Envelope** and **Spectrum** tabs.

# MIDI Editing and Controllers

You can make MIDI and MIDI controller settings in the **MIDI Editor**, the **MIDI CC** editor, and the **Options Editor**.

## MIDI Editor

The **MIDI Editor** provides access to the MIDI slot parameters. Furthermore, you can specify MIDI controllers for filtering.



### Channel

Allows you to specify the channel and the MIDI port to be used by the slot to receive MIDI signals. You can set multiple slots to the same MIDI channel and trigger them simultaneously with the same note events.

### Polyphony

Specifies how many notes can be played at the same time.

NOTE

Programs can contain various layers. Therefore, the resulting number of voices can be much higher than the value that is specified here.

### Transpose

Allows you to shift the incoming MIDI notes by  $\pm 64$  semitones before they are sent to the loaded program.

### Key Range (Low Key, High Key)

Allows you to limit the key range for a slot.

### Velocity Range (Low Vel, High Vel)

Allows you to limit the velocity range for a slot.

### Controller Filter

Allows you to filter out the most commonly used MIDI controllers.

### Show Empty Slots

- If this button is activated, the **MIDI Editor** shows all program slots.
- If this button is deactivated, the **MIDI Editor** shows only the slots that contain programs.

## Editing the Key Range

Each slot can be limited to a specific key range.

To show the key range, activate the **Key** button above the range controls.



You can set the key range in the following ways:

- Set the range with the **Low Key** and **High Key** value fields or by dragging the ends of the keyboard range control.
- To move the key range, click in the middle of the range control and drag.
- To set the range via MIDI input, double-click in a value field, and play the note.

## Editing the Velocity Range

Each slot can be limited to a specific velocity range.

To show the velocity range, activate the **Vel** button above the range controls.



- Set the velocity range with the **Low Vel** and **High Vel** value fields or by dragging the ends of the velocity range control.  
To move the velocity range, click in the middle of the range control and drag.

## Filtering Controllers

You can filter out the most commonly used MIDI controllers for each slot separately.

For example, if you set up a keyboard split with bass and piano playing on the same MIDI channel, both sounds receive the same MIDI controllers. However, you usually do not want the bass to receive the sustain pedal. To avoid that all sounds on the same MIDI channel receive the same MIDI controllers, use the controller filter.

Filtering out control change messages can also be used to avoid unwanted program changes on MIDI channel 10 (drums), for example.

---

### PROCEDURE

1. Activate the **Ctrl** button above the range controls.
2. For each slot, activate the MIDI controllers that you want to filter out.

You can filter out the following MIDI controllers: Sustain Pedal #64, Foot Controller #4, Foot Switches #65-69, Pitchbend, Modulation Wheel #1, Aftertouch, and Program Change.

---



## MIDI Controllers

HALion allows you to assign almost any parameter to a MIDI controller. However, you can only assign one parameter of a single zone, layer, effect control, etc. at a time. If you want to use the same MIDI controller for several zones, layers, etc., you have to assign it several times.

A more convenient way to control a zone parameter, such as the cutoff frequency for all zones, is to assign a quick control to that parameter and then assign the MIDI controller to that quick control. This allows you to control all zones simultaneously. This way, you can also preserve different cutoff settings per zone and simply control the offset that is added by the quick control.

By default, the most common parameters like slot volume and pan, and the quick controls of each slot are already assigned. The AUX FX send modules 1-4 for the slots are also assigned and can be controlled as soon as you load one of the AUX FX send modules for an insert effect.

To provide more control, you can set the minimum and maximum range for each assignment separately.

## Assigning MIDI Controllers

---

### PROCEDURE

1. Right-click the control that you want to control remotely, and select **Learn CC**.
2. On your MIDI keyboard or controller, use the potentiometer, fader, or button.  
The next time you right-click the control, the menu shows the assigned MIDI controller.

### NOTE

You can assign the same MIDI controller to different parameters several times. However, you cannot assign different MIDI controllers to the same parameter.

---

### RELATED LINKS

[MIDI Controller Section](#) on page 48

## Unassigning MIDI Controllers

---

### PROCEDURE

- To remove a MIDI controller assignment, right-click the control, and select **Forget CC**.
- 

## Restoring the Factory MIDI Controller Assignment

To restore the factory MIDI controller assignments, open the **Options Editor**, and click **Reset to Factory** in the **MIDI Controller** section.

## Setting the Parameter Range

---

You can set the minimum and maximum values of the parameter for each assignment separately. This gives you more control over the parameter, for example, when you are performing live on stage.

### PROCEDURE

1. Set the parameter to the minimum value.
2. Right-click the control, and select **Set Minimum** from the context menu.

3. Set the parameter to the maximum value.
  4. Right-click the control, and select **Set Maximum**.
- 

## MIDI Controllers and AUX FX

You can assign the parameters of the AUX FX to MIDI controllers.

Unlike the slots, the AUX FX do not have a MIDI port and channel of their own. Instead, they listen to any incoming MIDI controller message, regardless of the MIDI channel. Therefore, if you assign a parameter to a MIDI controller, you should use a controller number that is not already in use by any of the assignments that you made for the slots.

### NOTE

If you unload or replace the effect, the MIDI controller assignment of this effect is lost.

---

## Saving a MIDI Controller Mapping as Default

After customizing the factory MIDI controller assignments, you can save them as defaults.

---

### PROCEDURE

- Open the **Options Editor** and, in the **MIDI Controller** section, click **Save as Default**.
- 

### RESULT

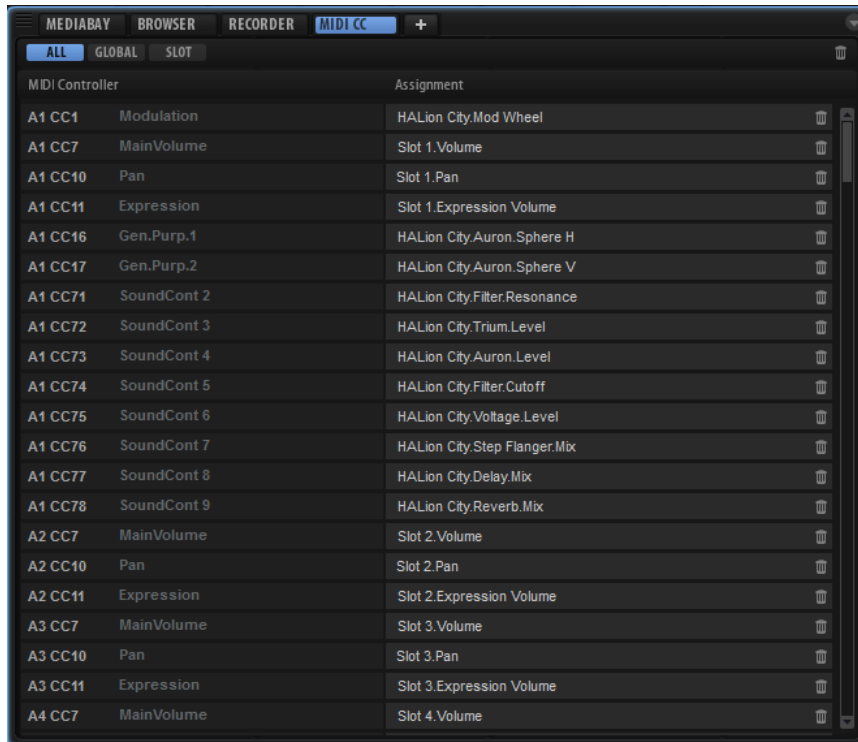
Now, each time that you load a new instance of the plug-in, your customized MIDI controller mapping is available as default.

### NOTE

- Saving the controller mapping as default does not include the MIDI controller assignments of the AUX FX.
  - The MIDI controller mapping is saved with each project. This way, you can transfer your settings to other systems. The project also includes the MIDI controller assignments of the AUX FX.
-

## MIDI CC Editor

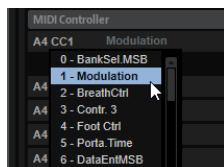
In the **MIDI CC** editor, all assigned MIDI controllers are shown.



With the buttons at the top, you can specify whether you want to show only the MIDI controllers that are assigned to the slot, to global parameters, or whether you want to show all of them.

On the left, the name of the MIDI controller is shown, and on the right, the name of the assigned HALion parameter. If several HALion parameters are assigned to the same MIDI controller, they are listed below each other on the right.

- To change the MIDI controller for an assignment, click on it in the left column, and select another controller from the list.



- To remove a single MIDI controller assignment, click the trash icon to the right of the parameter name.
- To remove all MIDI controller assignments, click the trash icon on the toolbar.

## Automation and Factory MIDI Controller Assignment

Several parameters on the plug-in interface are available for automation from your host software and can be assigned to an external MIDI controller.

The table shows the controller numbers and the names of the default factory MIDI controller assignment. The assigned MIDI controller numbers are the same for all slots. However, the MIDI controllers listen only to the MIDI channels of the corresponding slot.

<b>Parameter</b>	<b>Controller Number</b>	<b>Name</b>
Volume	#7	Volume
Pan	#10	Pan
Expression	#11	Expression Volume
Send FX 1	#91	Effect 1 Depth
Send FX 2	#92	Effect 2 Depth
Send FX 3	#93	Effect 3 Depth
Send FX 4	#94	Effect 4 Depth
Program QC 1	#74	Brightness
Program QC 2	#71	Harmonic Content
Program QC 3	#73	Attack Time
Program QC 4	#72	Release Time
Program QC 5	#75	Sound Controller #6
Program QC 6	#76	Sound Controller #7
Program QC 7	#77	Sound Controller #8
Program QC 8	#78	Sound Controller #9

---

**NOTE**

- Send FX 1-4 are only available if the corresponding AUX send effects are loaded.
  - You can remote-control any other parameter by first assigning the parameter to a quick control and then to a MIDI controller.
  - You can use MIDI controllers inside the modulation matrix of a synth or sample layer to control the cutoff, for example.
-

# Mixing, Routing, and Effect Handling

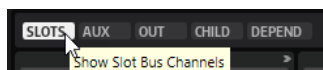
You can perform your mixing operations in the **Mixer**.



## Mixer Window

The **Mixer** manages all busses that are available in a HALion instance, that is, the 32 stereo output busses plus one surround bus, the 64 slot busses, the four AUX busses, and a dynamic number of program and layer busses depending on the current program architecture.

You can control each bus using a dedicated mixer channel that contains **Level**, **Pan**, **Mute**, and **Solo** controls, and up to eight insert/send effects. You can specify which type of bus you want to see by activating the corresponding tab.



### Show Slot Bus Channels

Shows all slot channels.

### Show AUX Bus Channels

Shows the AUX channels.

### Show Output Bus Channels

Shows all output channels.

### Show Child Bus Channels


Shows all the busses that can be found inside the selected program or layer hierarchy.

### Show Depending Bus Channels


Shows all busses that are in use for the selected program or layer, including AUX busses.

## Toolbar



### Hide Inactive Outputs

If **Show Output Bus Channels** is activated, the **Mixer** shows all output busses. Deactivated outputs are grayed out. To gain a better overview of the channels in use, activate **Hide Inactive Outputs** .

### Show Empty Slots

If **Show Slot Bus Channels** is activated, the **Mixer** only shows channels that are in use by programs loaded in the corresponding slots. To show the empty slot channels as well, activate **Show Empty Slots** .

### Collapse All Mixer Channels/Expand All Mixer Channels

- To expand all mixer channels, click **Expand All Mixer Channels** .  
Expanded mixer channels provide direct access to the insert/send effects.
- To collapse all mixer channels, click **Collapse All Mixer Channels** .  
Collapsed mixer channels only show the most important controls, that is, level, pan, solo, mute, and a level meter.

### Auto Expand Selected Mixer Channel



Expands a mixer channel to its full width when clicking the channel name or selecting the corresponding slot in the **Slot Rack**. The other channels are collapsed, except for the slots that have been expanded using the **Expand Mixer Channel** button for the channel strip.

## Channel Strip Controls

### Expand/Collapse Mixer Channel



Expands/Collapses the mixer channel so that the effect slots are shown/hidden.

### Mute



Mutes the bus.

### Solo



Mutes all other busses and allows you to hear the solo bus only. You can set several channels to solo mode to hear all of them.

### Level



The level fader allows you to adjust the volume of the bus. All busses allow for an amplification of +12 dB.

### Pan



All stereo mixer channels provide a stereo panner that allows you to define the position of the sound in the stereo field. When working with surround busses, you can insert a surround panner effect into one of the insert slots of a bus and use it to pan the stereo signals in the surround field.

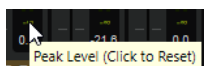
The mixer channel shows a small version of the surround panner, which can be used to remote-control the inserted surround panner. For more detailed editing, use the **Sound Editor** of the surround panner.

### Meter



The meters of a mixer channel show the output level of the bus. The number of meters depends on the number of audio channels of the bus. Stereo busses have two channel meters, surround channels have six.

### Peak Level



The peak level meter indicates the highest level on the bus in dB. To reset, click the peak level.

### Output



Each channel can be routed to multiple busses. Click the output pop-up menu, and select an output.

The output busses represent the audio interface to the host application or the audio hardware. Therefore, these channels cannot be routed freely and do not have an output pop-up menu.

#### NOTE

You can route the bus of a surround slot to one of the stereo output busses. In this case, only the first two channels are connected. You can remedy this by adding a downmix effect to the surround output bus, or you can reroute the slot to a surround output bus.

---

## Audio Bus Architecture

The audio signals of zones, layers, programs, and slots are managed via audio busses. You can load insert effects into any of the audio busses, for example, to process the audio of a single layer or an entire program.

Slots have one dedicated bus.

Programs can have one or more audio busses that mix the audio signals from the layers and zones that they contain.

Layers do not have to have an audio bus. However, you can create audio busses for layers, for example, to create a submix of the zones that they contain.

AUX busses allow you to use send effects with zones, layers, programs, and slots. Send effects can be shared between zones, layers, programs, and slots, but you can also add local AUX busses to use send effects for individual zones or layers.

Zones do not have an audio bus of their own. Instead, their outputs are automatically routed to the next available audio bus. Any zone, audio bus, and AUX bus can be assigned freely to one of the stereo outputs or to the surround output of the plug-in. For example, a zone output can be routed to an output bus, omitting any audio busses and their effects in between.

## Audio Signal Flow

Typically, programs are loaded into slots. Each slot is connected to an output bus. The audio busses from the program send their signals to the audio bus of the slot.

A program can contain a single or multiple zones, or one or more layers. Layers can contain other layers, which in turn can contain zones. The output of the zones is mixed to the audio busses of the layers of the next higher level or directly to the program.

### NOTE

If a layer does not have an audio bus, its zones are automatically routed to the next higher audio bus.

---

## Audio Busses

Audio busses can be compared to channels in a mixer, but with much more flexibility when it comes to mixing and routing possibilities.

Each slot has at least one audio bus that mixes the audio signals from its layers and zones.

Apart from the routing and mixing possibilities, audio busses allow you to load insert effects for processing audio in that bus. Depending on how you set up the audio busses, you can load insert effects in single layers, the whole program, or the slot. For example, you can process only the strings of a piano and strings layer sound with a chorus effect, and keep the piano unprocessed. You load insert effects into the effect slots of the channels in the **Mixer**.

In addition, audio busses allow you to route audio to an AUX bus via sends. This way, you can set up send effects which can be shared among the layers, programs, and slots. You assign sends directly in the zones or with the effect slots of the channels in the **Mixer**. You can adjust the level for the sends, which allows you to control the amount of the effect that is loaded in the AUX bus.

## Slot Bus Channels



A slot outputs its audio busses to the master outputs of the plug-in. Each slot has one audio bus. You can reassign the outputs of the audio busses of the slots to any plug-in output bus.



## AUX Bus Channels



You need an AUX bus to route individual audio signals from zones or audio busses to AUX effects. HALion provides four global AUX busses and four local AUX busses that you can add for individual layers. By default, the output of an AUX bus is routed to the master output bus, but you can reassign its output to other output busses.

- To set up an AUX effect, load an insert effect into one of the effect slots of the AUX bus.
- To hear the effect, raise the send level of a zone, route the output of a zone or your audio bus to the AUX bus, or set up a send in the effect rack of your audio bus.

The send levels control the amount of the effect that is loaded into the AUX bus. You can set up separate sends for each zone and audio bus.

## Master Effect Bus

The master bus works similarly to the AUX busses. The only difference is that the master bus has no bus output selector, because it is hard-wired to the main plug-in output (1/2).

## Programs

By default, audio busses of programs are routed to the audio bus of the slot into which the program is loaded. You can create additional audio busses. You can reassign the outputs of the audio busses of the program to any master output.

## Layers

To save processing power, audio busses for layers are optional. You can create them at any time in the **Program Tree**. By default, audio busses of layers are routed to the first audio bus of the next higher layer or the program. You can reassign the outputs of the audio busses of the layers to any master output.

## Zones

The output of a zone is routed to the first audio bus of the layer that the zone resides in or to the program bus.

In the **Zone Editor**, you can reassign the outputs of the zones to the available busses and plug-in outputs using the **Output** pop-up menu in the **Amplifier** section.

## Multi-Channel Effects

HALion comes with a large number of effects that are mainly intended for use on stereo busses. However, most of them can also be used on surround busses. In this case, the effect is processed on all channels. If a bus changes from stereo to surround, the effect follows. For effects with level meters, the number of meters is adapted accordingly.

## Creating Audio Busses

---

### PROCEDURE

1. In the **Program Tree**, select the program or layer to which you want to add a bus.
  2. Click the **Create New Bus** icon on the toolbar.
- 

### RESULT

The audio bus and a corresponding **Mixer** channel strip are created.

---

## Changing the Output Assignment of an Audio Bus

---

### PROCEDURE

1. In the **Mixer**, activate the **Show Depending Bus Channels** button.
  2. In the **Program Tree**, select a layer or a program with one or more audio busses.  
All corresponding channels are shown in the **Mixer**. Additional audio busses are displayed to the right of the first audio bus.
  3. In the **Mixer**, click on the output of the audio bus that you want to edit, and select an output from the pop-up menu.  
The output busses of the plug-in can be activated in the host sequencer or in the **Preferences** dialog of the standalone version.
- 

## Changing the Output Assignment of an AUX bus

---

### PROCEDURE

1. In the **Mixer**, activate the **Show AUX Bus Channels** button on the toolbar.
  2. Click on the output selector of the AUX bus that you want to edit, and select an output bus from the pop-up menu.
- 

## Changing the Output Assignments of Zones

You can change the output assignments of zones in the **Sound Editor** or the **Zone Editor**.

---

### PROCEDURE

1. Select a zone in the **Program Tree**.
  2. Open the **Sound Editor** or the **Zone Editor** and show the **Amplifier** section.
  3. From the **Output** pop-up menu, select a plug-in output or an AUX bus.
  4. Optional: Use the send level controls of the zone to route individual audio signals to insert effects on AUX busses.
-

## Automatic Bus Width Adaptation

HALion is constantly monitoring the width of all busses in the signal path and adapts to the required width automatically.

For example, changing the bus width is required when you add a surround sample zone to a layer that only contains stereo samples. In this case, the layer bus and all following busses are set to surround, to allow for a correct routing. Stereo samples are still routed properly to channels 1 and 2.

Another way to change the bus width in the middle of the signal path is to add a surround panner to one of the insert effect slots of a stereo bus. In this case, the output of the bus changes from stereo to surround and forces all following busses to do the same.

### NOTE

AUX busses change their bus width, too, if they receive signals from surround sources.

Output busses cannot change their bus width automatically, because they are usually connected to a hardware device. Therefore, the routing to the plug-in output busses has to be changed manually. Make sure that surround slots are routed to the surround output and that stereo busses are routed to one of the stereo outputs.

If your routing is not set up correctly, the affected channels show a red warning icon to indicate that two or more busses are of the wrong width and that you risk losing signals from audio channels that cannot be processed.

In this case, you can connect surround busses to stereo outputs, for example, or add the Downmix effect to one of the inserts, thereby reducing the bus width to stereo, for example.

## Local AUX Busses

In addition to the global AUX busses, you can also create local AUX busses for layers. This allows you to integrate typical AUX effects like reverb or delay into a program, for example.

If you add a local AUX bus for a layer, the signal routing for the layer automatically changes from the global AUX bus to the new local bus.

AUX busses can be distinguished in the **Program Tree** by their green bus icon. A small number inside the icon indicates the specific AUX bus. AUX send effects that were added to a normal bus show a red effects icon with the same small numbers. This way, you can identify which AUX busses and sends are used, even if their names have been modified.

- To add a local AUX bus, select the layer for which you want to add the bus in the **Program Tree**, click the **Add Bus** button on the toolbar, and select one of the four AUX busses from the menu.
- To remove a local AUX bus, select it in the **Program Tree**, and press **Delete** or **Backspace**, or use the **Delete** command on the context menu.

When you remove a local AUX bus, all sends that were routed to it are sent to the global AUX busses.

## Automatic Output Connection

If connections to busses cannot be established in HALion, the signals are automatically routed to the master bus.

HALion allows you to select outputs in many places. You can find output selectors in zones, layer busses, AUX busses, and slots. Each output can be freely named, and the output selectors reflect these names.

Different programs on different slots may contain output configurations that are not available, for example, because busses with the required names are not present in a multi.

- If connections cannot be established, a dialog opens showing all pending busses. For each missing bus, you can select another bus to be used instead.  
Pending busses can also occur when loading layers into programs. If a layer does not find the required busses, the same dialog opens.
- If an assigned output bus is deactivated in the host, HALion shows a red warning icon on the output channel and the **Mixer** channels that are connected to it.  
You are still able to hear the signal because all signals are routed to the master bus in the background. However, all output selectors remain as they are, allowing you to reestablish the connections later, by activating the outputs in your host, etc.

## Output Configurations in Different Hosts

### Apple Logic 9

HALion provides 32 stereo outputs and one surround output connecting with the host application or a standalone hardware device. In most applications, all these outputs are available. However, Logic 9 only allows for 16 outputs for a single plug-in. When you open HALion, you can choose one of 4 output configurations: Stereo, 5.1-Surround, Multi-Output (1x5.1, 15xStereo), and Multi-Output (16xStereo).

### Ableton

Ableton Live 8 does not support surround busses.

### Sonar 9

Sonar 9 allows you to activate all outputs either in mono or in stereo. For mono, you get 64 channels for the 32 HALion stereo channels plus six channels for the surround bus. If the stereo outputs are activated, Sonar uses 32 stereo channels plus three stereo channels for the surround bus.

## Insert Effects

Each channel can load up to eight insert effects. The inserts are shown on expanded channel strips.



Each insert can either be a classical insert effect like a chorus or a delay, or it can load one of the AUX send effects that allow you to send the signal to the AUX busses. All slot, program, and layer busses, as well as zones, can send signal portions to these busses. If an AUX send effect is loaded, a level fader is available for the insert slot. You can use this fader to set the level that is sent to the AUX bus.

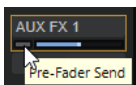
**NOTE**

You cannot use send effects on AUX and output busses.

---

### Pre-Fader Send Effects

By default, send levels are influenced by the level of the bus. If you want to adjust the send level independently from the bus level, you can set the send to pre-fader by activating the corresponding button to the left of the level fader.



## Using the Insert Effect Slots for the AUX Busses

In the **Mixer**, you can set up insert effects for AUX busses. Each bus provides eight slots for insert effects.

---

### CHOICES

- To assign an insert effect, click the effect slot, and select the effect from the menu.
  - To remove an insert effect including its current settings, click the effect slot, and select **None** from the menu.
  - To bypass an effect, activate the **Bypass** button of the slot. Bypass is active when the button lights up.
  - To edit an insert effect, click the **e** button of the corresponding slot. You can edit only one effect at a time. The parameters of the insert effect are displayed in the bottom section.
  - To change the output assignment of a bus, select a different output from the **Output** pop-up menu.
  - To modify the level, move the fader of the bus, or double-click in the value field below the fader, and enter a value manually.
  - To move an effect to another slot, click its drag icon, and drag it to another slot. This replaces any effect loaded in this slot.
  - To change the order of the effects, drag their drag icon to a new position between two slots.
  - To copy an effect into another slot, **Alt/Opt**-click its drag icon, and drag it onto the new slot. This replaces any effect loaded in this slot.
  - To copy an effect and insert it between two effect slots, **Alt/Opt**-click its drag icon, and drag it between two slots.
-

# Loading and Managing Programs via the Program Table

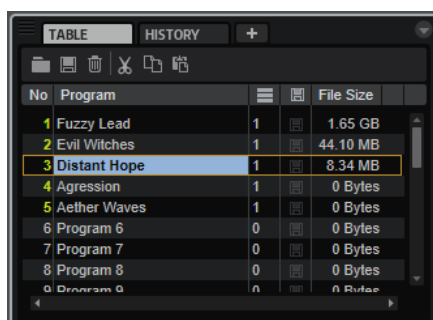
HALion allows you to load a virtually unlimited number of programs into the **Program Table**. This allows for quick access to these programs and for preloading the program samples for faster changes between programs.

## NOTE

Programs can only be played if they are loaded into the **Slot Rack**. However, you can perform editing like verifying the settings or copying zones for the focused program in the **Program Table**.

## Program Table

The **Program Table** lists all programs that are loaded in HALion.



No	Program	Used	File Size
1	Fuzzy Lead	1	1.65 GB
2	Evil Witches	1	44.10 MB
3	Distant Hope	1	8.34 MB
4	Agression	1	0 Bytes
5	Aether Waves	1	0 Bytes
6	Program 6	0	0 Bytes
7	Program 7	0	0 Bytes
8	Program 8	0	0 Bytes
9	Program 9	0	0 Bytes

The **Program Table** contains the following columns:

### Program Number

Displays the program number.

The first 128 entries of the **Program Table** correspond to the 128 MIDI program change numbers. You can load these programs into the **Slot Rack** by sending MIDI program change messages on the slot's MIDI channel.

Programs that are loaded into the **Slot Rack** are shown with a yellow number.

To assign a program to another MIDI program change number, you can drag it to the corresponding list position. If another program already occupies this position, the two programs change places.

### Program Name

Shows the program name. You can edit the name here.

### Used

Displays in how many slots in the **Slot Rack** the program is loaded.

### Preload

Indicates if the samples of a program are preloaded. This allows for faster MIDI program change.

- To activate the preload for a program, click the corresponding icon in the **Preload** column so that it lights up, or right-click in the **Preload** field, and activate **Always Preload Program**.

#### File Size

Displays the size of the program, with all its samples, as it is stored on the hard disk.

## Loading Programs in the Program Table

You can load a program into the **Program Table** without automatically loading it into the **Slot Rack**. This allows you to configure the **Program Table**.

---

#### CHOICES

- Drag the program from the **MediaBay** to a slot in the **Program Table**.

#### NOTE

If you drag multiple programs onto a slot, the programs are loaded into the target slot and the following slots. If the slots already contain programs, these are replaced.

- Click **Load Program** on the **Program Table** toolbar, select a program, and click **OK**.
- To load a program in the active slot in the **Slot Rack** and in a slot in the **Program Table** at the same time, right-click a program in the **MediaBay**, and select **Load Program into selected Slot**.

---

#### RELATED LINKS

[Loading Third-Party Sampler Programs](#) on page 89

## Configuring the Program Table

You can configure the **Program Table** by showing/hiding and rearranging the columns.

You can show/hide the **File Size**, **Preload**, and **Used** columns.

You can reorder columns using drag and drop and change the width of a column by dragging its borders.

---

#### CHOICES

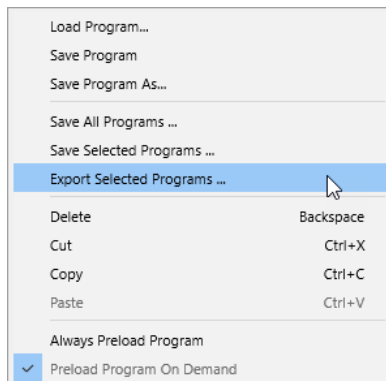
- To hide a column, right-click the column header, and use the corresponding **Remove** command.
- To insert a column, select its name from the column header context menu.

#### NOTE

All modifications to the columns are saved with the project.

---

## Program Table Context Menu



### Load Program

Allows you to load a program.

### Save Program

Saves the current program.

#### NOTE

Factory content cannot be overwritten. If you try to save a factory program, the **Save Program As** dialog opens, allowing you to save the program in your user content folder or the specified folder in your system.

---

### Save Program As

Allows you to save the current program or layer to your user content folder or the specified folder in your system.

### Save All Programs

Saves all programs in the **Program Table**.

### Save Selected Programs

Saves the selected programs.

### Export Selected Programs

Allows you to export multiple programs.

Activate **Export Files** to include all the files in the VST 3 preset.

Activate **Protect** to export the programs as a protected VST 3 presets.

Activate **As HALion Sonic Layer** to export the selected programs as HALion Sonic layer presets. These presets can then be loaded by HALion Sonic as layers or as programs.

### Delete

Deletes the program from the slot.

### Cut/Copy

Cuts/Copies the program from the current slot.

### Paste

Pastes the cut or copied program to the current slot.

### Always Preload Program

If a program is loaded into the **Program Table** but is not used in one of the slots, its samples are not preloaded. With this option, you can preload individual unassigned programs, to allow for a faster MIDI program change.



**Preload Program On Demand**

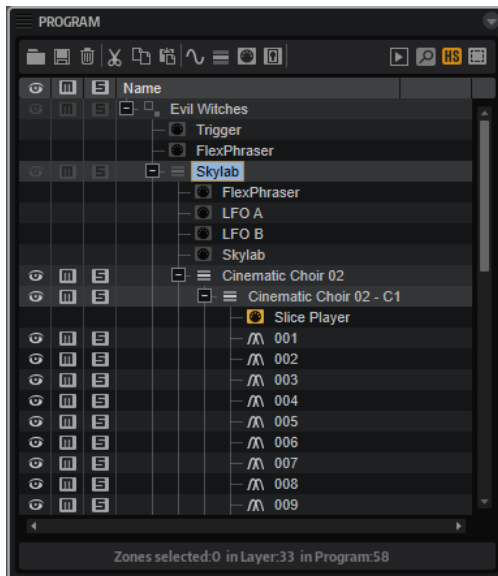
Activate this option if you want to preload the program samples only when the program is loaded into a slot.

RELATED LINKS

[Exporting Programs and Layers as HALion Sonic Layer Presets](#) on page 320

# Program Tree

The **Program Tree** is the main area for navigating and making selections. It shows the active program with all its layers, zones, and modules and allows you to add, load, import, or delete elements.



The **Program Tree** represents the signal flow inside the program. The MIDI comes in at the top and passes through the layers and MIDI modules. The processing order of the MIDI modules inside a program or layer is also from top to bottom.

The audio is output via busses that can have any number of FX modules. The processing order of the FX modules inside the busses is also from top to bottom.

## Program Tree Elements

The **Program Tree** shows all components of the program that is selected in the **Slot Rack**.

### Programs and Layers

Programs are the top-level elements in the **Program Tree**. Only one program is displayed at a time.

Programs are complex instruments or sounds that combine layers, zones, busses, MIDI modules, and FX modules. Often, a program contains a single layer that already comes with all necessary components, such as the synthesis part or insert effects. This is because a layer already is a complete sound structure on its own. Layers can be used to structure programs, for example, by grouping a number of zones. This is useful if you want to apply the same settings to a number of zones in a single step. Programs add the possibility of combining different layers to build up more complex sounds or to create combinations of sounds that you want to load as a unit. A typical example is a bass/piano split sound or a piano/string layer sound.

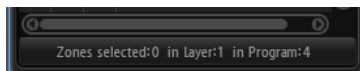
## Zones

Zones are the elements that create the sounds in HALion. In the **Program Tree**, the zone is the element on the lowest level.

Different types of zones are available: synth, sample, granular, organ, and wavetable. The zone types differ with regard to their basic sound source.

- Synth zones provide an oscillator section with three main oscillators, a sub oscillator, a noise generator, and a ring modulation stage.
- Sample zones load a specific sample.
- Granular zones offer a sophisticated grain oscillator section that contains a page for the grain-specific parameters and another page for the sample-related parameters.
- Organ zones produce the sound of classic drawbar organs with up to nine drawbars.
- Wavetable zones allow you to create your own wavetables by extracting single-cycle waves from samples.
- FM zones use frequency modulation as sound source.
- Spectral zones use the spectral oscillator as sound source.

The numbers below the **Program Tree** indicate how many zones are selected, how many zones are contained in the focused layer, and how many zones are contained in the program. This is useful for editing or deleting zones.



---

### EXAMPLE

For example, if you use a piano sound that was recorded with several velocity layers per note, each velocity layer has 88 sample zones. If you want to edit or delete an entire velocity layer, the numbers allow you to verify whether you selected the correct amount of zones before you edit or delete them.

---

## Busses

Busses allow you to set up the audio routing in HALion and to add audio effects.

## MIDI Modules

MIDI modules process the stream of MIDI events inside a program. They can produce monophonic modulation signals, which can be used as sources in the modulation matrix. MIDI modules can be assigned to an entire program or to a single layer.

## Audio Effects

Audio effects can be added for busses.

### RELATED LINKS

[Zone Types](#) on page 115

[Audio Bus Architecture](#) on page 281

[MIDI Modules Reference](#) on page 621


[Effects Reference](#) on page 560

## Creating Layers

You can create layers within programs or within other layers.

---

### CHOICES


- Click **Create New Layer**  on the toolbar.  
If a layer is selected, the new layer is added within this layer. If a zone is selected, the new layer is added on the same hierarchy level as the zone.
  - To add several layers on the same level, **Shift**-click **Create New Layer** on the toolbar for as many times as you want to add layers.
  - Right-click a layer, and select **New > Layer**.  
This creates a new layer within the selected layer.
- 

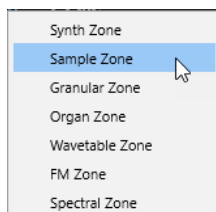
## Creating Zones

You can add zones to layers.

---

### CHOICES

- To create a sample zone, drag and drop a sample from the **MediaBay** or the File Explorer/ macOS Finder to a program or layer in the **Program Tree**.
- Right-click a layer in the **Program Tree**, select **New > Zone**, and select the type of zone that you want to create.
- Click **Create New Zone**  on the toolbar of the **Program Tree**, and select the type of zone that you want to create.



### NOTE

- When creating new zones, HALion uses the default zone preset to set the zone parameters to their default values. This preset contains all zone parameters, but no sample-related parameters like sample start/end, loop start/end, etc.
  - To use specific zone settings, modify the default preset, and save it as default in your user presets directory.
- 

### RELATED LINKS

[Zone Types](#) on page 115

## Saving Programs and Layers

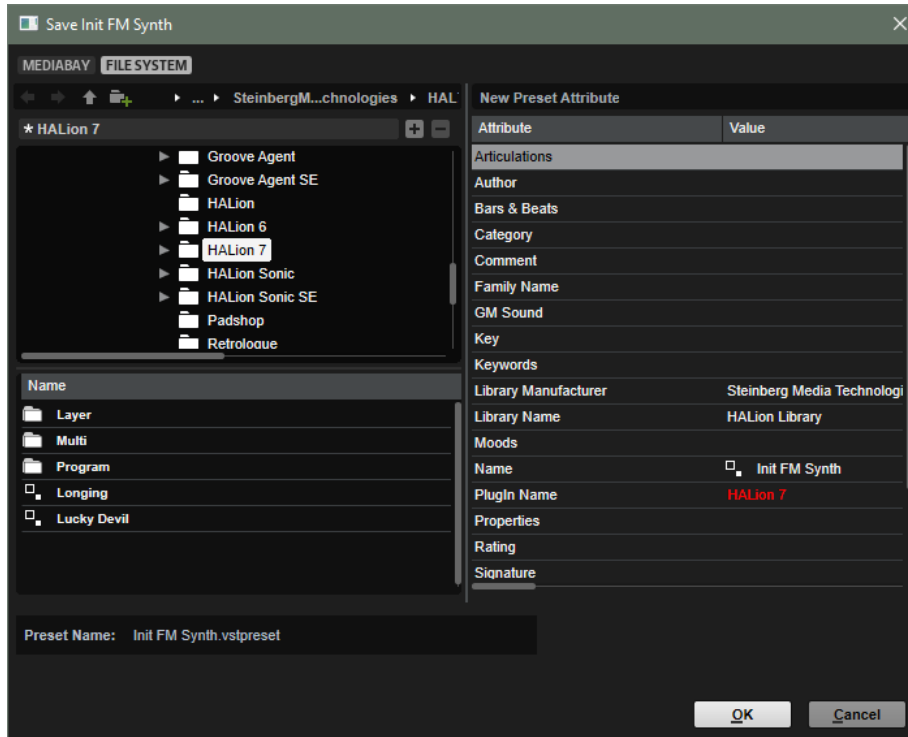
In the **Program Tree**, you can save programs and layers using the context menu. You can also save programs via the **Save Program** button on the toolbar.

---

### PROCEDURE

1. Select the program or layer that you want to save.
2. Open the context menu, and select **Load/Save > Save Program As/Save Layer As**.

3. In the dialog, specify a location on the left, and modify or add attributes on the right.  
Via the **MediaBay** tab, you can save the program or layer in the default location for user content.  
Via the **File System** tab, you can save the program or layer in any folder of your system. Below the location tree, a file list shows the files in the selected folder, enabling you to see the presets stored in this folder. This is useful if you want to overwrite an existing preset, because it allows you to see and copy its name and attributes.



4. Click **OK** to save the program/layer and close the dialog.

#### NOTE

Programs and layers are saved as .vstpreset files.

---

## Program Tree Toolbar

You can use the tools on the toolbar to load or save a program, modify a program by adding elements, set up a selection filter, and more.



### Load Program/Layer



Allows you to navigate to and load a program or layer.

### Save Program



Saves the program. If you try to overwrite write-protected factory content, a dialog opens that allows you to save the edited program to your user content folder or the specified folder in your system.

### Delete Selected Items



Deletes the selected items from the **Program Tree**.

#### NOTE

The files themselves are not deleted from the hard disk.

---

### Cut



Removes the selected elements from the list and saves them to the clipboard.

### Copy



Copies the selected elements to the clipboard.

### Paste



Pastes the elements from the clipboard at the selected position.

### Create New Zone



Allows you to create a new synth, sample, granular, organ, or wavetable zone at the selected position.

### Create New Layer



Creates a new layer at the selected position.

### Create New MIDI Module



Opens a selector where you can choose a MIDI Module to add it to the program.

### Create New Audio Effect



Opens a selector where you can choose an audio effect to add it to the selected bus.

### Create New Bus



Opens a menu from which you can add busses to the program. You can also add up to four AUX busses via the menu.

### Show Prelisten Panel



Allows you to show/hide the prelisten section, where you can play back the raw sample data of sample or granular zones. For other zones, the controls in this section cannot be used.



The section on the left shows the length, channels, bit depth, and sample rate of the focused sample.

The transport controls on the right allow you to quickly try out the sample without first having to open it in the **Sample Editor**.

TIP

Activate **Auto Play** to navigate through the **Program Tree** while listening to the samples.

---

### Show Filter Bar



Allows you to reduce the visible elements in the tree using a text search.



With the two buttons on the right, you can activate case-sensitivity for the filter and search for whole words only.

### Deactivate HALion Sonic Edit Mode



This button is available if you load a preset that was created in HALion Sonic and **HALion Sonic Edit Mode** is activated in the **Options Editor**. Click this button to deactivate **HALion Sonic Edit Mode** for the active preset.

NOTE

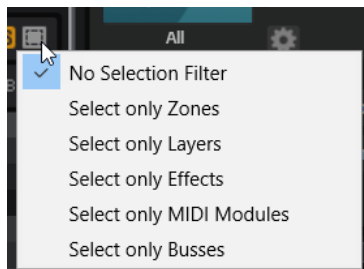
If you deactivate this mode, you can edit the preset without restrictions. However, the preset is saved as a HALion preset and cannot be loaded in HALion Sonic any longer.

---

### Selection Filter

By default, double-clicking on an element selects this element and all its contents. On the **Selection Filter** pop-up menu, you can restrict the selection to specific elements.

For example, if the **Selection Filter** is set to **Zones** and you double-click a program, all zones in all the layers are selected. If you double-click a layer, all its zones are selected.







## Program Tree Columns

The first three columns in the **Program Tree** give you access to the **Visibility**, **Mute**, and **Solo** functions. In the **Name** column on the right, the selected program and its elements are displayed. They are organized in a hierarchical structure, with the program at the topmost level.

By default, the **Program Tree** shows the **Visibility**, **Mute**, **Solo**, and **Name** columns. You can add further columns that show more information.

### Visibility

You can hide zones and layers in the **Mapping Editor** by clicking the eye icon  in the **Visibility** column of the **Program Tree**. The eye icon indicates the visibility status for zones, layers, and programs.

- If this icon is shown , the element and all its contents are visible.
- If this icon is shown , the element and all its contents are hidden.
- If this icon is shown , the element is visible, but parts of it are hidden.

You can use the following key commands for the **Visibility** functions:

- To show a single layer or zone and hide all other layers or zones, **Alt/Opt**-click its eye icon.
- To show all selected layers or zones, press **Ctrl/Cmd - U**.
- To show all layers and zones, press **Shift - Ctrl/Cmd - U**.

#### **Mute/Solo**

- To mute/unmute an element and all of its sub-elements, click the button in the **Mute** column. For example, if you mute a program or layer that contains zones, these zones are muted as well.
- To solo an element and mute all elements that reside on the same hierarchy level, click the button in the **Solo** column.
- To mute the selected zones, open the context menu of the **Program Tree** and select **Mute/Solo > Mute Selected Zones**.
- To mute all zones, open the context menu of the **Program Tree**, and select **Mute/Solo > Mute All Zones**.  
The program itself and any of its layers are not affected by this.
- To reset all mute settings, click the **Mute** icon in the column header.
- To reset all solo settings, click the **Solo** icon in the column header.

#### **Key Range**

Shows the key range of the zones, programs, and layers.

#### **Velocity Range**

Shows the velocity range of the zones, programs, and layers.

#### **Root Key**

Shows the root key of the zones.

#### **Tune**

Shows the tune offset of sample zones.

The **Tune** parameter is set in the **Mapping Editor**.

#### **Gain**

This shows the gain offset of sample zones.

The **Gain** parameter is set in the **Mapping Editor**.

#### **File Size**

Shows the size of the samples, as they are saved on the hard disk. Programs and layers show the sum of the samples that they contain.

#### **Preload**

Shows the amount of preload per sample.

#### **Mute**

Contains the **Mute** buttons for the elements of the **Program Tree**.

#### **Solo**

Contains the **Solo** buttons for the elements of the **Program Tree**.



### Visibility

Contains the **Visibility** icon for the elements of the **Program Tree**. You can click the icon to change the visibility setting for each element.

### Learn Zone Parameter

Allows you to display a zone parameter in a column.

#### RELATED LINKS

[Edit Section](#) on page 44

## Configuring the Columns

You can add and remove columns and configure your own columns for the parameters that you want to see and edit.

- To add a column, right-click the column header and select the element you want to show.
- To remove a column, right-click the column header and deselect the element.
- To add a particular zone parameter as a column, right-click the column header, select **Learn Zone Parameter**, open the editor for the zone, and click the parameter that you want to add as a column.

## Sorting the Program Tree Elements

The layers and zones in the **Program Tree** can be sorted according to columns. The triangle in the header of a column indicates that items are sorted by this column.

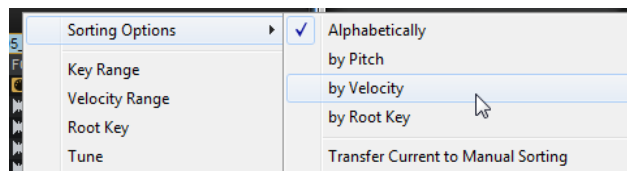
- To activate the sorting for a column, click its header.
- To change the sorting between ascending and descending order, click the header again.
- To deactivate the sorting via the column, click a third time.

If column sorting is not activated, you can change the order of elements manually using drag and drop.

## Name Column Sorting Options

By default, the **Name** column is sorted in alphabetical order. However, you can also sort this column by **Pitch**, by **Velocity**, and by **Root Key**.

For example, if you have imported multiple sample zones, you might want them to be sorted according to their pitch rather than their name.



- To change the sorting, right click a column header to open the context menu, and select an option from the **Sorting Options** submenu.

#### NOTE

The **Sorting Options** can only be applied if the zones contain the corresponding information.

---

## Permanently Applying Your Sorting Options

You can make your **Sorting Options** settings permanent. This is useful if you want to keep your sorting settings even if sorting by columns is deactivated or if you want to change the sorting for the program or a layer higher up in the hierarchy, for example.

---

### PROCEDURE

1. Select the program or the layer that contains the zones that you want to sort differently. To change the sorting order of all zones, select the program.
2. Right-click the column header, open the **Sorting Options** submenu and select an option.
3. Open the **Sorting Options** submenu again and select **Transfer Current to Manual Sorting**.

---

### RESULT

This applies your settings permanently. If you now change the **Sorting Options** settings or deactivate column sorting, this will not affect the settings that you made for the selected program or layer.

### NOTE

**Transfer Current to Manual Sorting** can only be applied to programs or layers.

---

## Program Tree Context Menu

The context menu contains options and commands for the **Program Tree** elements.

### NOTE

The available options depend on the selected element. For example, **Copy Zone Settings** is only available for zones.

---

Expand Tree	
Collapse Tree	
Selection	>
New	>
Load/Save	>
Import/Export	>
Delete	Backspace
Rename	F2
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Paste to New Layer	
Copy Zone Settings	
Paste Zone Settings to Selection	
Open Editor	Ctrl+E
Open Sample Editor	Ctrl+Shift+E
Search and Rename	
Visibility	>
Mute/Solo	>
Streaming	>
Mapping	>
Fill Gaps	>
Set Root Key	>
Transfer Settings to Mapping	>
Apply Layer Settings to Zones	>
Set Bus Type	>
MIDI Module Library	>

### Expand All/Collapse All

Expands/Collapses all elements of the **Program Tree**.

#### NOTE

These options are only available if no element is selected.

---

### Expand Tree/Collapse Tree

Expands/Collapses the selected element.

### Selection

- To select the entire content of a program, choose **Select All**.
- To select all elements that were previously not selected, and to deselect all elements that were previously selected, select **Invert Selection**.

#### NOTE

This function applies to elements of the same type that belong to the same hierarchy. For example, layers that are all sub-elements of a program, or busses that are part of the same layer.

---

- To select all sub-entries of an element, choose **Select Tree**.

### New

This submenu allows you to add a new layer, zone, bus, MIDI module, or audio effect.

#### NOTE

Some elements can only be added at specific positions. For example, audio effects can only be added to busses.

---

### Load/Save

Allows you to load/save **Program Tree** elements. The available options depend on the selected element.

- **Replace Program/Layer** allows you to replace the current program/layer.
- **Load to New Layer** allows you to select a new program/layer and add it to the active program at the current hierarchy position.
- **Save Program** saves the active program.

#### NOTE

Factory content cannot be overwritten. If you try to save a factory program, the **Save Program As** dialog opens, allowing you to save the program to your user content folder or to the specified folder in your system.

---

- **Save Program As/Save Layer As** allows you to save the current program or layer in your user content folder or the specified folder in your system.
- **Save Layer As Program** allows you to save the selected layer as a program in your user content folder or the specified folder in your system.
- **Revert to Last Saved Program** discards all changes that you made since you last saved the program.

### Import/Export

- **Import VST 3 Preset** opens a dialog, where you can select and load a VST 3 preset.
- **Export Program/Layer as VST 3 Preset** allows you to set up attributes for the selected program or layer and to export it as a VST 3 preset.

Activate **Export Files** to include all the files in the VST 3 preset.

Activate **Protect** to export the program or layer as a protected VST 3 preset.

Activate **As HALion Sonic Layer** to export the selected program or layer as a HALion Sonic layer preset. These presets can then be loaded by HALion Sonic as layers or as programs.

- **Import Folder** allows you to import a folder containing samples or subfolders with samples.
- **Import Samples** allows you to import samples.
- **Export Samples** allows you to export samples.
- **Replace Samples** allows you to exchange one or multiple samples that are used to play back one or multiple zones. Any zone-specific settings like **Pitch**, **Filter**, or **Amplifier** are not modified by this.
- **Change Sample Folder** allows you to relocate samples. This is useful when processing samples and saving them in a new location without changing their names.
- **Find Missing Samples** opens a dialog that allows you to search for missing samples.

### **Delete**

Deletes the selected element from the **Program Tree**.

If the element is a sample, it is only deleted from the tree, not from the hard disk.

### **Rename**

Allows you to rename the selected element.

### **Cut**

Removes the selected element from the list and saves it to the clipboard.

### **Copy**

Copies the selected element to the clipboard.

### **Paste**

Pastes the element from the clipboard to the selected program or layer.

### **Paste to New Layer**

Allows you to paste one or several copied elements to a new layer within a zone, to a layer, or to the program, depending on where you click to open the context menu.

### **Copy Zone Settings**

Copies the settings of the selected zone to the clipboard.

### **Paste Zone Settings to Selection**

Pastes the zone settings from the clipboard to the selected element in the **Program Tree**.

### **Open Editor**

Opens the editor for the selected layer, zone, effect, MIDI module, or bus in a separate window. For example, the **MIDI Modules Editor** opens for MIDI modules, while the **Sound Editor** opens for programs and layers.

The key command for this function is specified via the **Edit** command in the **Edit** category of the **Key Commands** dialog.

### **Open Sample Editor**

Allows you to open a sample zone in the **Sample Editor**.

### **Open Wavetable Editor**

Allows you to open a wavetable zone in the **Wavetable Editor**.

### **Search and Rename**

Allows you to perform a search and rename operation on the selected element or on all elements in the **Program Tree**.

### **Visibility**

- **Hide Selected** hides the selected elements.
- **Hide Non-Selected** hides all elements that are not selected.
- **Show Selected** shows all selected elements.
- **Hide All** hides all elements.
- **Show All** shows all elements.
- If **Auto Visibility** is activated, the selected zones and any of their direct siblings that are part of the same layer are automatically shown. Other zones are hidden. If this option is activated, you can still switch the visibility of zones inside the layers.

### **Mute/Solo**

- **Mute All Zones** mutes all zones.

The program itself and any of its layers are not muted.

- **Solo All Zones** solos all zones.  
The program itself and any of its layers are not soloed.
- **Mute Selected Zones** mutes the selected zones.
- **Solo Selected Zones** solos the selected zones.
- **Make All Zones Audible** resets the mute and solo states for all zones.
- **Solo Follows Selection** automatically solos the layers and zones that you select.  
The other elements of the program are muted.  
This is useful if you want to switch between layers and zones and only play back the current selection.

### Streaming

Allows you to choose between two streaming settings for the selected sample:

- **Play from RAM**
- **Remove Completely from RAM**

### Mapping

Allows you to set up the mapping for the selected sample.

### Fill Gaps

- **Pitch Only** fills any gaps between the selected zones on the keyboard axis.
- **Velocity Only** fills any gaps between the selected zones on the velocity axis.
- **Pitch and Velocity** first fills the gaps on the keyboard axis. Afterwards, the remaining gaps on the velocity axis are filled.
- **Velocity and Pitch** first fills the gaps on the velocity axis. Afterwards, the remaining gaps on the keyboard axis are filled.

### Set Root Key

Allows you to adjust the root keys of the selected zones without changing their key or velocity ranges.

- **Center of Zone** sets the root key to the center of the zone. If the zone has no center because it has an even number of keys, the root key is set to the key in the center that is closest to the previous root key.
- **High Key of Zone** sets the root key to the **High Key** of the zone.
- **Low Key of Zone** sets the root key to the **Low Key** of the zone.
- **Key Text in Sample Name** sets the root key to the key that is extracted from the sample file name. The function searches for the name of the key in text form.
- **Key Number in Sample Name** sets the root key to the MIDI note number that is extracted from the sample file name. The function searches for a number.
- **Root Key in Sample File** sets the root key to the key that is stored in the header chunk of the sample file.

### Transfer Settings to Mapping

Zones often have varying **Fine Tune** and **Level** settings, while sharing various other settings. To avoid varying **Fine Tune** and **Level** settings, you can transfer these settings to the **Tune** and **Gain** parameter in the **Mapping Editor**.

- **Select All** transfers the **Fine Tune** and **Level** settings at the same time.
- **Fine Tune** and **Level** allow you to transfer the parameters separately.

Afterwards, the zone settings are reset to their default values.

### Apply Layer Settings to Zones

It can be helpful to apply the layer settings to the zones they contain.

For example, if a program contains layers that are limited to a specific key range but that contain zones that use the full key range, all these zones fill the whole key range in the **Mapping Editor**, and it is impossible to see their real limitations.

To solve this, select **Apply Layer Settings to Zones > Key Range** to make the zones inherit the limits of the layers. You can either apply all settings at once or apply the settings for **Key Range**, **Velocity Range**, **Fine Tune**, **Level**, and **Pan** separately.

### Set Bus Type

Allows you to change the bus type. You can convert a regular audio bus into an AUX bus, or vice versa. This is particularly useful if you have added effects for a bus and want to change the bus type while keeping the effects.

### MIDI Module Library

Allows you to save your script modules as MIDI modules. These modules are then treated just like other MIDI modules in HALion, that is, they appear in the MIDI modules list on the toolbar, they can be opened in the **MIDI Modules Editor**, etc.

#### RELATED LINKS

[Exporting Programs and Layers as VST 3 Presets with Files](#) on page 322

[Mapping Editor](#) on page 93

[Search and Rename Dialog](#) on page 328

## Color Scheme

The color of the icons for program, layers, and zones offer additional information.

- Light gray – Light gray is the standard color for zones. For sample zones, this color means all samples were found and loaded without problems.
- Red – If an icon is red, samples could not be found, for example, because a removable hard drive is not connected.
- Yellow – If an element is incomplete, for example, if a sample zone is not linked to a sample, this is indicated by a yellow icon.
- Light blue – To reduce hard-disk load, HALion can play back samples from RAM only. To indicate this, the icons of the corresponding sample zones turn light blue.
- Magenta – To free memory on your computer, you can remove the samples completely from RAM. The samples are played back from the hard disk only. To indicate this, the icons of the corresponding sample zones turn magenta.

## Importing Samples

You can manually select samples to import or you can import complete folders containing samples.

When importing samples, HALion uses a default zone preset that sets all zone parameters to the default values, but excludes the sample-specific parameters. You can modify this preset in the **Sound Editor** for a zone and save it as Default to your user preset directory. HALion then uses this preset when importing samples.

#### CHOICES

- To import samples, right-click the program or one of its layers, and select **Import/Export > Import Samples**.
- To import a folder containing samples or subfolders with samples, right-click the program or one of its layers, and select **Import/Export > Import Folder**.

Usually, sample collections are organized in folder structures, where each velocity layer or each key group is saved in a separate folder. You can create layers that correspond to the hierarchy of the subfolders on disk, by activating **Create Layers from Subfolders**.

---

#### RELATED LINKS

[Import Samples Dialog](#) on page 306

## Import Samples Dialog

In the **Import Samples** dialog, you can prelisten the samples before import and set up the **Mapping Options**.

- To open the **Import Samples** dialog, right-click a program or layer in the **Program Tree** and select **Import/Export > Import Samples**.

### Prelisten Controls

These controls allow you to listen to the samples before you import them.



#### Level

Adjusts the playback level.

#### Play

Plays back the focused file.

#### Stop

Stops playback. The playback cursor jumps back to the start of the file.

#### Pause

Pauses playback. Click again to resume playback.

#### Auto Play

Automatically starts playback of the focused file.

#### Loop Playback

If this button is activated, the focused file is played back repeatedly.

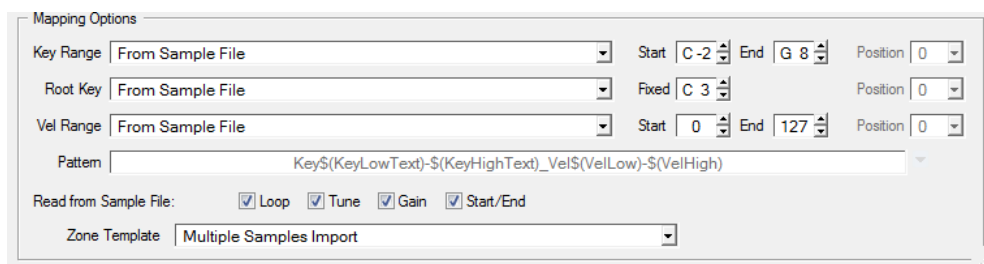
#### Play Position

The play position indicator shows the playback position within the focused file. To select another position for playback, click on the slider, or drag the handle.

## Mapping Options

In the **Mapping Options** section, you can specify how to map the samples and you can extract mapping information from sample file and folder names.





## Key Range

### From Sample File

The samples are mapped to the key range that is saved in the file header of the sample. If the header does not contain any key range information, the **Start** and **End** values are used.

### Text from Sample Name

The samples are mapped to the key range that is extracted from the name of the sample. This function searches for a key range that is defined in text form, for example Sample\_Name\_B2-C#3.

### Number from Sample Name

The samples are mapped to the key range that is extracted from the name of the sample. This function searches for MIDI note numbers, for example Sample\_Name\_59-61.

#### NOTE

Only values between 0 and 127 can be extracted as MIDI note numbers.

### From Sample Name Pattern

The samples are mapped to the key range that is extracted from the name of the sample, according to the specified name pattern.

### Root Key Only

Each sample is mapped to its root key only.

### Root Key Fill Centered

The samples are mapped to their root key. The zones expand to the left and right from the root key to fill empty spaces.

### Root Key Fill Up

The samples are mapped to their root key. The zones expand to the right to fill empty spaces.

### Root Key Fill Down

The samples are mapped to their root key. The zones expand to the left to fill empty spaces.

### Chromatic

The samples are mapped chromatically to the white and black keys in ascending order, starting at the key specified with the **Start** value.

### White Keys

The samples are mapped to white keys in ascending order, starting at the key you set with the **Start** value.

### **Black Keys**

The samples are mapped to black keys in ascending order, starting at the key you set with the **Start** value.

### **Fixed**

The samples are mapped to the key range that you specify with the **Start** and **End** values.

#### NOTE

The **Chromatic**, **White Keys** and **Black Keys** options alter the root key. All other options map the root key according to the **Root Key** settings.

---

## **Root Key**

Allows you to specify how the root key for the samples is obtained.

### **From Sample File**

The root key is read from the file header.

### **Text from Sample Name**

The root key is extracted from the file name. This function searches for root key information in text form, for example Sample\_Name\_C#3.

### **Number from Sample Name**

The root key is extracted from the file name. This function searches for MIDI note numbers, for example Sample\_Name\_61.

#### NOTE

Only values between 0 and 127 can be extracted as MIDI note numbers.

---

### **From Sample Name Pattern**

The root key is extracted from the sample file name, according to the specified name pattern.

### **Fixed**

The root key is set to a fixed key, specified in the field to the right.

#### NOTE

If no root key information is found, the fixed root key is used.

---

## **Velocity Range**

If no information on the velocity range is found, the samples are mapped to the range that you specify with the **Start** and **End** values.

### **From Sample File**

The samples are mapped to the velocity range saved in the file header.

### **From Sample Name**

The samples are mapped to the velocity range that is extracted from the file name.

### **From Sample Name Pattern**

The samples are mapped to the velocity range that is extracted from the file name, according to the specified name pattern.

### From Folder Name

The samples are mapped to the velocity range that is extracted from the name of the folder in which the samples reside.

### Layered

The samples are layered, that is, they are distributed evenly over the velocity range.

### Fixed

The samples are mapped to the velocity range that you specify with the **Start** and **End** values.

## Position

The **Position** setting for the key range, the velocity range, and the root key determines the position in the file name at which the program searches for the information.

- If this is set to 0, the entire file name is searched.
- To start the search after a specific number of characters, select the number from the pop-up menu.

### NOTE

Every character is taken into account, including spaces.

---

## Name Patterns

Depending on the mapping settings, the information for root key, key range, and velocity range is retrieved differently for file and folder names.

Usually, names of sample files follow a certain naming scheme, for example, Sample\_C3\_Key\_59-61\_Vel\_80-100. You can extract all this information from the sample file name by selecting **From Sample Name Pattern** on the **Key Range**, **Root Key**, or **Vel Range** pop-up menus and defining a pattern in the lower part of the **Mapping Options** section. You can use the **Pattern** field to manually edit your pattern and select variables from the pop-up menu on the right.

### Key Low Number \$(KeyLow)

The MIDI note number is extracted and is used as the lower limit of the key range.

### Key High Number \$(KeyHigh)

The MIDI note number is extracted and is used as the upper limit of the key range.

### Key Low Text \$(KeyLowText)

The note name is extracted and is used as the lower limit of the key range.

### Key High Text \$(KeyHighText)

The note name is extracted and is used as the upper limit of the key range.

### Velocity \$(Velocity)

The number for the velocity value is extracted and is used as the lower and upper limit of the velocity range.

### TIP

After the import, use **Fill Gaps > Velocity Only** to fill the empty space.

---

Tip:

#### **Velocity Low \$(VelLow)**

The number for the velocity value is extracted and is used as the lower limit of the velocity range.

#### **Velocity High \$(VelHigh)**

The number for the velocity value is extracted and is used as the upper limit of the velocity range.

#### **Root Key Number \$(RootKey)**

The MIDI note number is extracted and is used as the root key.

#### **Root Key Text \$(RootKeyText)**

The note name is extracted and is used as the root key.

#### NOTE

Samples can only be mapped correctly on import if all samples follow the same name pattern. If no matching pattern is found, the samples use the settings for the **Root Key**, and the **Start** and **End** values for the key range and the velocity range instead.

---

### **Read From Sample File**

The file header of a sample can contain information on the tuning, the gain, the loop, and start and end of the sample. On import, this information is retrieved as well.

To deactivate the reading of this information during import, deactivate the corresponding options in the **Read from Sample File** section.

### **Zone Template**

In this section, you can specify which zone template to use. For example, this allows you to import multiple instrument samples including their headroom settings, because they are required for polyphonic playback.

## **Replacing Samples**

You can replace the samples that are used by your sample zones. This is useful if you have modified your samples in an external editor or converted them to another format, for example.

---

#### PROCEDURE

1. Select the zones for which you want to replace the samples.
2. Open the context menu for one of the zones, and select **Import/Export > Replace Samples**.
3. Select a method for replacing samples.
  - **Replace Identical Names** replaces the samples by new samples if their names are identical.

This is useful if you processed samples and saved them under the same name in a different location.
  - **Replace by Root Key** replaces the samples by new samples that have the same root key, regardless of the file name.
  - **Replace by Search Pattern** performs a search for the samples to replace the current samples.

This method can be used if parts of the sample name have changed, for example, due to processing or saving.

Enter the part of the name that has changed in the text field. Samples are replaced if the remaining parts of the sample name are identical. For example, if the name `Sample_Mix_1_C3.wav` has changed to `Sample_Mix_2_C3.aiff`, enter **\*Mix\_2\*.aiff** in the text field.

4. Locate the new samples.

The info text in the lower right section shows you how many samples are replaced in how many zones. If no samples are found, you must select another method for finding matching samples.

5. Optional: To listen to the samples before using them to replace the existing samples, activate **Prelisten Samples** and use your MIDI keyboard.

To listen to the samples with the correct pitch, select how to detect the root key of the new sample.

- **Root Key from Sample File** uses the root key that is saved in the file header of the sample file.
- **Root Key Text from Sample Name** extracts the root key from the sample file name. This function searches for the root key in text form.
- **Root Key Number from Sample Name** extracts the root key from the sample file name. This function searches for the root key as a MIDI note number.
- **Keep Zone Root Key** uses the root key of the zone. This option is only available when replacing a single sample.

6. Click **OK**.

---

## Exporting Samples

You can export multiple samples and make settings for them.

This allows you to do the following:

- Save the samples in the same directory.  
The new sample paths are written into a new program.
- Rename the samples and create a consistent name and folder structure.
- Write the **Tune** and **Gain Offset** settings from the **Mapping Editor** into the samples.
- Trim samples and apply fades and crossfades permanently.
- Write the mapping information into the file header or the file name.

---

### PROCEDURE

1. To export individual samples, select them and select **Export Samples** on the context menu.
2. In the **Export Samples** dialog, specify the location for the exported samples in the **Sample Path** field.

You can open the pop-up menu and use variables or click the button to the right of the field and navigate to the folder where you want to save the exported samples.

3. Specify the names for the samples in the **Sample Name** field. You can enter a name manually or use one or more variables from the pop-up menu.

In the **Example Name** and **Status Message** fields below, the results of your settings are shown. If some samples cannot be exported or if problems occur, a warning message is shown.

4. Specify the file format for the samples in the **File Format** section.

5. Optional: In the **Header Options** section, specify the zone settings that you want to include when saving the samples.
  6. Optional: Make settings in the **Audio Options** and **Export Options** sections.
  7. Click **OK**.
- 

#### RESULT

The samples are exported to the specified directory and edited according to your settings. If you have changed the sample paths, a new program is created that uses these new paths.

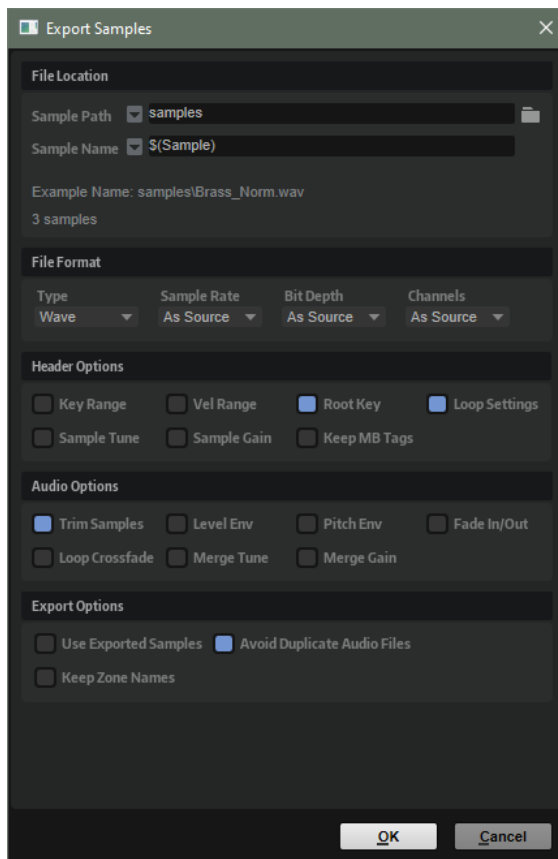
#### NOTE

Samples that are loaded from HSB files or protected VST Sound container files cannot be exported.

---

## Export Samples Dialog

In this dialog, you can make various settings for the exported samples. For example, you can specify the names and file paths for the samples, write specific information into the file header, and edit the samples by trimming them or by adding fades.



### File Location

#### Sample Path

Allows you to use variables to define the path where the samples are saved.

- **\$(SampleFolder)** creates a folder that has the same name as the folder in which the original samples were saved.

- **\$(LayerStructure)** creates folders following the structure of the selected program or layer.
- **\$(Layer)** creates a folder with the name of the layer.
- **\$(Program)** creates a folder with the name of the program.
- **\$(SampleRate)** creates folders that are named according to the sample rate of the samples.
- **\$(BitDepth)** creates folders that are named according to the bit depth of the samples.
- **\$(Date)** creates a folder with the name of the current system date in the format yymmdd.
- **\$(Time)** creates a folder with the name of the current system time in the format hhmm.

### Sample Name

Allows you to use variables to define how the exported samples are named.

- **\$(Sample)** uses the original file name of the sample.
- **\$(SampleFolder)** uses the name of the folder of the original samples.
- **\$(Zone)** uses the name of the zone.
- **\$(Layer)** uses the name of the layer.
- **\$(Program)** uses the name of the program.
- **\$(KeyLow)** uses the MIDI note number of the lower limit of the key range.
- **\$(KeyHigh)** uses the MIDI note number of the upper limit of the key range.
- **\$(KeyLowText)** uses the name of the note of the lower limit of the key range.
- **\$(KeyHighText)** uses the name of the note of the upper limit of the key range.
- **\$(VelLow)** uses the number of the lower limit of the velocity range.
- **\$(VelHigh)** uses the number of the upper limit of the velocity range.
- **\$(RootKey)** uses the MIDI note number of the root key.
- **\$(RootKeyText)** uses the name of the root key.  
For example, “\$(Sample)\_\$(RootKeyText)” appends the name of the root key to each sample file name.
- **\$(SampleRate)** uses the sample rate of the samples.
- **\$(BitDepth)** uses the bit depth of the samples.
- **\$(Date)** uses the system date in the format yymmdd.
- **\$(Time)** uses the system time in the format hhmm.

### Example name field

Shows the sample path and name resulting from your settings.

### Status message field

The status message field informs you how many samples are saved and whether duplicate names are created.

For example, if two zones in the **Program Tree** have the same name, and you use the variable **\$(Zone)**, this results in duplicate file names. In this case, the duplicate file names are automatically numbered.

NOTE

- Samples loaded from HSB files or protected VST Sound files cannot be exported. The status message informs you if such protected files exist.
  - Files that are in use cannot be overwritten. In this case, you must select a different location for the samples.
- 

NOTE

Some systems have problems with file names longer than 32 characters. Therefore, it is best to use file names that do not exceed this number.

---

## File Format

### Type

You can export the samples as Wave or AIFF files.

### Sample Rate

Allows you to specify the sample rate of the samples.

NOTE

Do not change the sample rate of looped samples, because this can cause audible artifacts.

---

### Bit Depth

Allows you to specify the bit depth of the samples.

### Channels

Allows you to specify the channels for the sample.

## Header Options

You can include zone settings when saving the samples. When you import these samples back into HALion, they automatically get these settings.

- **Key Range** saves the **Key Low** and **Key High** settings of each zone with the samples.
- **Vel Range** saves the **Velocity Low** and **Velocity High** settings of each zone with the samples.
- **Root Key** saves the **Root Key** setting of each zone with the samples.
- **Keep MB Tags** saves the **MediaBay** tags with the samples.
- **Loop Settings** saves the **Loop** settings of each zone with the samples.
- **Sample Tune** saves the **Tune** setting of each zone with the samples.
- **Sample Gain** saves the **Gain** setting of each zone with the samples.

## Audio Options

### Trim Samples

Trims the samples to their actual length, specified with the **Sample Start** and **Sample End** parameters of the zone.

### Level Envelope

If this option is activated, the level envelope specified in the **Sample Editor** is applied to the samples during export.



### Pitch Envelope

If this option is activated, the pitch envelope specified in the **Sample Editor** is applied to the samples during export.

### Fade In/Out

If this option is activated, the fade curves specified in the **Sample Editor** are applied to the samples during export.

### Loop Crossfade

If this option is activated, the loop crossfade is merged into the new sample. For the new sample, the crossfade time is reset to 0. This allows you to reduce the processing power that is needed for playback, because the crossfade does not need to be calculated in real time.

#### NOTE

- Merging the loop crossfade is best suited for **Continuous** and **Alternate Loop** mode, where the sample portion after the loop end is not played. Otherwise, the exported sample might not continue seamlessly after the merge.

If you want to merge the loop crossfades for samples that have with **Until Release** or **Alternate Until Release** mode, you must use release markers and set them up so that the loop end is not crossed.

- In **Alternate Loop** mode, the loop length in the exported sample is doubled, because it also contains the backward portion. **Loop Mode** is set to **Continuous**.

---

### Merge Tune

Activate this option to merge the **Tune** value into the new sample. For the new sample, the **Tune** value is reset to 0.

### Merge Gain

Activate the option to merge **Gain** value into the new sample. For the new sample, the **Gain** value is reset to 0.

## Export Options

### Use Exported Samples

Updates the sample references of the zones to use the exported samples.

### Avoid Duplicate Audio

Prevents samples that are used by several zones from being exported as duplicate audio files.

#### NOTE

If a sample has several zones and these zones have different loop settings, HALion creates duplicates of the file.

---

### Keep Zone Names

If this option is deactivated, zone names are replaced by the sample names. This is useful if you rename the samples during export.

If this option is activated, the exported zones keep their names.

## Exporting Programs and Layers with Samples

You can export a program or layer together with the corresponding samples as a VST preset.

---

### PROCEDURE

1. Select the program or layer and select **Import/Export > Export Samples**.
2. In the **Export Preset with Samples** dialog, specify a preset name in the **Preset File** field or click the button to the right of the field to open a dialog that allows you to navigate to the folder where you want to save the preset and to specify a name for it.
3. Specify the path in the **Preset Path** field.  
User presets are always saved in the user presets folder. In this field, you can specify or create a subfolder in which to save the preset.
4. Specify the location for the exported samples in the **Sample Path** field.  
You can open the pop-up menu and use variables or click the button to the right of the field and navigate to the folder where you want to save the exported samples.  
You can automatically create folders using variables for the sample path. Where necessary, complete the file path by typing in a backslash (Win) or a slash (Mac). You can combine several variables, separating them with hyphens, spaces, etc.
5. Specify the names for the samples in the **Sample Name** field. You can enter a name manually or use one or more variables from the pop-up menu.  
In the **Example Name** and **Status Message** fields below, the results of your settings are shown. If some samples cannot be exported or if problems occur, a warning message is shown.
6. Specify the file format for the samples in the **File Format** section.
7. Optional: Set up the **Header Options**, **Audio Options**, and **Export Options** sections.
8. Click **OK**.

### NOTE

Samples that are loaded from HSB files or protected VST sound files cannot be exported.

---

### RESULT

The VST preset is created at the specified location.

### NOTE

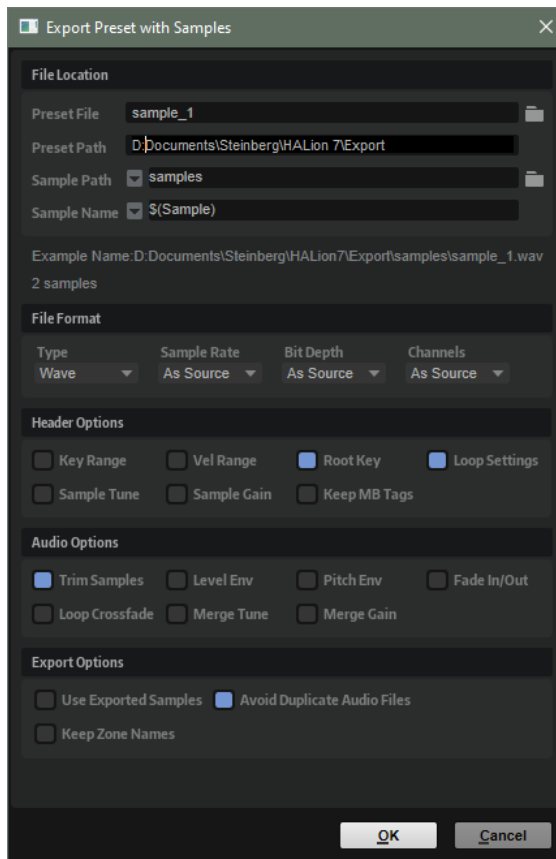
The VST preset also includes all resources, such as the macro page, bitmaps, fonts, scripts etc. This data is written into a folder that is saved in the same folder as the preset file. This way, you can move a preset to another system without losing any of the necessary components. If several presets are exported to the same location and if they share a macro page, the necessary resources are exported only once.

---

### RELATED LINKS

[Export Samples Dialog](#) on page 312

## Export Preset with Samples Dialog



### File Location

#### Preset File

The file name of the preset.

#### Preset Path

The path where the preset is saved.

#### Sample Path

Allows you to use variables to define the path where the samples are saved.

- **\$(SampleFolder)** creates a folder that has the same name as the folder in which the original samples were saved.
- **\$(LayerStructure)** creates folders following the structure of the selected program or layer.
- **\$(Layer)** creates a folder with the name of the layer.
- **\$(Program)** creates a folder with the name of the program.
- **\$(SampleRate)** creates folders that are named according to the sample rate of the samples.
- **\$(BitDepth)** creates folders that are named according to the bit depth of the samples.
- **\$(Date)** creates a folder with the name of the current system date in the format yymmdd.
- **\$(Time)** creates a folder with the name of the current system time in the format hhmm.

### Sample Name

Allows you to use variables to define how the exported samples are named.

- **\$(Sample)** uses the original file name of the sample.
- **\$(SampleFolder)** uses the name of the folder of the original samples.
- **\$(Zone)** uses the name of the zone.
- **\$(Layer)** uses the name of the layer.
- **\$(Program)** uses the name of the program.
- **\$(KeyLow)** uses the MIDI note number of the lower limit of the key range.
- **\$(KeyHigh)** uses the MIDI note number of the upper limit of the key range.
- **\$(KeyLowText)** uses the name of the note of the lower limit of the key range.
- **\$(KeyHighText)** uses the name of the note of the upper limit of the key range.
- **\$(VelLow)** uses the number of the lower limit of the velocity range.
- **\$(VelHigh)** uses the number of the upper limit of the velocity range.
- **\$(RootKey)** uses the MIDI note number of the root key.
- **\$(RootKeyText)** uses the name of the root key.

For example, “\$(Sample)\_\$(RootKeyText)” appends the name of the root key to each sample file name.

- **\$(SampleRate)** uses the sample rate of the samples.
- **\$(BitDepth)** uses the bit depth of the samples.
- **\$(Date)** uses the system date in the format yymmdd.
- **\$(Time)** uses the system time in the format hhmm.

### Example name field

Shows the sample path and name resulting from your settings.

### Status message field

The status message field informs you how many samples are saved and whether duplicate names are created.

For example, if two zones in the **Program Tree** have the same name, and you use the variable **\$(Zone)**, this results in duplicate file names. In this case, the duplicate file names are automatically numbered.

#### NOTE

- Samples loaded from HSB files or protected VST Sound files cannot be exported. The status message informs you if such protected files exist.
- Files that are in use cannot be overwritten. In this case, you must select a different location for the samples.

---

#### NOTE

Some systems have problems with file names longer than 32 characters. Therefore, it is best to use file names that do not exceed this number.

---

## File Format

### Type

You can export the samples as Wave or AIFF files.

### Sample Rate

Allows you to specify the sample rate of the samples.

#### NOTE

Do not change the sample rate of looped samples, because this can cause audible artifacts.

---

### Bit Depth

Allows you to specify the bit depth of the samples.

### Channels

Allows you to specify the channels for the sample.

## Header Options

You can include zone settings when saving the samples. When you import these samples back into HALion, they automatically get these settings.

- **Key Range** saves the **Key Low** and **Key High** settings of each zone with the samples.
- **Vel Range** saves the **Velocity Low** and **Velocity High** settings of each zone with the samples.
- **Root Key** saves the **Root Key** setting of each zone with the samples.
- **Keep MB Tags** saves the **MediaBay** tags with the samples.
- **Loop Settings** saves the **Loop** settings of each zone with the samples.
- **Sample Tune** saves the **Tune** setting of each zone with the samples.
- **Sample Gain** saves the **Gain** setting of each zone with the samples.

## Audio Options

### Trim Samples

Trims the samples to their actual length, specified with the **Sample Start** and **Sample End** parameters of the zone.

### Level Envelope

If this option is activated, the level envelope specified in the **Sample Editor** is applied to the samples during export.

### Pitch Envelope

If this option is activated, the pitch envelope specified in the **Sample Editor** is applied to the samples during export.

### Fade In/Out

If this option is activated, the fade curves specified in the **Sample Editor** are applied to the samples during export.

### Loop Crossfade

If this option is activated, the loop crossfade is merged into the new sample. For the new sample, the crossfade time is reset to 0. This allows you to reduce the processing power that is needed for playback, because the crossfade does not need to be calculated in real time.

NOTE

- Merging the loop crossfade is best suited for **Continuous** and **Alternate Loop** mode, where the sample portion after the loop end is not played. Otherwise, the exported sample might not continue seamlessly after the merge.

If you want to merge the loop crossfades for samples that have with **Until Release** or **Alternate Until Release** mode, you must use release markers and set them up so that the loop end is not crossed.

- In **Alternate Loop** mode, the loop length in the exported sample is doubled, because it also contains the backward portion. **Loop Mode** is set to **Continuous**.
- 

### Merge Tune

Activate this option to merge the **Tune** value into the new sample. For the new sample, the **Tune** value is reset to 0.

### Merge Gain

Activate the option to merge **Gain** value into the new sample. For the new sample, the **Gain** value is reset to 0.

## Export Options

### Use Exported Samples

Updates the sample references of the zones to use the exported samples.

### Avoid Duplicate Audio

Prevents samples that are used by several zones from being exported as duplicate audio files.

NOTE

If a sample has several zones and these zones have different loop settings, HALion creates duplicates of the file.

---

### Keep Zone Names

If this option is deactivated, zone names are replaced by the sample names. This is useful if you rename the samples during export.

If this option is activated, the exported zones keep their names.

### RELATED LINKS

[Export Samples Dialog](#) on page 312

## Exporting Programs and Layers as HALion Sonic Layer Presets

By exporting programs or layers as HALion Sonic layer presets, you can ensure that HALion Sonic loads them correctly. This is particularly useful if you create content as part of a VST Sound container, because it allows you to verify that the preset contains all necessary resources.

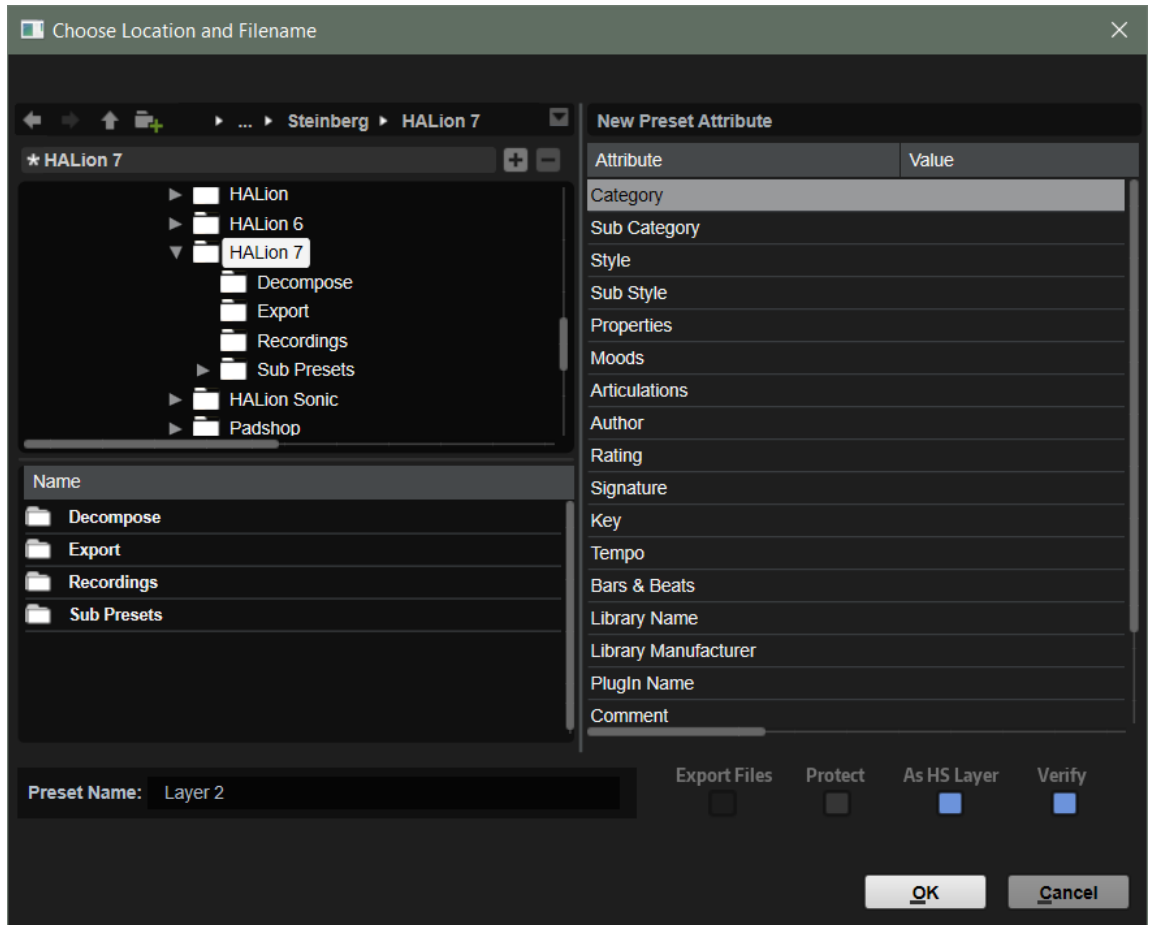
### PREREQUISITE

HALion Sonic layers require a macro page that can be controlled from within HALion Sonic. Without a macro page, the program can be loaded and played but not edited.

The macro page must be attached to the exported layer. Macro pages that are attached to sublayers cannot be accessed in HALion Sonic.

#### PROCEDURE

1. Right-click the program or layer, and select **Import/Export > Export Program/Import/Export > Export Layer**.



2. In the dialog, specify a file name and a location for the preset, set up the attributes, and activate **Export As HALion Sonic Layer**.
3. Optional: Click **Verify HALion Sonic Layer Structure** to check the layer for compatibility with the layer structure that is used in HALion Sonic.
4. Click **OK**.

If **Verify HALion Sonic Layer Structure** is activated and HALion Sonic detects incompatibilities, it informs you about them via a warning message.

- Click **Cancel** to cancel the export.
- Click **Continue** to export the layer, regardless of the incompatibilities.
- Click **Fix** to automatically correct the detected incompatibilities and to resume the export.

If an issue cannot be fixed, the warning message is opened again, without the **Fix** button.

---

#### RESULT

The preset is written into the specified folder and can be accessed via the **MediaBay**.

## Exporting Programs and Layers as VST 3 Presets with Files

You can export a program or layer, including all of its files, to a new directory. This enables you to use your programs or layers on another computer.

---

### PROCEDURE

1. In the **Program Tree**, right-click the program or layer, and select **Import/Export > Export Program as VST 3 Preset/Import/Export > Export Layer as VST 3 Preset**.
2. In the dialog, specify a name and a location for the files and set up the attributes.
3. Activate **Export Files**, and click **OK**.

---

### RESULT

HALion creates a VST 3 preset and several folders in the specified directory. These folders contain all the resources required by the program.

### NOTE

This function is also useful if you are collaborating with others on a library because it allows you to create a working directory. For more information, consult the section **Guidelines > Using Relative Paths** at <https://developer.steinberg.help>.

---

### AFTER COMPLETING THIS TASK

To use an exported preset, you need to load it.

## Sliced Loop Import

You can import sliced loops in the REX1 and REX2 formats or drag and drop sliced events directly from Cubase.

### NOTE

Before importing a loop, make sure that the very last event ends with the loop end and not before. Otherwise, the generated loop is too short and will not play in a perfect cycle.

## Importing REX Loops

The import process for REX files includes several steps. First, the slice information is used to create a sample zone for each slice. These sample zones are then mapped to the keyboard. The range starts with C3 and uses as many zones as slices are defined in the loop. The slice information is also used to create a MIDI phrase that is loaded into a Slice Player module.

---

### CHOICES

- Drag a REX file from the File Explorer/macOS Finder to the **Program Tree** and drop it on a program or layer.
- Open the context menu for a program or layer, select **Import/Export > Import Samples**, and select the file that you want to import.

### NOTE

HALion can directly play back REX1 audio files. For REX2 files, HALion first extracts a WAV file and saves it in the same folder as the REX file.

---



## Importing Sliced Audio Events from Cubase

You can import sliced audio events from Cubase using drag and drop.

### PROCEDURE

1. Drag a sliced audio event from Cubase onto the **Program Tree**.  
HALion recognizes that the event contains positional information for the different slices.
2. In the **Import Samples** dialog, click **Create Sliced Loop**.

### RESULT

HALion creates a sample zone for each slice and adds a slice player that contains the required MIDI information. Any further mapping options are ignored.

### NOTE

You can also drag selected audio events from a Cubase project to the **Program Tree** to create a sliced loop.

## Sliced Loop Playback

You can play back a loop at its original key or in a transposed version.

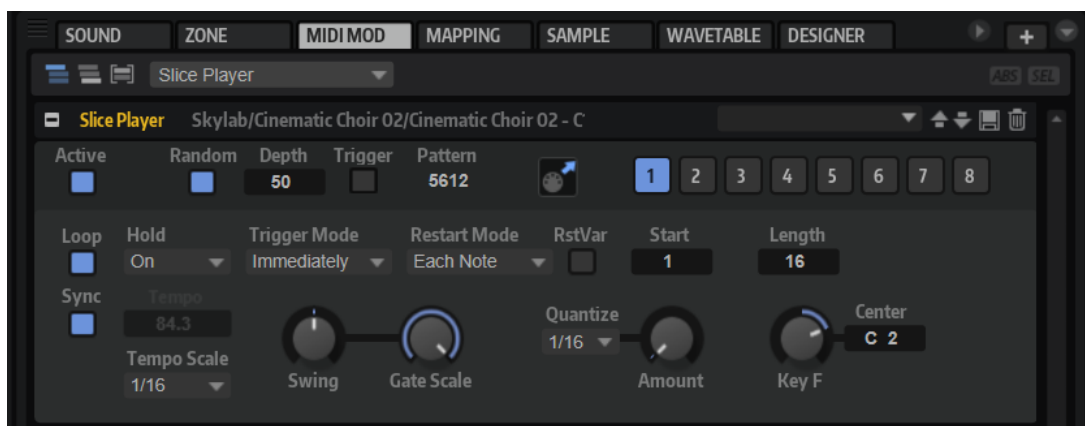
By default, the original loop is played using C2 (#48), but you can specify another key using the **Key Follow** and **Center Key** parameters. Pressing a key below C3 plays transposed versions of the original loop. The keyboard range above C3 provides the slice sample zones that are triggered by the slice player, but can also be triggered manually while the loop is playing.

If the REX file or audio event contains more than 128 slices, HALion automatically creates additional layers with MegaTrig modules that are preconfigured to use key switches. This way, you can create up to 1024 zones distributed over up to 32 layers.

## Slice Player

If you have created or imported sliced loops, the **Slice Player** becomes available in the **Program Tree**.

You can make settings for the **Slice Player** in the **MIDI Modules Editor**.



### Active

Activates the slice player.

### Random

If this button is activated, the slices are played back in random order. The timing is not affected by this.

- **Depth** adjusts how much the playing order of the slices is shuffled.  
Lower this value to keep the playing order of slices on the main beats. Raise this value to vary the playing order of slices on the offbeats as well.
- Click the **Trigger** button to trigger a new shuffle. Note that this changes the pattern number.
- The **Pattern** parameter allows you to use a specific random pattern, by entering its pattern number in the value field.

### MIDI Drag Icon

Drag this icon into the **Project** window of your Steinberg DAW to export the loop sequence as a MIDI part.

### Variation Buttons

With the parameters **Random, Tempo, Tempo Scale, Swing, Gate Scale, Quantize, Amount, Start, and Length**, you can set up 8 different variations of phrases and switch between them with the variation buttons.

You can remote-control the variation buttons using the trigger pads, which gives you the possibility to switch between variations by playing the trigger keys that are assigned to the trigger pads.

#### NOTE

To avoid that the variation switches in the middle of a beat or measure, use the trigger modes **Next Beat** or **Next Measure**.

---

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Trigger Mode

Determines at which moment the slice player scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the slice player continuously scans for new notes. The phrase changes immediately in reaction to your playing.
- If **Next Beat** is selected, the slice player scans for new notes at every new beat. The phrase changes in reaction to your playing on each new beat.
- If **Next Measure** is selected, the slice player scans for new notes at the start of new measures. The phrase changes in reaction to your playing on each new measure.

### Restart Mode

- **Off** plays the loop continuously and does not restart upon note changes.
- **First Note** restarts the loop when a note is triggered and no other notes are already held.
- **Each Note** restarts the loop each time that a note is triggered.
- **Sync to Host** aligns the loop with the beats and measures of your host application each time that you start the transport.

### RstVar (Restart on Variation Change)

If this button is activated, changing a variation restarts the slice player, even if no new notes were triggered.

NOTE

If **Sync** is activated, this option is not available.

---

### Start

Allows you to shift the start of the loop in steps of 1/4 notes. The length of the loop is shortened accordingly.

### Length

Allows you to shorten the length of the loop in steps of 1/4 notes.

NOTE

The control range of the parameters **Start** and **Length** varies, depending on the original length of the loop.

---

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the slice player. The playback speed of the phrase is specified in BPM.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100 %, the notes play with their original gate length.

#### NOTE

**Gate Scale** has no effect on samples that are played in **One Shot** mode. They always sound until the end.

---

### Quantize

Allows you to set up a quantization grid, in fractions of beats. You can also specify dotted and triplet values. This way, you can force the timing of the slices to play back only at the selected note value.

### Amount

Defines how much of the quantization grid is applied. A value of 100 % means the slices play back only at the specified **Quantize** note value. Lower values move the notes only partially towards the next **Quantize** note value. With a value of 0 %, no quantization is applied.

### Key Follow

Allows you to adjust the pitch modulation by note number. Set this parameter to positive values to raise the pitch with notes above the center key. Use negative values to lower the pitch with notes above the center key. At +100 %, the pitch follows the played note exactly.

#### NOTE

This parameter is limited to the keys that trigger the entire loop. It does not affect the keys that play the single slices.

---

### Center Key

This parameter determines the MIDI note that is used as the central position for the **Key Follow** function.

## Selections in the Program Tree

The selection in the **Program Tree** defines which part of the program can be edited in HALion.

All editors in HALion reflect the selection in the **Program Tree** and display the available parameters. The name of the selected entry is marked in blue. If several elements are selected, the one with the focus is available for editing. It is indicated by an orange frame around its name.

- To select an element, click on it.
- To select a range of elements, use **Shift** or **Ctrl/Cmd**.
- To select all zones within a layer, double-click one of the zones.
- To select all elements of a layer, double-click the layer.

#### RELATED LINKS

[Parameter List](#) on page 331

## Navigating in the Program Tree

If the **Program Tree** has the window focus, you can use the arrow keys for navigating between the elements.

---

### CHOICES

- If a single entry is selected, use the up and down arrow keys to select the previous or next entry.
  - To open or close a selected layer, use the right or left arrow key.
  - To expand the selection, use the up/down arrow keys while holding **Shift**.
  - If multiple entries are selected, use the up and down arrow keys to set the focus to the previous or next selected entry.
  - If the **Program Tree** does not have the window focus, you can use the keys **W**, **A**, **D**, and **X** to navigate in it: To select the previous or next element, press **W** or **X**, and to open or close the focused layer, press **D** or **A**, respectively.
  - If you are working with several separate windows that contain a **Program Tree**, the key commands are applied to the window that has the focus, provided that its lock icon is activated.
- 

## Setting Up the Program in the Program Tree

You can set up a program by adding elements such as modules, layers, or zones, and by structuring them in the **Program Tree**.

- To add elements to the program, use the buttons on the toolbar, or open the context menu and select the element that you want to add from the **New** submenu.
- To rearrange the program structure, drag the elements to a new position in the tree. To drag an element to another hierarchical level in the program, drag it onto the topmost element of this level.

### NOTE

The order of MIDI modules and insert effects determines the order of the processing. The topmost element is processed first, the lowest last.

- 
- To move or copy elements, open the context menu and use the **Cut**, **Copy**, and **Paste** commands.

You can also copy or move the selection from one program to another.

### NOTE

You can move a complete program into another one. In this case the moved program becomes a layer inside the target program.

---

## Renaming Elements

If you create a new element in the **Program Tree**, it gets a generic name.

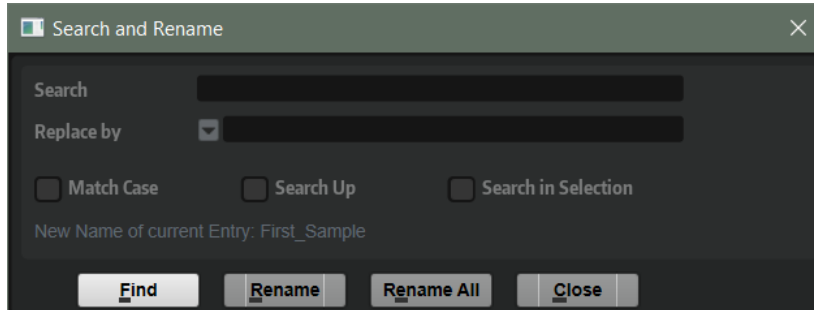
You can change this name in the following ways:

- Select the element, click it a second time, and enter a new name.
- Select the element, press **F2** (Win) or **Return** (Mac), and enter a new name.

## Search and Rename Dialog

You can perform a search and rename operation on selected or all elements in the **Program Tree**.

- To open the **Search and Rename** dialog, right-click anywhere in the **Program Tree** and select **Search and Rename**.



### Text Field for the Search

In the text field at the top of the dialog, you enter the word or phrase that you want to search for.

### Match Case

Activate this option to perform a case-sensitive text search.

### Search Up

If this option is activated, the search is performed on the elements that are higher-up in the **Program Tree** hierarchy.

### Search in Selection

If this option is activated, the search is performed only on the elements that are selected in the **Program Tree**.

### Replace by

Here, you enter the word or phrase that you want to replace the searched text with.

## Renaming Multiple Elements

You can search for words and phrases in the **Program Tree** and rename them.

---

### PROCEDURE

1. In the **Program Tree**, select the element that you want to rename. If nothing is selected, the search is performed on the entire program.
  2. Open the context menu and select **Search and Rename**.
  3. Enter the word or phrase that you want to search for.  
You can enter the entire word or phrase you are searching for, or you can use wildcards.
  4. Set up the search options to refine your search.  
You can specify the search direction or only search the selected elements, for example.
  5. Enter the text to replace the found words or phrases.  
You can also use text variables.
  6. Click the **Find** button to go to the next matching element in the **Program Tree**. Click the **Rename** button to rename the current element and to jump to the next match. Click **Rename All** to automatically rename all matching elements.
-

## Variables That Can Be Used for Renaming

Instead of entering the text to replace manually, you can also use the variables on the **Replace by** pop-up menu.

Sample File	\$(Sample)
Sample Folder	\$(SampleFolder)
Zone Name	\$(Zone)
Layer Name	\$(Layer)
Program Name	\$(Program)
Key Low Number	\$(KeyLow)
Key High Number	\$(KeyHigh)
Key Low Text	\$(KeyLowText)
Key High Text	\$(KeyHighText)
Velocity Low	\$(VelLow)
Velocity High	\$(VelHigh)
Root Key Number	\$(RootKey)
Root Key Text	\$(RootKeyText)
Date	\$(Date)
Time	\$(Time)
Counter	\$(Counter)

### **Sample File \$(Sample)**

The file name of the original sample.

### **Sample Folder \$(SampleFolder)**

The name of the folder where the sample is located.

### **Zone Name \$(Zone)**

The name of the zone.

### **Layer Name \$(Layer)**

The name of the layer.

### **Program Name \$(Program)**

The name of the program.

### **Key Low Number \$(KeyLow)**

The MIDI note number of the lower limit of the key range.

### **Key High Number \$(KeyHigh)**

The MIDI note number of the upper limit of the key range.

### **Key Low Text \$(KeyLowText)**

The note name of the lower limit of the key range.

### **Key High Text \$(KeyHighText)**

The note name of the upper limit of the key range.

### **Velocity Low \$(VelLow)**

The number of the lower limit of the velocity range.

### **Velocity High \$(VelHigh)**

The number of the upper limit of the velocity range.

### **Root Key Number \$(RootKey)**

The MIDI note number of the root key.

**Root Key Text \$(RootKeyText)**

The name of the root key.

**Date \$(Date)**

The system date (in the format yymmdd).

**Time \$(Time)**

The system time (in the format hhmm).

**Counter \$(Counter)**

A counter starting at 1, counting up for each replacement.

You can also use counter variables with up to 5 digits, where the counter starts with 01, 001, etc. These are not available on the menu. To use them, enter \$(Counter2), \$(Counter3), etc.

**IMPORTANT**

The variables \$(Sample), \$(SampleFolder), \$(Zone), \$(KeyLow), \$(KeyHigh), \$(KeyLowText), \$(KeyHighText), \$(VelLow), \$(VelHigh), \$(RootKey), and \$(RootKeyText) work only for zones. If you try to use any of these variables for replacing text in a layer name, the matching text is deleted. The variables \$(Program), \$(Layer), \$(Date), \$(Time) and \$(Counter) always work.

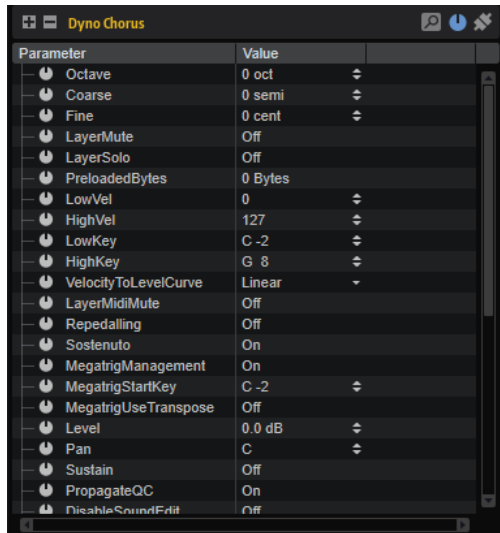
---



# Parameter List

The **Parameter List** gives you a detailed overview of the parameters of the element that is selected in the **Program Tree**.

For example, if you select an effect in the **Program Tree**, only the parameters of that effect are shown.



The **Parameter List** is also useful to get additional information about parameters, which is needed if you want to address parameters from a script, for example.

- If a parameter is connected to a macro page, the icon to the left of the parameter name changes. Additional information is shown at the bottom of the editor.

## Toolbar


Which tools are available on the toolbar depends on the element for which the **Parameter List** is opened.



### Expand All Nodes/Collapse All Nodes

Expands/Collapses all folders in the list.


### Follow "Switch off All Insert Effects"

Follow "Switch off All Insert Effects"  is available if an effect or a bus is selected in the **Program Tree**.

HALion and HALion Sonic provide global FX bypass buttons for all insert effects. In the **Parameter List**, you can set up whether or not an effect follows the global bypass.

If you deactivate **Follow "Switch off All Insert Effects"** for an effect, this effect is not bypassed when the global insert bypass button is activated. This can be useful during sound design, to integrate effects into a program that users are not supposed to identify as effects. For example, you might use an equalizer to correct the sound that you do not want to be switched off.

### Follow "Switch off All AUX Effects"

**Follow "Switch off All AUX Effects"**  is available if an effect or a bus is selected in the **Program Tree**.

HALion and HALion Sonic provide global FX bypass buttons for all AUX effects. In the **Parameter List**, you can set up whether or not an effect follows the global bypass.

If you deactivate **Follow "Switch off All AUX Effects"** for an effect, this effect is not bypassed when the global AUX bypass button is activated. This can be useful during sound design, to integrate effects into a program that users are not supposed to identify as effects.

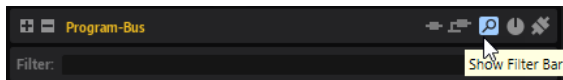
#### NOTE

If you use an additional internal effect signal routing that is independent from the global busses, you can link the internal bus to the global bypass button by activating **Follow "Switch off All AUX Effects"** for the AUX bus.

---

### Show Filter Bar

Allows you to display a filter bar below the toolbar.




To show only parameters that contain a specific text, enter this text in the text field. To show parameters that match multiple criteria, enter multiple text strings and separate them by spaces.

To take lower case and upper case into account, activate **Case Sensitive**.

To see only those parameters that fully match the search string between two separator letters ( \_ or - ), activate **Whole Words Only**.

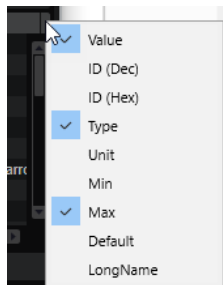
### Show Only Connected Parameters

To display only connected parameters in the list, activate **Show Only Connected Parameters** .

## Columns

You can add and remove columns in the **Parameter List** and change the column width by dragging the dividers.

By default, the **Parameter List** shows the **Parameter** and **Value** columns. To add additional columns to the **Parameter List**, right-click a column header, and select an item from the list.



### Parameter

Displays the names of the parameters. Parameters that belong to a specific section are grouped in folders, for example, the LFOs or the envelopes of a zone.

**Value**

Displays the values of the parameters.

You can change the values, depending on the type of parameter. For example, to change or add text, double-click in the value field, and enter the new text manually or copy it from the clipboard; to alternate between the states of an on/off button, click in the column.

**ID (Dec)**

Shows the parameter ID as a decimal value.

**ID (Hex)**

Shows the parameter ID as a hexadecimal value.

**Type**

Shows the value type, that is, **Integer**, **Float**, **String**, **Bool**, or **Data**.

**Unit**

Shows the unit of the parameter, that is, **%**, **Hz**, **dB**, **deg**, **cent**, **spi** (sample), **ms**, **BPM**, etc.

**Min**

Shows the minimum value for the parameter.

**Max**

Shows the maximum value for the parameter.

**Default**

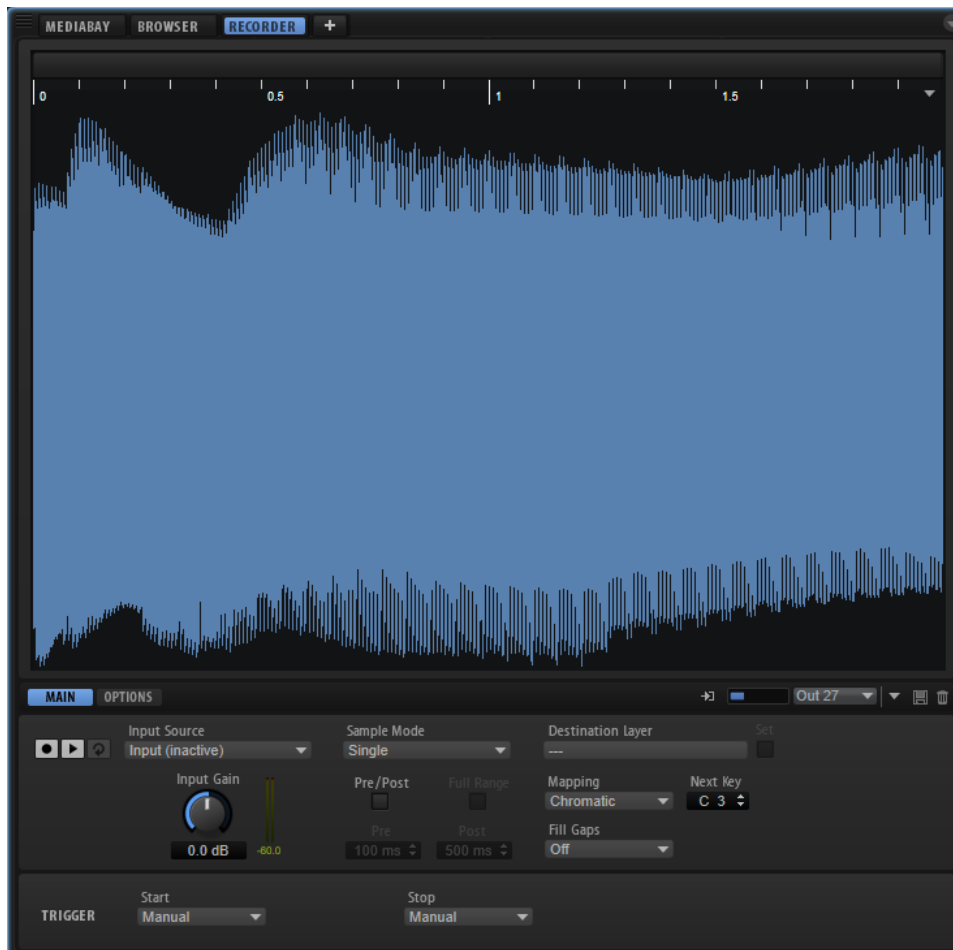
Shows the default value for the parameter.

**Long Name**

Shows the long name for the parameter.

# Sample Recorder

The **Sample Recorder** allows for live sampling in HALion. You can sample the sounds of another plug-in and map them to the keyboard, reduce CPU load by writing processing and fades directly in the sample file, or quickly create sounds from events in your sequencer projects and edit them further in HALion, for example.



The upper part of the **Sample Recorder** contains the waveform display.

The ruler above the display can be set to **Beats**, **Seconds**, or **Samples**.

During recording, the display shows the recorded waveform. When recording stops, the display shows the created sample zone. If nothing has been recorded yet, the waveform display shows the waveform of the sample zone that is selected in the **Program Tree**.

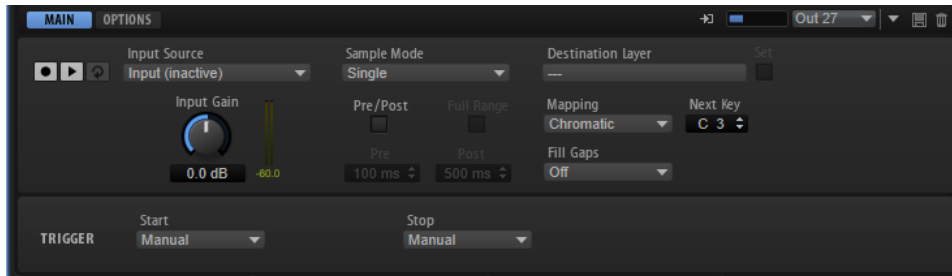
The lower part of the editor contains the **Main** and **Options** tabs.

## NOTE

The **Sample Recorder** is available once for a HALion instance.

## Main Tab

On the **Main** tab, you can make global settings for the recording, for example, set up **Input Source** and **Input Gain** and specify whether you want to record a single sample or multiple samples.



### Record/Record Enable

The behavior of this button depends on the **Record Start Trigger** setting.

- In **Manual** mode, this button starts/stops recording.
- In the **Audio Threshold**, **MIDI Note-On**, and **MIDI Note-Off** modes, this button record-enables the **Sample Recorder**. This means that recording starts as soon as the audio signal exceeds the threshold or a MIDI note-on or note-off event is received.

#### NOTE

The **Sample Recorder** always records the sample for the selected program or layer. Every recording creates a new sample zone.

---

### Play/Stop

The behavior of this button depends on the **Record Start Trigger** setting in the **Trigger** section.

- In **Manual** mode, the **Play/Stop** button starts/stops playback of the recorded sample.
- In the **Audio Threshold**, **MIDI Note-On**, and **MIDI Note-Off** modes, the **Play/Stop** button starts/stops recording.

### Reset Recording

Removes the current recording, allowing you to start over.

### Input Source

Allows you to select the source from which to record. You can use HALion's side-chain input, the output of one of the slots in HALion, or one of the plug-in outputs.

#### NOTE

Only the available options are shown on the menu, that is, outputs for empty slots or plug-in outputs that have not been activated are not shown.

---

### Input Gain

Adjusts the input level for the recording.

### Sample Mode

Determines whether you can make a single recording or record multiple samples.

- In **Single** mode, you can only record one sample.

- In **Auto-Next** mode, you can record multiple samples in a row. This is particularly useful when working with the **Audio Threshold**, **MIDI Note-On**, and **MIDI Note-Off** modes. Every time that recording is stopped, the **Sample Recorder** reverts to its record-enabled state and starts recording again as soon as the condition that triggers recording is met.

#### Destination Layer

This field displays the name of the layer into which the sample zone is recorded.

#### Set

Allows you to switch to another layer, even if **Record Enable** is active.

To switch to another layer, select it in the **Program Tree** and click **Set**.

#### Mapping

When you record multiple samples, you can specify how they are mapped.

- **As played** can be used when the recording start is triggered by MIDI notes. The played notes determine the root key of the sample.
- **Fixed** maps all samples to the key that is specified in the **Next Key** text field.
- **Chromatic** maps the samples chromatically to the keys on the keyboard, starting with the key that is specified in the **Next Key** text field.
- **White Keys** maps the samples to the white keys on the keyboard, starting with the key that is specified in the **Next Key** text field.
- **Black Keys** maps the samples to the black keys on the keyboard, starting with the key that is specified in the **Next Key** text field.

#### Next Key

Specifies the initial key or the fixed key for the sample mapping, depending on the selection you made on the **Mapping** pop-up menu.

#### Fill Gaps

Allows you to automatically map samples so that they are distributed over the keyboard. The available key range is from C-2 to G8.

- If **Off** is selected, the sample zone is mapped only to the root key of the sample.
- If **Fill Centered** is selected, the mapping of the sample zones is extended upwards and downwards halfway towards the adjacent sample zone. The mapping spans the entire keyboard range.
- If **Fill Up** is selected, the mapping of the sample zones is extended upwards until the next sample zone is reached.
- If **Fill Down** is selected, the mapping of the sample zones is extended downwards until the next sample zone is reached.

#### Pre/Post Record

Allows you to start the recording slightly ahead or let it continue for a bit after the recording stop trigger is received. This way, you can capture transients or reverb tails that are slightly lower than the set threshold, or perform fine-adjustments of the start and end regions of the sample at a later stage, for example.

- **Full Range** – If this option is activated, the pre- and post-record portions of the recording span the entire sample range.
- **Pre** sets the time that is recorded before the recording is triggered. The sample start marker of the zone is set to the exact trigger moment. The pre-record time can then be used to adjust the start of the sample.

- **Post** sets the time that is recorded after the trigger event has stopped the recording. The sample end marker of the zone is set to the exact trigger moment. The post-record time can then be used to adjust the end of the sample.

NOTE

When you record multiple samples, **Post Record** is automatically stopped 50 ms after a new sample recording has started, to avoid overlapping recordings.

---

### Record Start Trigger

Determines what starts the recording.

- If **Manual** is selected, recording starts when you click the **Record/Record Enable** button.
- If **Audio Threshold** is selected, recording starts as soon as the audio signal exceeds the specified threshold.
- If **MIDI Note-On** is selected, recording starts when a MIDI note-on event is received on the specified channel and port.
- If **MIDI Note-Off** is selected, recording starts when a MIDI note-off event is received on the specified channel and port.

### Record Stop Trigger

Determines what stops the recording.

- If **Manual** is selected, recording stops when you click the **Record/Record Enable** button.
- If **Audio Threshold** is selected, recording stops as soon as the audio signal falls below the specified threshold.
- If **MIDI Note-Off** is selected, the following applies:  
If **Trigger - Start** is set to **MIDI Note-On**, recording stops when the corresponding MIDI note-off is received on the specified channel and port.

NOTE

Only this specific note-off event stops the recording. Any other MIDI notes can be played and the resulting audio will be recorded.

---

If **Trigger - Start** is set to a setting other than **MIDI Note-On**, recording stops when a MIDI note-off event is received on the specified port.

- If **MIDI Note-On** is selected, recording stops when a MIDI note-on event is received on the specified channel and port.

NOTE

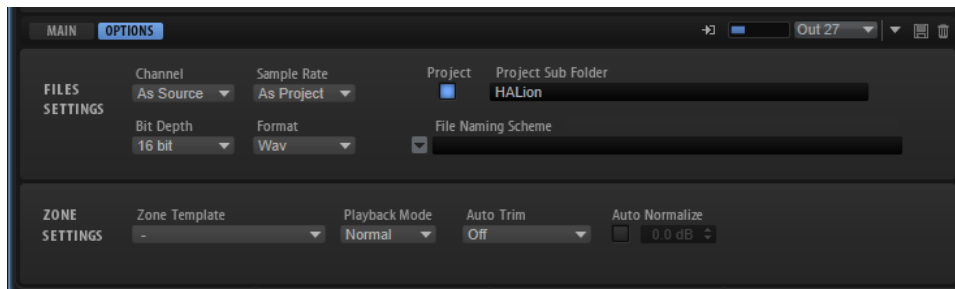
Any note that is sent on the specified channel and port stops the recording.

---

- **Fixed Duration** allows you to specify the duration for the recording, either as absolute recording time or as recording time in beats, in sync to the project tempo.

## Options Tab

On the **Options** tab, you can specify the sample format and the location for the recorded samples. Furthermore, you can define a naming scheme and make playback settings for the created sample zones.



### File Settings

#### Channel

- **As Source** adapts the number of channels automatically to the number of channels of the source.
- **Mono** records mono samples.

#### Sample Rate

Specifies the sample rate for recorded samples. You can choose between a selection of predefined sample rates or use the sample rate that is used in the project of your host application.

#### Bit Depth

Specifies the bit depth for the recorded samples.

#### Format

Specifies the file format for the recorded samples.

#### Project

Activate this button to record the sample files into the current project folder of the Steinberg DAW.

#### Record Folder

Allows you to specify the destination folder for the recorded sample files. If the **Project** button is activated, you can define a subfolder or path inside the project folder.

#### Naming Scheme

Allows you to set up a naming scheme for the recorded samples. The file name can be a combination of a text and a selection of predefined elements.

- You can enter the text for the file name in the text field.
- To add one of the predefined elements to the naming scheme, click the triangle to the left and select it from the pop-up menu.
- You can modify the naming scheme by cutting, copying, and pasting in the text field.

The resulting name is displayed as an example above the text field.



NOTE

To avoid duplicate file names, a continuous counter is automatically added to the file name.

---

## Zone Settings

### Zone Template

Allows you to select a zone template that is used to create new sample zones.

### Playback Mode

Specifies how the zone is played back.

- In **Normal** mode, the sample starts playing when a key is triggered and stops when the key is released.
- In **One Shot** mode, the sample is played back in its entirety, any note-off events are ignored.
- In **Loop** mode, the sample is played back in a loop. The loop is set up so that loop start and end correspond to the start and end of the sample.

### Auto Trim

**Zero Crossing** moves the sample start and end markers automatically to the nearest zero crossing before the start and after the end of the recording.

**Silence** automatically removes any silence before the audio starts and after it ends. The sample start and end markers are set accordingly.

### Auto Normalize

Allows you to normalize the audio of the recorded sample to the specified level.

NOTE

This operation is non-destructive and only affects the **Gain** parameter of the sample.

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#### RELATED LINKS

[Auto Trim](#) on page 339

## Auto Trim

How **Auto Trim** works depends on whether you start recording manually or automatically by specifying an audio threshold, for example.

---

#### EXAMPLE

##### Manual Recording

If you set **Auto Trim** to **Off**, manually start recording, and play a note on your instrument, the recording contains silence before and after the recorded audio. This means that you must adjust the sample start and end markers manually.

If you activate **Auto Trim**, the sample start and end markers are automatically set to positions directly before the start and after the end of the audio.

---

---

EXAMPLE

**Recording With an Audio Threshold and Pre/Post Record**

Set **Auto Trim** to **Off**, specify an audio threshold for both the start and the stop trigger for the recording, and activate and set up **Pre/Post Record**. Now, click the **Record/Record Enable** button to enable recording and play a note on your instrument.

As soon as the signal exceeds the **Start** threshold, recording starts and when the audio level falls below the **Stop** threshold, it ends.

The resulting recording contains silence before and after the audio recording. This means that you must adjust the sample start and end markers manually.

If you activate **Auto Trim** and repeat the same procedure, the sample start and end markers are automatically moved into the pre and post record range to match the effective start and end of the audio when the recording is finished.

**Auto Trim** only affects the sample start and end markers and leaves the audio file as it is, including the pre and post record time.

---

## Recording From an Audio Track That Contains Multiple Drum Sounds

Recording audio from a track in a Steinberg DAW allows you to save any processing, fades, etc. directly in the audio event.

---

PROCEDURE

1. In HALion, select the program for which you want to record the samples.
  2. Open the **Sample Recorder**.
  3. Set the **Next Key** field to the key on which you want the first sample to be recorded.
  4. In the plug-in header of HALion, activate the **Activate Side-Chain** button.
  5. On the **Input Source** pop-up menu, select **Input**.
  6. In the DAW, route the output of the audio track to the side-chain input of HALion.  
Alternatively, you can also add a send on the mixer channel of the audio track and route it to the side-chain input of HALion.
  7. In the **Sample Recorder**, set **Record Start Trigger** and **Record Stop Trigger** to **Audio Threshold** and specify the threshold levels.
  8. Set the **Sample Mode** to **Auto Next** to create multiple sample recordings.
  9. Set **Mapping** to **Chromatic** to map the zones automatically to the keys on the keyboard.
  10. Click the **Record/Record Enable** button to enable recording.
  11. In the Steinberg DAW, play back the audio track.  
As soon as the audio signal exceeds the **Start** threshold, the first sample recording starts. When the audio level falls below the **Stop** threshold, recording ends and the sample zone is created. The **Sample Recorder** automatically reverts to its record-enabled state and starts recording again as soon as the signal exceeds the threshold.
- 

RESULT

HALion creates a sample zone for each audio event on the track.

## Recording the Output of Another Plug-in

Recording the output of another plug-in allows you to save the sounds that you created with other plug-ins, software or hardware, exactly the way that you set them up. This can be particularly useful if a plug-in does not allow you to create presets, for example.

### PREREQUISITE

You have added two tracks in the Steinberg DAW, one for the plug-in from which you want to record, and one for HALion.

---

### PROCEDURE

1. In HALion, select the program for which you want to record the samples.
2. Open the **Sample Recorder**.
3. In the plug-in header of HALion, activate the **Activate Side-Chain** button.
4. Set the **Input Source** pop-up menu to **Input**.
5. Route the output of the instrument track to the side-chain input of HALion.  
Alternatively, you can also add a send on the mixer channel of the instrument track and route it to the side-chain input of HALion.
6. In HALion, set **Record Start Trigger** to **MIDI Note-On** and use the **Port** pop-up menu to specify a MIDI port and channel for the recording.
7. Set **Record Stop Trigger** to **MIDI Note-Off**.
8. Set **Sample Mode** to **Auto Next** to create multiple sample recordings.
9. Set **Mapping** to **As Played** to map the samples automatically to the keys that correspond to the notes on the source instrument track.
10. Copy the note events of the plug-in track to the HALion track, so that they both receive the same MIDI notes.
11. Click the **Record/Record Enable** button to enable recording.
12. Start playback in the DAW.

As soon as the first note-on message is received, recording starts. When the note is released, recording stops. The **Sample Recorder** automatically reverts to its record-enabled state and starts recording again as soon as the next note is received.

### NOTE

You can also record samples by playing the notes manually. In this case, proceed as described above, activate the **Record-Enable** and **Monitor** buttons for the plug-in track and the HALion track, so that you can trigger both tracks at the same time, and then play the notes on your keyboard.

---

### RESULT

HALion creates a sample zone for each MIDI note that is played.

## Monitoring the Input Signal

The **Sample Recorder** can play back the input signal. This is useful if you have routed an audio track from the DAW to the side-chain input of HALion. In this case, the signal of the track is no longer sent to the master bus of your sequencer and cannot be heard.

### NOTE

When you route a send from a track in the DAW to HALion's side-chain input, the original track remains audible and you do not need input monitoring.

---

The input monitoring controls are located on the right below the waveform display.



### PROCEDURE

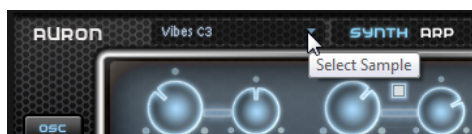
1. Activate **Enable Input Monitoring** to hear the signal at the input of the **Sample Recorder**.
  2. Specify the monitoring level with the fader.
  3. On the **Monitoring Output** pop-up menu, select an output for monitoring.
-

# Included Instruments

HALion comes with a factory library containing powerful instruments. For each instrument, an intuitive macro page is available, offering a rich palette of presets.

## Auron

The Auron synth uses granular synthesis with up to 8 grain streams to produce oscillator waveforms. With the integrated arpeggiator and step sequencer, you can create anything from sequencer lines to stepped chords.



You can select samples on the sample selector that is opened by clicking the little triangle in the upper left of the page.



The granular oscillator is followed by a multi-mode filter that offers a large number of different filter shapes. The filter can be modulated by modulation sources like the keyboard, velocity, and LFO, but also by the controller lanes of the step sequencer, for example.

Auron includes 2 LFOs. The first LFO can be synchronized to the tempo of the host application and allows for modulations of grain position, formant and duration, as well as filter cutoff. The second LFO is controlled by the modulation wheel and is used to create a vibrato.

For the grain synthesizer, three pages are available: **Osc**, **Mod**, and **Voice**. To open a page, click the corresponding button in the upper left of the Auron panel.

## Osc Page

On this page, you can make settings for the grain oscillator.

### Position

You can set the playback position of the grains manually. For example, at a setting of 50%, the playback position is in the middle of the sample. The playback position is updated with every new grain.

### Random Position

Selects a random playback position within a specific range around the current position. At a setting of 100%, the playback position jumps to a random position between the start and the end of the sample. The random playback position is calculated separately for each channel of the sample, at the start of a new grain. This can be used to widen the panorama of the sound.

### Duration

Increases the grain period by a factor ranging from 1 to 1000.

For very short grains, the sound is assigned the pitch of the frequency at which the grains repeat. For grains longer than 30 ms, the sound assumes the pitch of the original sample. This is the case for **Center Key** C3 if the **Duration** is set to a value above 10, for example.

### Random Duration

Sets the random grain duration. This duration is calculated at the start of a new grain.

### Duration Key Follow

Determines how the grain duration changes with the notes you play. It is mostly used with short durations. Longer durations sound with the original pitch of the sample and therefore, do not need to follow the keyboard.

With a **Duration** of 1 and a **Duration Key Follow** setting of 100%, the difference in pitch between two keys is one semitone, which corresponds to the standard keyboard tuning. Longer durations lead to an audible volume modulation that is different for the different keys. To apply the same volume modulation with each key, set **Duration Key Follow** to 0%.

#### NOTE

The volume modulation is only audible if the grain is long and if you only use a few grains.

---

### Pitch Interval

Allows you to specify an interval between -12 and +12 semitones. The grains are played randomly at their original pitch, or are transposed according to the pitch interval. This parameter is suitable for longer grain durations.

### Pitch Random

Sets the random pitch range in semitones and cents. At a setting of +12, the random pitch values lie between -12 and +12 semitones. The random pitch is calculated separately for each channel of the sample, at the start of a new grain. This parameter can be used to enrich the sound.

### Level

Adjusts the overall level of the grain oscillator. When you increase the number of grains, it might become necessary to lower the oscillator level. When you play back a very quiet portion of a sample, you can use this control to raise the level.

### Random Level

Sets a random level for each new grain. At a setting of 100%, the level varies between a factor of 0 and 2 of the original level. The random level is calculated separately for each channel of the sample, at the start of a new grain. This can be used to randomize the panorama of the sound.

### Width

Narrows the stereo width of the grain oscillator. It is applied after the grain oscillator and does not affect the stereo width of the actual sample. At a setting of 0%, the output of the grain oscillator is mono.

### Auto Gain

Allows you to automatically adjust the level of grains using quieter sample parts. This way, you get a more homogeneous signal, and you can use a quiet part of a sample as the source.

### Grains

Allows you to specify the number of grains, from 1 to 8. For example, with a setting of 4, you obtain 4 grains per period of the grain duration.

To hear the effect of this setting, you have to play a new note.

## Mod Page

The **Mod** page contains the LFO settings in the upper section and the modulation wheel settings in the lower section.

### LFO Settings



#### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Freq

Controls the frequency of the modulation, that is, the speed of the LFO.

### Sync

If **Sync** is activated, the frequency is set in fractions of beats.

### Position

Controls the modulation depth of the grain position modulation.

### Formant

Controls the modulation depth of the grain formant modulation.

### Duration

Controls the modulation depth of the grain duration modulation.

### Cutoff

Controls the modulation depth of the filter cutoff modulation.

## Modulation Wheel Settings



### Vib Freq

Controls the frequency of the second LFO that is used for pitch modulation (vibrato).

### Vib Depth

Controls the depth of the pitch modulation (vibrato).

### Position

Controls the influence of the modulation wheel on the grain position.

### Formant

Controls the influence of the modulation wheel on the grain formant.

### Duration

Controls the influence of the modulation wheel on the grain duration.

### Cutoff

Controls the influence of the modulation wheel on the filter cutoff.

## Voice Page





### **Polyphony**

If **Mono** mode is deactivated, you can use this parameter to specify how many notes can be played simultaneously.

### **Octave**

Adjusts the pitch in octave steps.

### **Coarse**

Adjusts the pitch in semitone steps.

### **Fine**

Allows you to fine-tune the pitch in cent steps.

### **Fixed Pitch**

Activate this option if you do not want the sample to be transposed over the keyboard. If you work with short grain durations and **Duration Key Follow** is activated on the **Osc** page, the pitch of the played key still follows the keyboard, and only the frequency response changes.

### **Pitchbend Up/Pitchbend Down**

Determines the range of the modulation that is applied when you move the pitchbend wheel.

### **Glide**

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### **Glide Time**

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

### **Fingered**

Activate this parameter to glide the pitch only between notes that are played legato.

### **Mono**

Activates monophonic playback.

### **Retrigger**

If this option is activated, a note that was stolen is retriggered if you still hold the stolen note when releasing the newer note. This lets you play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### **Trigger Mode**

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.

If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.

- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

#### NOTE

If **Resume** or **Legato** is selected, you might hear an unnatural attack, depending on the sample. To avoid this, activate **Use Start Range** on the **Glide** tab in the **Voice Control** section for the zone.

---

## Filter Section

The filter section contains the settings for the filter, the filter envelope, the amplifier, and the amplifier envelope.

### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.

- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

#### **Cutoff**

Controls the cutoff frequency of the filter.

#### **Resonance**

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

#### **Distortion**

Adds distortion to the signal. The following distortion types are available:

- **Tube** adds warm, tube-like distortion.
- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Reduction** adds digital distortion by means of quantization noise.
- **Rate Reduction** adds digital distortion by means of aliasing.
- **Rate Reduction Key Follow** adds digital distortion by means of aliasing, but with **Key Follow**. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.

#### **Envelope Amount**

Controls the cutoff modulation from the filter envelope.

#### **Cutoff Velocity**

Controls the cutoff modulation from velocity.

#### **Cutoff Key Follow**

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

### **Filter Envelope Section**

#### **Attack**

Controls the attack time of the filter envelope.

#### **Decay**

Controls the decay time of the filter envelope.

#### **Sustain**

Controls the sustain level of the filter envelope.

#### **Release**

Controls the release time of the filter envelope.

### **Amplifier Section**

#### **Level**

Controls the overall volume of the sound.

#### **Velocity**

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

## Amplifier Envelope Section

### Attack

Controls the attack time of the amplifier envelope.

### Decay

Controls the decay time of the amplifier envelope.

### Sustain

Controls the sustain level of the amplifier envelope.

### Release

Controls the release time of the amplifier envelope.

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### KSOff (Key Switches Off)

Phrases that make use of key switches and noises, such as fret noises for guitar phrases, for example, usually only work with programs for the same type of instrument. Programs without key switches and noises interpret these events as regular notes and include them during playback, which yields unexpected results. To avoid the playback of key switches and noises, activate **KSOff**.

#### NOTE

**KSOff** filters out any note events that do not transpose with your playing. Therefore, it is not recommended for use with drum phrases.

#### NOTE

**KSOff** is not available for user phrases.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

#### NOTE

The phrase does not restart upon notes that are played legato.

---

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

#### NOTE

Not all phrases contain controller data.

---

### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **Vel Controller** is selected, you can choose a velocity controller to generate or modulate the velocities of the notes.
- If **Original + Vel Controller** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity derived from the velocity controller.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For

example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

## User Mode Parameters



### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

## Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

### NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

## Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

### NOTE

**Key Replace** can be set for each individual variation.

---

## Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

## Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

### NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.



The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up, Down, Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

### PROCEDURE

1. Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

2. Play some notes.

3. When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

4. Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.
- 

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop, Sync, Hold, Trigger Mode, Restart Mode, Key Mode, Vel Mode, Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

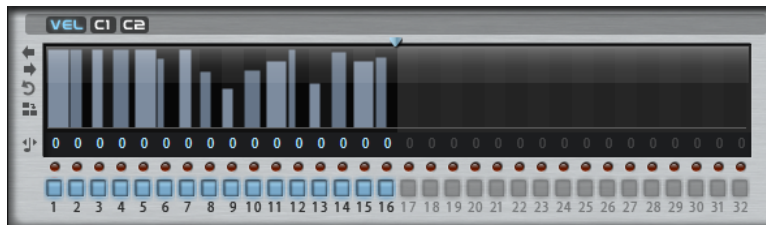
By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

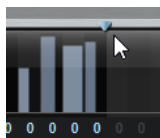
## Editing User Phrases

You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.



- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

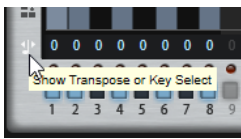
- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt-Shift**, and draw a line.

- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd - Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.  
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.
- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

#### NOTE

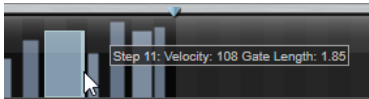
You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.

---



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step.  
You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

## Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**.  
If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

---

## Trium

Trium was designed to create modern and rich sounds. It comes with 3 oscillators, a sub oscillator, a ring modulator, and a noise generator. With the integrated arpeggiator and step sequencer, you can create anything from sequencer lines to stepped chords.



The oscillators are followed by a multi-mode filter that offers a large number of different filter shapes. The filter can be modulated using modulation sources like the keyboard, velocity, and LFO, but also by the controller lanes of the step sequencer, for example.

Trium includes two LFOs for pitch, PWM, and filter modulations. The first LFO can be synchronized to the tempo of the host application and allows for filter cutoff, pitch, and waveform modulation of the three main oscillators. The second LFO is controlled by the modulation wheel and is used to create a vibrato.

## Osc Page

The **Osc** page contains the parameters for the three main oscillators.

- To activate an oscillator, click its **On/Off** button.

### OSC 1/2/3 Type

The oscillator type defines the basic sound character of the oscillator. This pop-up menu lists the waveforms **Sine**, **Triangle**, **Saw**, and **Square**, followed by the algorithms **PWM**, **Sync**, **CM** and **XOR**. The combination of waveform and algorithm controls the sound of the oscillator.

The following algorithms are available:

- **PWM** (pulse width modulation) is only supported by the square waveform. The **Waveform** parameter sets the ratio between the high and the low value of the square wave. A setting of 50% produces a pure square wave. With settings below or above 50%, the oscillator produces rectangular waves.
- **Sync** provides different hard-sync oscillators, each of them a combination of a master and slave oscillator. The wave shape of the slave oscillator is reset with each full wave cycle of the master oscillator. This means that a single oscillator can produce a rich sync-sound without using other oscillators. The **Waveform** parameter adjusts the pitch of the slave oscillator, producing the typical sync sound.
- **CM** (cross modulation) provides a combination of two oscillators, where one oscillator is modulating the pitch of another oscillator at the rate of the audio

sample. The **Waveform** parameter adjusts the pitch ratio between the two oscillators, resulting in a sound closely resembling frequency modulation.

- **XOR** (exclusive OR) compares two square waveforms with an **XOR** operation. Depending on the outcome of the **XOR** operation, the wave shape of a third oscillator is reset. The **Waveform** parameter adjusts the pitch ratio of the square oscillators, resulting in a sound closely resembling ring modulation of the third oscillator.

#### Level

Adjusts the output level of the oscillator.

#### Waveform

Modifies the sound of the oscillator algorithm. Its effect depends on the selected oscillator type.

NOTE

This parameter is only available for oscillator types that allow waveform modulation.

---

#### Filter Envelope

Determines how much the modulation of the filter envelope influences the oscillator waveform.

NOTE

This parameter is only available for oscillator types that allow waveform modulation.

---

#### Tuning

These parameters allow you to adjust the pitch in octave, semitone, and cent steps.

#### Multi Oscillator Number, Detune, and Spread

- **Number** determines the number of oscillators that play back simultaneously. You can also set fractions of numbers. For example, with a setting of 2.5, you hear two oscillators at full level and a third one at half level.
- **Detune** detunes the oscillators.
- **Spread** narrows or widens the stereo panorama. With a setting of 0%, you create a mono signal, and with 100%, you create a stereo signal.

## Sub Page

The **Sub** page contains the parameters for the sub oscillator, the ring modulator, and the noise generator.



Activate the sub oscillator, the ring modulator, and the noise generator by clicking their **On/Off** buttons.

#### NOTE

Deactivate the sub oscillator, the ring modulator, and the noise generator if they are not needed, because they use CPU cycles even if they are not heard, such as in a situation where the level is set to 0 %.

---

### Sub Oscillator

The pitch of the sub oscillator is always one octave lower than the overall pitch. The overall pitch is determined by the **Octave** setting.

#### On/Off

Activates/Deactivates the sub oscillator.

#### Type

Determines the wave shape of the sub oscillator. You can choose **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, or **Pulse Narrow**.

#### Level

Adjusts the output level of the sub oscillator.

### Ring Modulator

Ring modulation generates sums and differences between the frequencies of two signals.

#### Ring Modulation Source 1/Ring Modulation Source 2

Determines the sources to be ring modulated. You can select **OSC 1** or **Sub** as **Source 1**, and **OSC 2** or **OSC 3** as **Source 2**.

#### NOTE

Make sure that the corresponding oscillators are activated when you select them. Otherwise, no sound is heard.

---

#### Ring Modulation Level

Adjusts the output level of the ring modulation.

### Noise Generator

The **Noise** parameter is used for non-pitched sounds. In addition to standard white and pink noise, there are also band-pass filtered versions of white and pink noise.

#### Noise Type

The sound color of the noise. You can choose between standard and band-pass filtered (**BPF**) versions of white and pink noise.

#### Noise Level

Adjusts the output level of the noise generator.

### Voice Parameters

On the right, the voice parameters are available.

#### Polyphony

If **Mono** mode is deactivated, you can use this parameter to specify how many notes can be played simultaneously.

### Octave

Adjusts the pitch in octave steps.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

### Glide

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Glide Time

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

### Fingered

Activate this parameter to glide the pitch only between notes that are played legato.

### Mono

Activates monophonic playback.

### Retrigger

If this option is activated, a note that was stolen is retriggered if you still hold the stolen note when releasing the newer note. This lets you play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

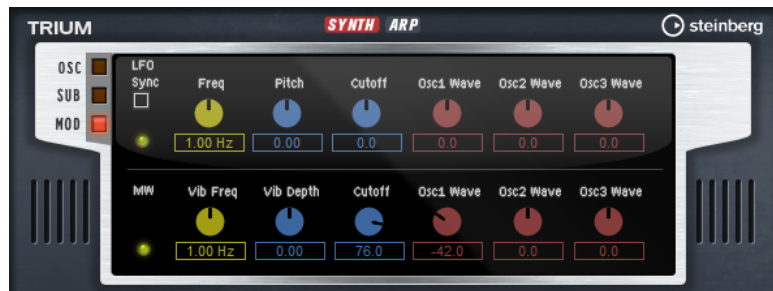
#### NOTE

If **Resume** or **Legato** is selected, you might hear an unnatural attack, depending on the sample. To avoid this, activate **Use Start Range** on the **Glide** tab in the **Voice Control** section for the zone.

---

## Mod Page

The **Mod** page contains the LFO settings in the upper section and the modulation wheel settings in the lower section.



### LFO Settings

#### Sync

If **Sync** is activated, the frequency is set in fractions of beats.

#### Freq

Controls the frequency of the modulation, that is, the speed of the LFO.

#### Pitch

Controls the modulation depth of the pitch modulation.

#### Cutoff

Controls the modulation depth of the filter cutoff modulation.

#### Osc1/2/3 Wave

These parameters control the modulation depth of the waveform modulation of the three main oscillators.

#### NOTE

These controls are only available if the selected oscillator type supports waveform modulation.

---

### Modulation Wheel Settings

#### Vib Freq

Controls the frequency of the second LFO that is used for pitch modulation (vibrato).

#### Vib Depth

Controls the depth of the pitch modulation (vibrato).

#### Cutoff

Controls the influence of the modulation wheel on the filter cutoff.

#### Osc1/2/3 Wave

These parameters control the influence of the modulation wheel on the waveform of the three main oscillators.

#### NOTE

These controls are only available if the selected oscillator type supports waveform modulation.

---



## Filter Section



### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.
- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Sets the filter resonance.

### Distortion

Adds distortion to the signal. The following distortion types are available:

- **Tube** adds warm, tube-like distortion.

- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Reduction** adds digital distortion by means of quantization noise.
- **Rate Reduction** adds digital distortion by means of aliasing.
- **Rate Reduction Key Follow** adds digital distortion by means of aliasing, but with **Key Follow**. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.

#### **Envelope Amount**

Controls the cutoff modulation from the filter envelope.

#### **Cutoff Velocity**

Controls the cutoff modulation from velocity.

#### **Cutoff Key Follow**

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

## **Filter Envelope Section**



#### **Attack**

Controls the attack time of the filter envelope.

#### **Decay**

Controls the decay time of the filter envelope.

#### **Sustain**

Controls the sustain level of the filter envelope.

#### **Release**

Controls the release time of the filter envelope.

## **Amplifier Section**

#### **Level**

Controls the overall volume of the sound.

#### **Velocity**

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

## **Amplifier Envelope Section**

#### **Attack**

Controls the attack time of the amplifier envelope.

#### **Decay**

Controls the decay time of the amplifier envelope.

### Sustain

Controls the sustain level of the amplifier envelope.

### Release

Controls the release time of the amplifier envelope.

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### KSOff (Key Switches Off)

Phrases that make use of key switches and noises, such as fret noises for guitar phrases, for example, usually only work with programs for the same type of instrument. Programs without key switches and noises interpret these events as regular notes and include them during playback, which yields unexpected results. To avoid the playback of key switches and noises, activate **KSOff**.

NOTE

**KSOff** filters out any note events that do not transpose with your playing. Therefore, it is not recommended for use with drum phrases.

NOTE

**KSOff** is not available for user phrases.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

#### NOTE

The phrase does not restart upon notes that are played legato.

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

#### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

#### NOTE

Not all phrases contain controller data.

#### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **Vel Controller** is selected, you can choose a velocity controller to generate or modulate the velocities of the notes.
- If **Original + Vel Controller** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity derived from the velocity controller.

#### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

#### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

#### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

#### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

#### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

## Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

## User Mode Parameters



## Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

## Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

## Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

#### NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

#### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

#### NOTE

**Key Replace** can be set for each individual variation.

---

#### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

#### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

#### NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up**, **Down**, **Up/Down 1**, etc.

- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

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### PROCEDURE

**1.** Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

**2.** Play some notes.

**3.** When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

**4.** Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.

---

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

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### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

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## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

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### PROCEDURE

- 1.** Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.



2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

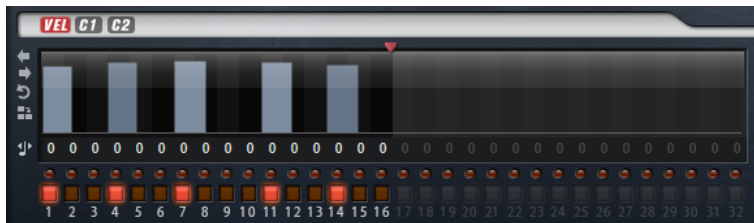
By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

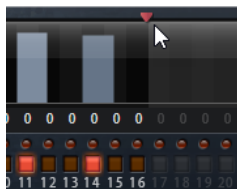
## Editing User Phrases

You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.



- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt - Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd - Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.

If **Legato** is activated, the **Gate Scale** parameter is not taken into account.

- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

#### NOTE

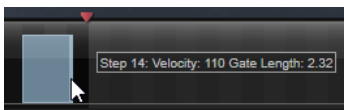
You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.

---



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step. You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

## Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**. If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

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# Voltage

Voltage is a two-oscillator and noise synthesizer that can be used for synth basses, but it also allows you to create any kind of classic monophonic and polyphonic synth sound. With the

integrated arpeggiator and step sequencer, you can create anything from sequencer lines to stepped chords.



The two oscillators and the noise generator are followed by a 24 dB low-pass filter. The filter can be modulated using modulation sources like the keyboard, velocity, and LFO, but also by the controller lanes of the step sequencer, for example. Voltage includes 2 LFOs for pitch, PWM, and filter modulations. The first LFO can be synchronized to the tempo of the host application and allows for filter and pitch modulation. The second LFO is controlled by the modulation wheel and is used to create a vibrato.

## Oscillator Section



### Oscillator 1/2 Waveform

Sets the waveform for the oscillator. You can choose between saw, triangle, and square.

### Oscillator 1/2 Level

Controls the level of the oscillators.

### PWM

PWM (pulse width modulation) is only available for the square waveform. Activate this option if you want to be able to let the LFO modulate the width of the wave.

### Osc 2 Coarse

Detunes the second oscillator by +/-12 semitones.

### Osc 2 Fine

Detunes the second oscillator by +/- 100 cents.

### Noise Type

The sound color of the noise. You can choose between standard and band-pass filtered (**BPF**) versions of white and pink noise.

### Level

Controls the level of the noise generator.

## Filter Section



### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### Distortion

Adds tube-like distortion to the signal.

### Envelope Amount

Controls the cutoff modulation from the filter envelope.

### Cutoff Velocity

Controls the cutoff modulation from velocity.

### Cutoff Key Follow

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

## Amplifier Section



### Level

Controls the overall volume of the sound.

### Velocity

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

## Voice Section



### Octave

Adjusts the pitch in octave steps.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

### Glide

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Fingered

Activate this parameter to glide the pitch only between notes that are played legato.

### Mono

Activates monophonic playback.

### Retrigger

This option is only available in **Mono** mode. If **Retrigger** is activated, a note that was stolen by another note is retriggered if you still hold the stolen note when you release the new one.

This way, you can play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running, and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

#### NOTE

If **Resume** or **Legato** is selected, you might hear an unnatural attack, depending on the sample. To avoid this, activate **Use Start Range** on the **Glide** tab in the **Voice Control** section for the zone.

---

## LFO Section



### Freq

Controls the frequency of the modulation, that is, the speed of the LFO.

### Sync

If **Sync** is activated, the frequency is set in fractions of beats.

### Cutoff

Controls the modulation depth of the filter cutoff modulation.

### Pitch

Controls the modulation depth of the pitch modulation.

### PWM

Controls the modulation depth of the pulse width modulation of the square oscillators.

## Modulation Wheel Section



### Vib Freq

Controls the frequency of the second LFO that is used for pitch modulation (vibrato).

### Cutoff

Controls the influence of the modulation wheel on the filter cutoff.

### Vib Depth

Controls the depth of the pitch modulation (vibrato).

### Distortion

Controls the influence of the modulation wheel on the filter distortion.

## Filter Envelope Section



### Attack

Controls the attack time of the filter envelope.

### Decay

Controls the decay time of the filter envelope.

### Sustain

Controls the sustain level of the filter envelope.

### Release

Controls the release time of the filter envelope.

## Amp Envelope Section



### Attack

Controls the attack time of the amplifier envelope.

### Decay

Controls the decay time of the amplifier envelope.

### Sustain

Controls the sustain level of the amplifier envelope.

### Release

Controls the release time of the amplifier envelope.

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### KSOff (Key Switches Off)

Phrases that make use of key switches and noises, such as fret noises for guitar phrases, for example, usually only work with programs for the same type of instrument. Programs without key switches and noises interpret these events as regular notes and include them during playback, which yields unexpected results. To avoid the playback of key switches and noises, activate **KSOff**.

#### NOTE

**KSOff** filters out any note events that do not transpose with your playing. Therefore, it is not recommended for use with drum phrases.

#### NOTE

**KSOff** is not available for user phrases.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.



- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

NOTE

The phrase does not restart upon notes that are played legato.

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

NOTE

Not all phrases contain controller data.

### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **Vel Controller** is selected, you can choose a velocity controller to generate or modulate the velocities of the notes.
- If **Original + Vel Controller** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity derived from the velocity controller.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

## User Mode Parameters



### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

#### NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

#### NOTE

**Key Replace** can be set for each individual variation.

---

### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

#### NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up, Down, Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

#### PROCEDURE

1. Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

2. Play some notes.
3. When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

4. Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.
-

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
  - To start from scratch, load a phrase, and edit the settings.
  - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.

---

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

---

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

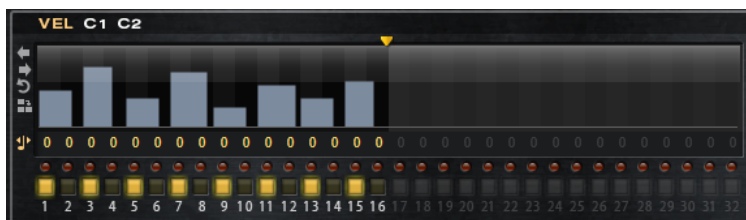
By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

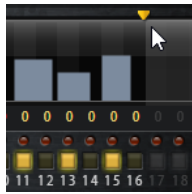
## Editing User Phrases

You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.



- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



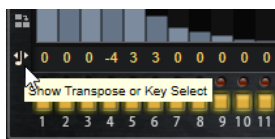
## Editing Steps

The height of a step represents its value. You can edit the steps in the following ways:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt - Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd - Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.  
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.
- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

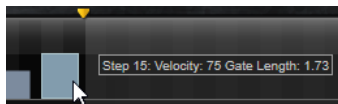
### NOTE

You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step.  
You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.

- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

### Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**.  
If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

---

## Model C

Model C is a classic tonewheel organ emulation with 9 drawbars and 3 additional drawbars for the percussion.

Model C comes with an integrated and highly configurable rotary effect, as well as an amplifier emulation using VST Amp technology. The effect section provides additional effects, such as phaser, delay, and reverb, and also offers a ring modulator which allows to add non-harmonic tones. Model C contains four pages: **Organ**, **Rotary**, **Amp**, and **FX**.

- To open a page, click the corresponding button in the top section of the window.

## Organ Page



### Drawbars

The main drawbars on the left adjust the levels of the individual tonewheels. The three drawbars on the right adjust the levels of the tonewheels that are used for percussion.

### Rotary

Allows you to switch from fast to slow speaker rotation. In the middle position, rotation is stopped. On the **Rotary** page, you can make detailed settings for the effect.

### Attack

Adjusts the attack time of the organ sound. Typically, the attack is very short, but you can set longer times to create pad-like sounds.

### Release

Adjusts the release time of the organ sound. Typically, the release time is very short, but you can set longer times to achieve a slow fade out of the sound when a key is released.

### Velocity

Determines the influence of the velocity on the level of the organ sound.

### Key On Click/Key Off Click

Electromechanical organs produce short noise signals when a note is triggered and when it is released. The level of these clicks is set here.

### Vibrato



Click the pedal button to activate the integrated vibrato effect. If it is activated, you can select a type using the control on the right.

### Rotary/Amp

The organ signal is sent in parallel to the rotary speaker and to the internal amp. This control allows you to specify how the signal is distributed between these two destinations.

- If you turn the control all the way to the left, the signal is sent only to the rotary speaker. All the way to the right, it is sent only to the amp.

### Percussion



Click the pedal button to activate the percussion signal. The following percussion parameters are available:

- **Steal 1'** – Typically, on an electromechanical organ, the 1' drawbar is not available when percussion is activated. To prevent this, deactivate **Steal 1'**.
- **Poly** – Typically, percussion in drawbar organs is monophonic, that is, when you play a key, the percussion envelope is triggered for this note. As long as the key is held, no new percussion can be retriggered. If you play a legato section, for example, percussion is only applied to the very first note or chord. Percussion can only be retriggered after all notes are released.



To trigger the percussion with every new note, activate **Poly**.

- **Level** adjusts the loudness of the percussion signal.

## Rotary Page

The settings on this page only have an effect on the sound when signals are sent to the rotary effect using the **Rotary/Amp** control on the **Organ** page.



### Rotation Speed

Changes the rotation speed of the horn and drum. When set to **Fast**, the Doppler effect is stronger. When set to **Stop**, there is no Doppler effect because the drum and horn do not rotate. Because the horn and drum accelerate and decelerate at different speeds, the transition from **Slow** to **Fast** and vice versa generates highly interesting sounds.

### Distance

Sets the distance between the microphones and the horn and drum. The amplitude modulation of the sound decreases with the distance of the microphones. Set this to higher values for less amplitude modulation.

### Cabinet

The horn and drum sound different when recorded through the louvers of the cabinet. Use this parameter to color the horn and drum with the sound of the cabinet. With a setting of 100%, you obtain the full sound of the cabinet.

### Balance

Adjusts the balance between the horn and drum microphones. With a setting of 0%, you hear only the drum. With a setting of 100%, you hear only the horn.

### Slow

Adjusts the slow speed of the horn and drum at the same time.

### Fast

Adjusts the fast speed of the horn and drum at the same time.

### Accel

Adjusts the acceleration time for raising and lowering the rotation speed of the horn and drum.

### Horn Mic Angle

Adjusts the stereo spread of the horn microphones. With a setting of 0°, the sound image is mono. With a setting of 180°, the sound image is fully stereo.

### Drum Mic Angle

Adjusts the stereo spread of the drum microphones. With a setting of 0°, the sound image is mono. With a setting of 180°, the sound image is fully stereo.

### Treble

Adjusts the tone color of the high frequencies.

### Drive

Adjusts the distortion of the amplifier.

### Bass

Adjusts the tone color of the low frequencies.

### Gain

Adjusts the gain after the rotary and drive.

## Amp Page

The settings on this page only have an effect on the sound if signals are sent to the amp using the **Rotary/Amp** control on the **Organ** page.



### Amp On/Off

Activates/Deactivates the amplifier effect.

### Drive

Adjusts the amount of overdrive.

### Bass

Adjusts the tone color of the low frequencies.

### Middle

Adjusts the tone color of the mid frequencies.

### Treble

Adjusts the tone color of the high frequencies.

### Presence

Adjusts the brightness of the sound.

### Master

Controls the output level of the amplifier.

### Microphone Type

Allows you to select whether you want to use a dynamic microphone, a tube microphone, or a combination of both.

### Microphone Position

Allows you to choose between an off-axis and an on-axis microphone position.

## FX Page



### Ring Modulator



#### On/Off

Activates/Deactivates the ring modulator effect.

#### LFO Freq

Sets the frequency of the LFO for modulating the frequency of the sine oscillator.

#### LFO Depth

Sets the intensity of the LFO modulation of the sine oscillator frequency.

#### Sine Freq

Sets the frequency of the sine oscillator.

#### Mix

Sets the ratio between the dry and the wet signal.

## Phaser



### On/Off

Activates/Deactivates the Phaser effect.

### Rate

Sets the frequency of the phase modulation in Hertz.

### Depth

Sets the intensity of the phase modulation.

### Feedback

Adds resonances to the effect. Higher settings produce a more pronounced effect.

### Mix

Sets the ratio between the dry and the wet signal.

## Delay



### On/Off

Activates/Deactivates the delay effect.

### Delay Mode

- **Stereo** has two delays in parallel, one for the left and one for the right audio channel, each with a feedback path of its own.
- **Cross** has two delay lines with cross feedback, where the delay of the left channel is fed back into the delay of the right channel, and vice versa.
- **Ping-Pong** mixes the left and right input channels and sends the mixed signal to hard-panned left and right delays. This way, the echoes bounce from left to right, like a ping-pong ball, in the stereo panorama.

### Time

Sets the overall time for the left and right delay in milliseconds.

### Feedback

Sets the overall amount of feedback for the left and right delay. Feedback means the output of the delay is fed back to its input. Set to 0%, you hear only one echo. With a setting of 100%, the echoes are continuously repeated.

### Mix

Sets the ratio between the dry and the wet signal.

## Reverb



### On/Off

Activates/Deactivates the Reverb effect.

### Reverb Type

Use this control to switch between the available reverb types: **Spring**, **Plate**, and **Hall**.

### Time

Allows you to set the reverb time in seconds.

### Predelay

Controls how much time passes before the reverb is applied. This allows you to simulate larger spaces by increasing the time it takes for first reflections to reach the listener.

### Mix

Sets the ratio between the dry and the wet signal.

## HALiotron

HALiotron emulates the sound generation of the pre-digital sampling era.

Before the introduction of digital samplers, original instrument sounds were created by playing a pre-recorded tape for every key. HALiotron comes with seven different tapes from these days, which can be blended to create sound mixtures. In addition to its classic archetype, HALiotron offers a set of the most important synthesis parameters, allowing you to vary the shape of the sound. Furthermore, you can play sounds dynamically by controlling filter and amp via velocity.

## Main Page



### Loop On/Off

Set this to **On** if you want the notes to be played using looped versions of the underlying samples and to **Off** if you want the notes to stop when the tape reaches its end.

### Volume

Adjusts the main volume of the sound.

### Speed

Adjusts the speed of the tape playback. If this is set to **Slow**, the samples are played back an octave lower.

### Cutoff

Adjusts the cutoff frequency of the built-in low-pass filter.

### Pitch

Adjusts the tuning of the sound. When you combine several HALiotron presets, this can be used to make the sound richer.

### A, B, C

Click here to select one of the included tapes for each knob position. Use the control to blend seamlessly between the tapes.

### Attack

Adjusts the attack time of the sound.

### Release

Adjusts the release time of the sound.

### Velocity

Controls the influence of the velocity on the level of the sound.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

### Coarse Tune

Adjusts the sound in semitone steps. This allows you to play intervals with multiple layered HALiotron sounds.

## Filter Page





### Resonance

Adjusts the resonance of the low-pass filter.

### Velocity

Sets the influence of the velocity on the level of the sound.

### Env Amount

Adjusts the influence of the filter envelope on the cutoff frequency.

### KYB

Adjusts the cutoff modulation from the keyboard, that is, cutoff key follow.

### Attack

Controls the attack time of the filter envelope.

### Decay

Controls the decay time of the filter envelope.

### Sustain

Controls the sustain level of the filter envelope.

## B-Box

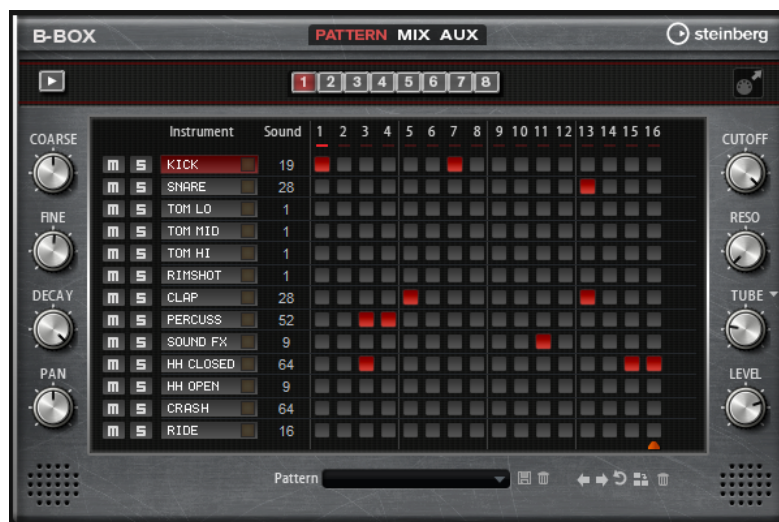
B-Box provides you with a veritable drum computer. It comes with 13 instrument lanes that can make use of up to 128 different sounds. You can set up your drum patterns, create variations, and modify each drum sound using a low-pass filter and several distortion modes.

B-Box contains three pages: **Pattern**, **Mix**, and **Aux**.

- To open a page, click the corresponding button in the top section of the window.

## Pattern Page

The **Pattern** page is where you create and edit the drum patterns. It gives you access to the pattern editor as well as to some of the most important sound parameters.



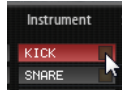
The pattern editor section in the center of the window allows you to create and edit drum patterns.

- To specify the number of steps for a pattern, drag the small triangle in the lower part of the pattern display.

The maximum length is 16 steps.



- To change the drum sound for a lane, set a new value in the **Sound** column. You can choose between up to 128 drum sounds, depending on the selected drum instrument.
- To preview a drum sound, click the trigger button to the right of the instrument name.







- To add drum steps to the pattern, click on the step fields in the pattern editor. To add drum steps for all fields on a lane in one go, hold down **Shift** and click on a field.
- To mute or solo individual lanes, click the corresponding **Mute** and **Solo** buttons.
- To set up the velocity for a step, click it and drag up or down or use the mouse wheel. A step can be set to low, medium, or high velocity. To change the velocity of all steps in a lane at the same time, hold down **Shift** and use the mouse.

#### NOTE

This function inserts drum steps for every step field on the lane and sets it to the same velocity. If you want to use only several steps of this lane, you must modify the velocity separately for each step.


- To remove a step, click it. To remove all steps, hold down **Shift - Ctrl/Cmd** and click a step.

## Editing the Entire Pattern

- To load a pattern, click in the field below the editor and select it from the pop-up menu.
- To move all steps of the pattern one step to the left or right, click **Shift Pattern Left**  or **Shift Pattern Right** .
- This is useful if you have created a pattern that sounds the way you want but does not start on the first beat, for example.
- To mirror the pattern around its middle step, click **Reverse Pattern** .
- To copy all steps in the current pattern and insert them behind the current steps, click **Duplicate Pattern** .

#### NOTE

The maximum number of steps in a pattern is 16. If you select **Duplicate Pattern** and the resulting pattern would be longer than 16 steps, new steps are inserted until the maximum length is reached.

- To remove all steps in a pattern, click **Clear Pattern** .



## Setting Up the Drum Sounds

With the controls to the left and right of the pattern editor, you can make settings for the selected drum instrument.

### Coarse

Adjusts the tuning of the instrument in semitone steps.

### Fine

Fine-tunes the instrument in cent steps.

### Pan

Adjusts the panorama position.

### Cutoff

Adjusts the cutoff frequency for the instrument.

### Resonance

Adjusts the filter resonance for the instrument.

### Distortion Type

Sets the distortion type. You can choose between **Tube**, **Hard Clip**, **Bit Reduction**, and **Rate Reduction**.

### Distortion

Sets the amount of distortion for the instrument.

### Level

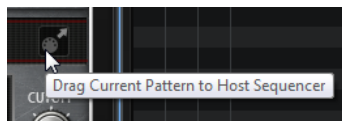
Sets the level of the instrument.

## Playing Back the Pattern

- To play back the pattern, use the **Play/Stop** button at the top of the window. An indicator below the step number shows which step is playing.

## Exporting Patterns

- To export a pattern as a MIDI file, drag the MIDI export field into your host application.



## Variations

B-Box offers up to 8 variations that can be used to create different rhythm patterns, such as intros, fills, and endings, for example.

- To switch between variations, click the variation buttons above the pattern editor.
- You can copy and paste variations using the commands on the context menu.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, and **Input Mode** are not part of the variations.

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RELATED LINKS

[Assigning Variations to Trigger Pads](#) on page 396

## Assigning Variations to Trigger Pads

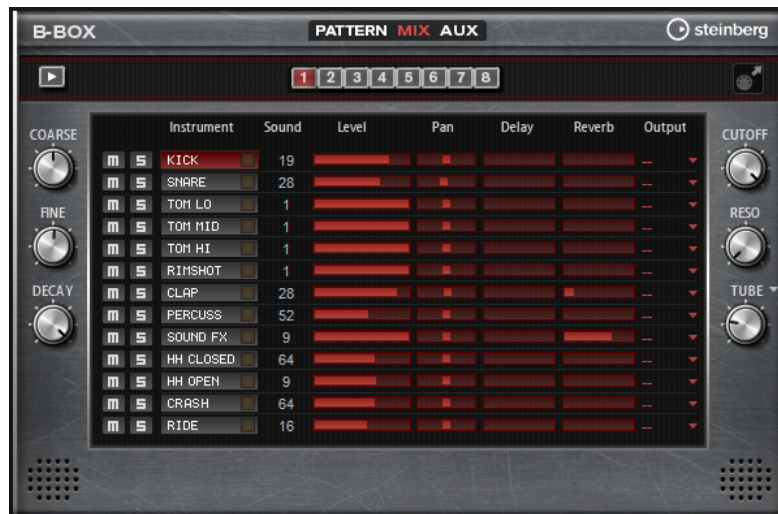
If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
2. Repeat this procedure for all the variations that you have created.

## Mix Page

On the **Mix** page, you can add effects to the patterns.



### Level

Adjusts the level of the instrument.

### Pan

Adjusts the panorama position of the instrument.

### Delay

Determines how much of the signal is sent to the delay effect.

### Reverb

Determines how much of the signal is sent to the reverb effect.

### Output

Here, you can select one of the available plug-in outputs.

## AUX Page

On the **Aux** page, you can make global settings for B-Box and the included effects.

The page is divided into two sections. The left section gives you access to the global performance settings, and the right section allows you to edit the integrated delay and reverb effects.



## Performance Section

### Loop

If this option is activated, the pattern plays back in a loop.

### Hold

Allows you to prevent the pattern from stopping or changing when the keys are released.

- If **Off** is selected, the pattern changes as soon as you release a key. The pattern stops immediately when you release all keys.
- If **On** is selected, the pattern plays to the end, even if the keys are released. If **Loop** is activated, the pattern is repeated continuously.
- If **Gated** is selected, the pattern starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the pattern.

### Trigger Mode

The trigger mode determines at which moment B-Box changes the pattern when you select another variation.

- If the parameter is set to **Immediately**, the pattern changes as soon as you switch to another variation.
- If the parameter is set to **Next Beat**, the pattern changes on the first new beat after switching to another variation.
- If the parameter is set to **Next Measure**, the pattern changes at the first new measure after switching to another variation.

### Restart Mode

Determines whether the pattern playback is restarted when a note is triggered.

- **Off** – Playback is not restarted if it is already running.
- **First Note** – Restarts playback when a note is triggered and no other notes are playing.
- **Each Note** – Restarts playback every time a note is triggered.
- **Sync to Host** – Aligns playback with the beats and measures of your host application. Playback is synchronized every time you start the transport.

- **Follow Transport** – Playback starts and stops automatically together with the transport controls in your host application.

### Input Mode

Keys that trigger the pattern are shown in green on the internal keyboard. Keys that are assigned to an instrument sound are shown as regular black and white keys.

Depending on the **Input Mode**, the black and white keys either trigger or mute the assigned instrument.

- **Off** triggers the pattern with any key that you play.
- **Trigger** plays back the sound of the assigned instrument.
- **Mute** mutes the track for as long as you press the key.

### Sync

To synchronize the pattern to the tempo of your host application, activate **Sync**.

For the modes **Sync to Host** and **Follow Transport**, synchronization to the host application is established automatically. In these modes, the **Sync** parameter cannot be edited.

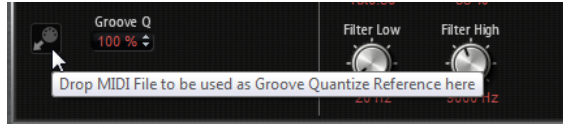
### Tempo

If **Sync** is deactivated, you can use the **Tempo** parameter to set the internal playback speed.

### Tempo Scale

Defines the speed at which the pattern is running. You can specify a value in fractions of beats. You can also set dotted and triplet note values. For example, if the **Tempo** parameter is set to **1/16** and you set this value to **1/8**, the speed is cut in half.

### Groove Quantizing Patterns



To adapt the timing of a pattern to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field. You can quantize the playback of the pattern to the timing of a sliced loop by dragging its MIDI file from the MIDI export drag field to the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the pattern follows the timing of the MIDI file.

### Swing

Shifts the timing of notes on even-numbered beats. This way, the pattern gets a swing feeling. Negative values let the notes play earlier, positive values let the notes play later.

### Velocity Scale

Allows you to raise or lower the note-on velocities of the pattern. At a value of 100 %, the notes play with their original velocity.

### Effects Section

To activate the effects, click the corresponding **On/Off** button at the top of the page.



To select an effect and show the corresponding parameters in the section, click the name of the effect so that it turns red.

## Delay Parameters



### Delay Mode

- **Stereo** has two delays in parallel, one for the left and one for the right audio channel, each with a feedback path of its own.
- **Cross** has two delay lines with cross feedback, where the delay of the left channel is fed back into the delay of the right channel, and vice versa.
- **Ping-Pong** mixes the left and right input channels and sends the mixed signal to hard-panned left and right delays. This way, the echoes bounce from left to right, like a ping-pong ball, in the stereo panorama.

### Time

Sets the overall time for the left and right delay in milliseconds.

### Sync

Allows you to synchronize the delay time to the host tempo. If **Sync** is activated, the time is set as a note value.

#### NOTE

The maximum delay time is 5000 ms. If the note length exceeds this value, it is automatically shortened.

### Delay L/R

Offsets the time of the left or right delay from the overall delay time. At a factor of 1, the right or left delay time has the same length as the overall delay time. At a factor of 0.5, the time is half as long as the overall delay time.

- To offset the left delay time, turn the control to the left.
- To offset the right delay time, turn the control to the right.

### Feedback

Sets the overall amount of feedback for the left and right delay. Feedback means the output of the delay is fed back to its input. Set to 0%, you hear only one echo. With a setting of 100%, the echoes are continuously repeated.

### Feedback L/R

Offsets the amount of feedback of the left or right delay from the overall feedback. A factor of 1 means that the amount of feedback corresponds to the overall feedback. A factor of 0.5 means that the amount is half the overall feedback.

- To offset the left feedback, turn the control to the left.

- To offset the right feedback, turn the control to the right.

#### NOTE

This parameter is only available in **Stereo** mode.

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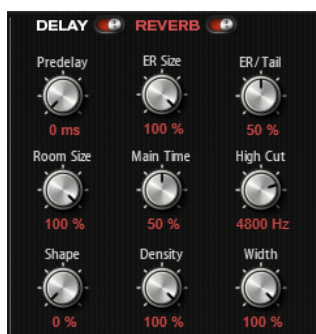
### Filter Low

Attenuates the low frequencies of the delays.

### Filter High

Attenuates the high frequencies of the delays.

## Reverb Parameters



### Predelay

Determines how much time passes before the reverb is applied. This allows you to simulate larger rooms by increasing the time it takes for the first reflections to reach the audience.

### ER Size

Adjusts the length of the early reflections pattern. With a setting of 100%, the pattern is applied with its original length and the room sounds natural to the highest possible degree. With settings below 100%, the early reflections pattern is compressed, and the room is perceived as smaller.

### ER/Tail

Sets the level balance between the early reflections and the reverb tail. With a setting of 50%, early reflections and tail have the same volume. Settings below 50% raise the early reflections and lower the tail. As a result, the sound source moves towards the front of the room. Settings above 50% raise the tail and lower the early reflections. As a result, the sound source moves toward the back of the room.

### Room Size

Controls the dimensions of the simulated room. With a setting of 100%, the dimensions correspond to a cathedral or a large concert hall. With a setting of 50%, the dimensions correspond to a medium-sized room or studio. Settings below 50% simulate the dimensions of a small room or a booth.

### Main Time

Controls the overall reverb time of the tail. The higher this value, the longer the reverb tail will decay. With a setting of 100%, the reverb time is infinitely long. The **Main Time** parameter also represents the mid band of the reverb tail.

### High Cut

Attenuates the high frequencies of the early reflections. The lower this value, the fewer high frequencies are present in the early reflections.

### Shape

Controls the attack of the reverb tail. With a setting of 0%, the attack is more immediate, which is a suitable setting for drums. The higher this value, the less immediate the attack.

### Density

Adjusts the echo density of the reverb tail. With a setting of 100%, single reflections from walls cannot be heard. The lower this value, the more audible the single reflections.

### Width

Adjusts the output of the reverb signal between mono and stereo. With a setting of 0%, the output of the reverb is mono. At 100%, it is stereo.

## Level Controls



### Delay Level

Adjusts the general amount of delay.

### Reverb Level

Adjusts the general amount of reverb.

### Master Volume

Adjusts the overall volume of B-Box.

## World Instruments

World Instruments delivers a great variety of ethnic instruments that can either be played manually or use the integrated arpeggiator.

On the **Sound** page, the instruments can be fine-tuned with filter and amp settings. In addition, you can use the built-in micro-tuning functionality to decrease the pitch of each key by a quarter note, to realize typical oriental scales.



## Sound Page



### Filter Section

#### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.



- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

**Cutoff**

Controls the cutoff frequency of the filter.

**Resonance**

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

**Envelope Amount**

Controls the cutoff modulation from the filter envelope.

**Cutoff Velocity**

Controls the cutoff modulation from velocity.

**Filter Envelope****Attack**

Controls the attack time of the filter envelope.

**Decay**

Controls the decay time of the filter envelope.

**Sustain**

Controls the sustain level of the filter envelope.

**Release**

Controls the release time of the filter envelope.

**Amp Section****Key Delay**

Delays playback of the notes. This parameter can be used when working with multiple programs or layers. Setting up different key delay values for the different layers allows you to spread the notes, so that they do not all begin at the same time.

**Level**

Controls the overall volume of the sound.

**Velocity**

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

**Amp Envelope****Attack**

Controls the attack time of the amplifier envelope.

**Decay**

Controls the decay time of the amplifier envelope.

**Sustain**

Controls the sustain level of the amplifier envelope.

**Release**

Controls the release time of the amplifier envelope.

## Pitch Section

### Coarse

Adjusts the tuning in semitones.

### Fine

Adjusts the tuning in cents.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

## LFO Section

### Freq

Controls the frequency of the modulation, that is, the speed of the LFO.

### Sync

If **Sync** is activated, the frequency is set in fractions of beats.

### Pitch

Controls the modulation depth of the pitch modulation.

### Cutoff

Controls the modulation depth of the filter cutoff modulation.

## MW Section

### Vib Freq

Controls the frequency of the second LFO that is used for pitch modulation (vibrato).

### Vib Depth

Controls the depth of the pitch modulation (vibrato).

### Cutoff

Controls the influence of the modulation wheel on the filter cutoff.

## Oriental Scale Section

### Scale On/Off

Activates/Deactivates the influence of the scale settings on the played notes.

### Note Switches

Activate a switch to decrease the tuning of the corresponding note by a quarter note.

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### Variations

The variation buttons allow you to switch between the available variations.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Phrase

Allows you to select a phrase.

### KSOFF (Key Switches Off)

Phrases that make use of key switches and noises, such as fret noises for guitar phrases, for example, usually only work with programs for the same type of instrument. Programs without key switches and noises interpret these events as regular notes and include them during playback, which yields unexpected results. To avoid the playback of key switches and noises, activate **KSOFF**.

NOTE

**KSOFF** filters out any note events that do not transpose with your playing. Therefore, it is not recommended for use with drum phrases.

NOTE

**KSOFF** is not available for user phrases.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

NOTE

The phrase does not restart upon notes that are played legato.

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

NOTE

Not all phrases contain controller data.

### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **Vel Controller** is selected, you can choose a velocity controller to generate or modulate the velocities of the notes.
- If **Original + Vel Controller** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity derived from the velocity controller.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

### User Mode Parameters

#### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

#### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

#### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

#### NOTE

Deactivated steps are taken into account.

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

#### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.

- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

#### NOTE

**Key Replace** can be set for each individual variation.

---

### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

#### NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up, Down, Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

#### PROCEDURE

1. Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

2. Play some notes.

3. When you are done, click **Record MIDI Output** again.  
Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.
  4. Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.
- 

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

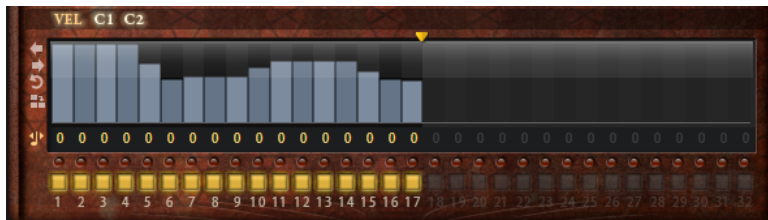
To create your own phrases, activate the **User** button.

## Editing User Phrases

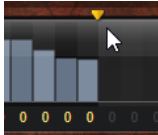
You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.





- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



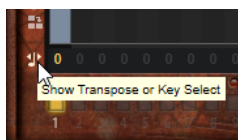
## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt - Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd - Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.  
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.
- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

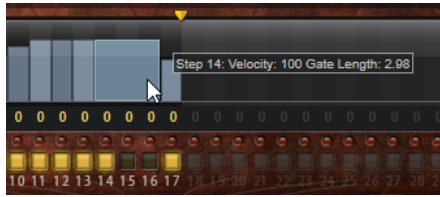
### NOTE

You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step. You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

### Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**.  
If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

---

## World Percussion

World Percussion delivers a great variety of ethnic percussion instruments and associated MIDI phrases.

The instruments can be globally fine-tuned with filter and amp settings which in turn can make use of envelope settings. The built-in MIDI player allows you to use the included MIDI phrases or to import your own MIDI phrases.



## MIDI Player Parameters

In the top section of the macro page, the MIDI player parameters are available.

### On/Off button

Activates/Deactivates the MIDI player part of World Percussion.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag your MIDI phrase to your host sequencer.

### Loop

Allows you to play the phrase in a loop.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Trigger Mode

Determines at which moment the player changes the phrase when you select another variation.

- **Immediately** – The phrase changes as soon as you switch to another variation.
- **Next Beat** – The phrase changes on the first new beat after switching to another variation.

- **Next Measure** – The phrase changes on the first new measure after switching to another variation.

### Restart

Depending on the selected **Restart** mode and your playing, you can restart playback from the beginning of the loop.

- **Off** – The loop runs continuously and will not restart upon note changes.
- **First Note** – The loop restarts when a note is triggered and no other notes are already held.
- **Each Note** – The loop restarts each time a note is triggered.
- **Sync to Host** – Select this to align the loop with the beats and measures of your host application. The loop aligns to the beats and measures each time you start the transport.
- **Follow Transport** – Playback starts and stops automatically together with the transport controls in your host application.

### Start

Shifts the start of the loop in steps of 1/4 notes. The length of the loop is shortened accordingly.

### Length

Allows you to shorten the length of the loop in steps of 1/4 notes.

NOTE

The control range of **Start** and **Length** varies with the original length of the loop.

---

### Tempo

- If **Sync** is deactivated, the **Tempo** control sets the internal playback speed of the loop, in BPM. In addition, **Tempo Scale** gives you further control over the playback speed.
- If **Sync** is activated, the Tempo control is inactive.

### Sync

To synchronize the loop to the tempo of your host application, activate **Sync**.

NOTE

In the **Restart** modes **Sync to Host** and **Follow Transport**, synchronization to the host application is established automatically. In these modes, the **Sync** parameter cannot be edited.

---

### Play/Stop

Starts/Stops playback of the phrase.

### Low Key

Defines the lowest key on which the phrase is triggered.

### High Key

Defines the highest key on which the phrase is triggered.

### Center Key

Determines the MIDI note that is used as the central position for the **Key Follow** function.

### **Pitch**

Activate this option to set the pitch of the drum sounds according to the **Center Key**.

## **Performance Section**

### **Tempo Scale**

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### **Swing**

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### **Gate Scale**

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### **Vel Scale**

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### **Quantize Note Value**

This pop-up menu allows you to set up a quantization grid, in fractions of beats. You can also specify dotted and triplet values. This way, you can force the timing of the MIDI note events to play back only at the selected note value.

### **Quantize Amount**

Defines how much of the quantization grid is applied. A value of 100 % means that the MIDI note events play back only at the specified **Quantize** note value. Smaller values move the notes only partially towards the next **Quantize** note value. At a value of 0 %, no quantization is applied.

## **Filter Section**

### **Cutoff**

Controls the cutoff frequency of the filter.

### **Resonance**

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### **Envelope Amount**

Controls the cutoff modulation from the filter envelope.

### **Cutoff Velocity**

Controls the cutoff modulation from velocity.

### **Decay**

Controls the decay time of the filter envelope.

## Amp Section

### Level

Controls the overall volume of the sound.

### Velocity

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

### Decay

Controls the decay time of the amplifier envelope.

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
  - To start from scratch, load a phrase, and edit the settings.
  - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.

---

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## Anima

The Anima synth is a wavetable instrument using HALion's wavetable synthesis which crossfades the waves smoothly in real time based on an integrated wavetable envelope. This envelope makes it very easy to control the playback of the wavetable, because no further modulation settings are required. All you have to do is set up the **Speed** parameter. The modulation matrix allows you to control the playback position of the oscillator using one of the integrated LFOs, the velocity, or the modulation wheel, for example.



Anima provides two wavetable oscillators that can be used in parallel. Each oscillator features a multi-oscillator that allows you to create up to eight additional voices for each oscillator and then separately detune them and distribute them in the stereo panorama.

The sub oscillator comes with classic oscillator waves like sine, triangle, saw, square and two different pulses, and also features a noise generator. The noise generator delivers a large number of different noise types. These range from classic noises like white and pink noise over drum attacks and rhythmical noises to specifically filtered colored noises and unique circuit noises, recorded from various electronic devices. This powerful collection of noises can be used to add inharmonic frequencies to create atmospheric sound or add transients for rich and percussive attacks, for example. The integrated arpeggiator and step sequencer allows you to play rhythmic patterns and/or add modulations to the synthesis parameters using the three available controller lanes.

The oscillator is followed by a multi-mode filter that offers a large number of different filter shapes. The filter can be modulated by modulation sources like the keyboard, velocity, and LFO, but also by the controller lanes of the step sequencer, for example.

Anima includes two monophonic LFOs that can be synchronized to the host tempo and allow you to modulate a large number of modulation destinations using the modulation matrix. In addition, a user-defined envelope can be assigned to destinations like **Pitch**, **Pan**, or **Wavetable** parameters in the modulation matrix.

Anima contains six pages: **Osc1**, **Osc2**, **Sub**, **Mod**, **Voice**, and **Arp**. To show the settings for a page, click the corresponding page button.

If a page button itself contains an **On/Off** button, which is the case for the **Arp** page button, for example, you can use this to activate/deactivate the corresponding element without having to open the page first.

## Oscillator Pages

The **Osc 1** and **Osc 2** pages contain the settings for the two main oscillators.



- To show the settings for oscillator 1 or oscillator 2, click the corresponding button.
- To activate/deactivate an oscillator, click the **On/Off** button on the right of the corresponding page button.

### Select Wavetable

This pop-up menu allows you to select one of the included wavetables for the wavetable oscillator.

### Show 3D Wavetable Map/2D Wave

Toggles between displaying a single cycle of the current waveform and a topographic map of the entire wavetable.

### Retrigger Mode

- If **Free Phase** is selected, the behavior of analog synthesizers is emulated. The oscillator is running freely and continuously.
- If **Random Phase** is selected, the start phase is randomly set to a different value each time that you trigger a note. In contrast to **Free Phase**, there is no continuity in the phase of the waveform.
- If **Fixed Phase** is selected, the oscillator runs with a fixed start phase that can be specified by setting it to a value between 0 and 360 degrees.

### Octave

Adjusts the pitch in octave steps.

### Coarse

Adjusts the pitch in semitone steps.

### Fine

Adjusts the pitch in cent steps. This allows you to fine-tune the oscillator sound.

### Level

Adjusts the output level of the oscillator.

### Pan

Adjusts the position of the oscillator in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.



## Main Tab



### Legato

If **Legato** is deactivated, each note starts playback from the position cursor.

If **Legato** is activated, the first note starts playback from the position cursor, and any subsequent notes start from the current playback position, for as long as the first note is held.

This allows you to add more and more notes, all synchronized with respect to their playback position. As long as you play notes legato, the oscillator continues to run, which allows you to switch between chords without restarting the oscillator.

### Sync to Host

Allows you to sync the wavetable to the beats and measures of your host application.

### Loop Mode

- **Off:** If **Playback Direction** is set to a positive value, the wavetable plays from the position cursor to the end.  
If **Playback Direction** is set to a negative value, the wavetable plays from the position cursor to the start.
- **On:** Depending on the **Playback Direction** setting, the wavetable plays forward or backward in a loop.
- **Alt:** The wavetable plays in an alternate loop, that is, the loop is alternately played forward and backward. The first direction depends on the **Playback Direction** setting.

### Speed

Determines the rate at which the envelope plays through the wavetables. At +100%, the envelope plays back at its original speed. A value of +50% corresponds to half the original speed, and +200% to twice the original speed, for example.

This parameter is unipolar.

### Position

Determines the position in the envelope where playback starts.

### Playback Direction

Allows you to set the playback speed in smaller increments. Furthermore, this parameter determines the playback direction.

- If you enter negative values, you reverse playback, that is, the playback position moves backward through the wavetable.

### Random Position

Adds a random value to the current position when you play a note.

For example, if you want the position to vary between 25% and 75%, set **Position** to 25% and **Random Position** to 50%.

### Random Direction

Adds a random negative or positive value to the current direction when you play a note.

For example, if you want the direction to vary between -100% and +100%, set **Direction** to 0.0% and **Random Direction** to 100.0%. If you want the direction to vary within the full positive range, set **Direction** to 50% and **Random Direction** to 50%.

### Form Tab



Formants are harmonics within the spectrum of a note which are pronounced and help to define the character of an instrument. The positions of the formants in the spectrum mainly depend on the construction of an instrument, such as the body of a guitar, the form of the vocal tract in a human body, the filter settings for electronic instruments, etc. These conditions lead to specific frequency ranges that are emphasized regardless of the pitch of the note. Playing back samples or wavetables with a different pitch than the original is usually done by increasing or decreasing the playback speed. This leads to the well-known monster or Mickey Mouse effect, because all harmonics are also affected, that is, the characteristic formants are shifted. To avoid this, you can activate the **Formant** option.

#### On/Off

Activates/Deactivates the formant settings.

#### Formant

Allows you to shift the formants of the entire wavetable by a fixed value.

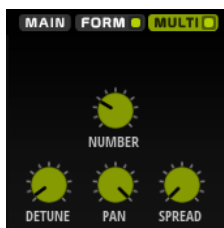
#### Key Follow

Allows you to shift the formants depending on the played note.

- A value of 100 % means that the formant frequency moves with the played note.
- A value of 0 % means that the formants are kept the same for all notes.

You can invert the behavior of the formant shift by setting **Key Follow** to negative values.

### Multi Tab



The multi-oscillator function allows you to trigger multiple voices simultaneously with each note that you play. If you activate **Multi**, the following parameters become available:

- **Number** determines the number of oscillators that play back simultaneously. You can also set fractions of numbers. For example, with a setting of 2.5, you hear two oscillators at full level and a third one at half level.

- **Detune** detunes the oscillators.
- **Pan** narrows or widens the stereo panorama. With a setting of 0 %, you create a mono signal and with 100 %, you create a stereo signal.
- **Spread** distributes the oscillators so that each oscillator plays from a different position in the wavetable.

## Sub Page

The **Sub** page contains the settings for the sub oscillator and the noise oscillator.



### Sub Oscillator Section

#### Type

Determines the wave shape of the sub oscillator. You can choose **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, or **Pulse Narrow**.

#### Retrigger Mode

- If **Free Phase** is selected, the behavior of analog synthesizers is emulated. The oscillator is running freely and continuously.
- If **Random Phase** is selected, the start phase is randomly set to a different value each time that you trigger a note. In contrast to **Free Phase**, there is no continuity in the phase of the waveform.
- If **Fixed Phase** is selected, the oscillator runs with a fixed start phase that can be specified by setting it to a value between 0 and 360 degrees.

#### Level

Adjusts the output level of the sub oscillator.

#### Pan

Adjusts the position of the oscillator in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.

### Noise Oscillator Section

The noise oscillator offers you a large amount of different noise types that can be used to add inharmonic frequencies to the overall spectrum, either for the entire sound, with looped noises or with one-shot noise samples. This allows you to add characteristic transients to percussive instruments based on samples, for example.

#### Noise Type

This pop-up menu offers you a choice of classic noises, attack transients, soundscapes, and ambience noise samples.

#### Level

Adjusts the output level of the noise oscillator.

### Sync

Activate **Sync** to synchronize the speed of the noise oscillator to the host tempo. This is particularly useful for rhythmic noises that are based on a tempo of 120 BPM.

### Pan

Determines the position of the noise in the stereo panorama. At a setting of -100%, the sound is panned hard left, and at +100%, it is panned hard right.

### Follow Pitch

If **Follow Pitch** is activated, zone pitch settings like **Octave**, **Coarse**, and **Fine**, as well as modulations like **Glide**, **Pitchbend**, or other pitch modulations, affect the duration length. A higher sample pitch leads to a shorter duration.

If **Follow Pitch** is deactivated, the duration is independent of the zone pitch and determined by the **Duration** settings.

### Loop

Activate this button to play the noise sample in a loop.

If this button is not activated, the sample is played once.

### Speed

Adjusts the playback speed of the noise sample. A setting of 800.0% equals an increase of three octaves in pitch.

### Speed Key Follow

Allows you to adjust the speed modulation by MIDI note number. At a setting of +100%, the speed doubles per octave.

### Start

Adjusts the start of the noise sample. With a value of 50%, playback starts in the middle of the sample.

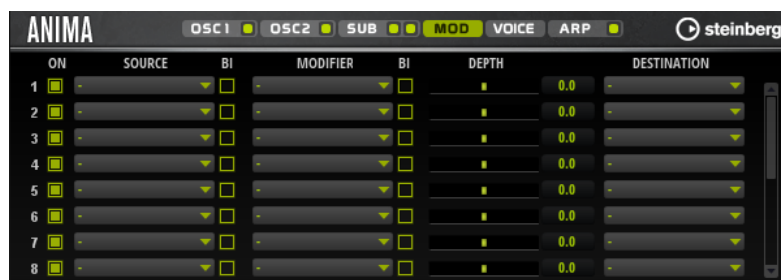
### Random Start

Selects a random playback start within a specific range around the current position.

At a setting of 100%, the playback position jumps to a random position between the specified **Start** value and the end of the noise sample.

## Mod Page

The **Mod** page contains the modulation matrix.



The modulation matrix offers you up to 16 freely assignable modulations, each with a source, a modifier, and a destination with adjustable depth. The polarity of each source and each modifier can be switched between unipolar and bipolar.

## Creating Modulations

You create modulations by selecting a source, a modifier, and a destination from the pop-up menus in the modulation matrix.

---

### PROCEDURE

1. Click the modulation **Source** field and select the modulation source.
  2. Optional: Click in the modulation **Modifier** field and select the parameter that you want to use to modify the modulation.  
This modifier is used to scale the output of the modulation source.
  3. Optional: Specify whether you want the **Source** and **Modifier** parameters to be unipolar or bipolar.
  4. Set the modulation intensity with the **Depth** parameter.
  5. Click in the modulation **Destination** field and select the parameter that you want to modulate.
- 

## Modulation Matrix Parameters

### Modulation Sources and Modulation Modifiers

The following options are available as modulation sources and as modulation modifiers.

#### LFO A/B

The LFOs A and B produce cyclic modulation signals.

#### Amp Envelope

The amplifier envelope. The shape of the envelope determines the modulation signal.

#### Filter Envelope

The filter envelope. The shape of the envelope determines the modulation signal.

#### Env 3

A freely assignable envelope. It is suitable for pan or pitch modulation, for example.

#### Key Follow

This produces an exponential modulation signal derived from the MIDI note number. Exponential means this source works with destinations such as **Pitch** or **Cutoff**.

#### Note-on Velocity

Note-on velocity can be used as modulation signal.

#### Note-on Vel Squared

The squared version of **Note-on Velocity**. The harder you press the key, the higher the modulation values.

#### Pitchbend

The position of the pitchbend wheel can be used as modulation signal.

#### Modulation Wheel

The position of the modulation wheel can be used as modulation signal.

#### Aftertouch

Aftertouch can be used as modulation signal. Some MIDI keyboards cannot send aftertouch messages. However, most sequencer software is able to produce such messages.

### Arp Controller 1-3

The 3 controllers available on this submenu correspond to the three controller lanes on the **Arp** page.

### Bus 1-8

Modulations that are sent to one of the eight busses can be reused as sources. This way, you can combine several modulations to produce more complex signals.

### Quick Control 1-8

The quick controls can be used as modulation signal.

## Unipolar vs. Bipolar Sources

The polarity of a modulation source specifies the value range that it produces. Unipolar sources modulate between 0 and +1. Bipolar sources modulate between -1 and +1.

- To change the polarity of a modulation source or modifier from unipolar to bipolar, activate its **Bipolar** button.

## Modulation Destinations

### Pitch

Modulates the pitch. For example, assign one of the LFOs to create a vibrato effect. If **Pitch** is selected, the modulation depth is set in semitones.

### Cutoff

Modulates the filter cutoff.

### Resonance

Modulates the filter resonance. Resonance changes the character of the filter.

For example, to accent the filter the harder you hit a key, assign **Velocity** to **Resonance**.

### Distortion

Modulates the filter distortion.

### Level

This modulation adds to the level setting. It can be used to create level offsets using the mod wheel, for example.

### Volume

Modulates the gain. The volume modulation multiplies with the level.

### Pan

Modulates the position of the sound in the panorama.

### Wavetable 1/2 Pitch

Modulates the **Pitch** parameter of the corresponding wavetable oscillator.

### Wavetable 1/2 Level

Modulates the **Level** parameter of the corresponding wavetable oscillator.

### Wavetable 1/2 Pan

Modulates the **Pan** parameter of the corresponding wavetable oscillator.

### Wavetable 1/2 Multi Detune

Modulates the multi-oscillator **Detune** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Multi Pan**

Modulates the multi-oscillator **Pan** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Multi Spread**

Modulates the multi-oscillator **Spread** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Multi Voices**

Modulates the multi-oscillator **Voices** parameter of the corresponding oscillator.

**Wavetable 1/2 Position**

Modulates the **Position** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Direction**

Modulates the **Direction** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Speed**

Modulates the **Speed** parameter of the corresponding wavetable oscillator.

**Wavetable 1/2 Formant Shift**

Modulates the **Formant Shift** parameter of the corresponding wavetable oscillator.

**Wavetable Sub Pitch**

Modulates the **Pitch** parameter of the wavetable sub oscillator.

**Wavetable Sub Level**

Modulates the **Level** parameter of the wavetable sub oscillator.

**Wavetable Sub Pan**

Modulates the **Pan** parameter of the wavetable sub oscillator.

**Wavetable Noise Speed**

Modulates the **Speed** parameter of the wavetable noise oscillator.

**Wavetable Noise Level**

Modulates the **Level** parameter of the wavetable noise oscillator.

**Wavetable Noise Pan**

Modulates the **Pan** parameter of the wavetable noise oscillator.

**Amp Env Attack**

Modulates the attack time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Decay**

Modulates the decay time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Sustain**

Modulates the sustain level of the amplitude envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Amp Env Release**

Modulates the release time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Attack**

Modulates the attack time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Decay**

Modulates the decay time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Sustain**

Modulates the sustain level of the filter envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Filter Env Release**

Modulates the release time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Start Level**

Modulates the start level of the user-definable envelope 3, that is, the level of the first envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Attack**

Modulates the attack time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Attack Level**

Modulates the attack level of the user-definable envelope 3, that is, the level of the second envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Decay**

Modulates the decay time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Sustain**

Modulates the sustain level of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Release**

Modulates the release time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Release Level**

Modulates the release level of the user-definable envelope 3, that is, the last user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Bus 1-8**

You can send any modulation to one of the 8 busses, for example, to produce more complex modulation signals. Select the bus that you want to send the signals to as a destination. To use the modulation that was sent to a bus, assign the corresponding bus as a modulation source.



## Voice Page



### Polyphony

If **Mono** mode is deactivated, you can use this parameter to specify how many notes can be played simultaneously.

### Mono

Activates monophonic playback.

### Retrigger

This option is only available in **Mono** mode. If **Retrigger** is activated, a note that was stolen by another note is retriggered if you still hold the stolen note when you release the new one.

This way, you can play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered, but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

### Glide

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Fingered

Activate this parameter to glide the pitch only between notes that are played legato.

### Glide Time

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

### Octave

Adjusts the pitch in octave steps.

### Pitch Key Follow

Allows you to adjust the pitch modulation based on the MIDI note number. With this parameter set to a positive value, the higher you play, the more the pitch is raised. With the parameter set to a negative value, the higher you play, the lower the pitch. At a setting of +100%, the pitch follows the played note exactly.

### Distribution

Allows you to specify how unison voices are spread in pitch. Changing the unison voice distribution will create different modulations between the unison voices.

- If this is set to 0, the distribution is linear, that is, all voices have an equal distance in their pitch offset.
- Raising the value stretches the distribution using an exponential curve, so that the first unison voices have a smaller pitch offset than the second and third.
- Decreasing the value stretches the distribution using a negative exponential curve, so that the first unison voices have a larger pitch offset than the second and third voices.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

## Filter Section

In the filter section in the lower left, you can activate and set up the filter.



### Filter On/Off

Activates/Deactivates the filter.

### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass

filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.

- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.
- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### Distortion

Adds distortion to the signal. The following distortion types are available:

- **Tube** adds warm, tube-like distortion.
- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Reduction** adds digital distortion by means of quantization noise.
- **Rate Reduction** adds digital distortion by means of aliasing.
- **Rate Reduction Key Follow** adds digital distortion by means of aliasing, but with **Key Follow**. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.

### Envelope Amount

Controls the cutoff modulation from the filter envelope.

### Cutoff Velocity

Controls the cutoff modulation from velocity.

### Cutoff Key Follow

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

## Filter Envelope

On the left on the **Env F/A** tab, you can set up the filter envelope.



### Attack

Controls the attack time of the filter envelope.

### Decay

Controls the decay time of the filter envelope.

### Sustain

Controls the sustain level of the filter envelope.

### Release

Controls the release time of the filter envelope.

## Amplifier and Amplifier Envelope

On the right of the **Env F/A** tab, you can make settings for the amplifier and the amplifier envelope.



### Amplifier Parameters

#### Level

Controls the overall volume of the sound.

#### Velocity

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

### Amplifier Envelope Parameters

#### Attack

Controls the attack time of the amplifier envelope.

#### Decay

Controls the decay time of the amplifier envelope.

#### Sustain

Controls the sustain level of the amplifier envelope.

## Release

Controls the release time of the amplifier envelope.

## Env 3 Section

The **Env 3** section provides an additional envelope that can be routed freely in the modulation matrix. This envelope is bipolar, therefore, it is particularly suited to modulate destinations like pan or pitch, for example.



The faders below the envelope display set the following parameters:

- **L0** sets the start level.
- **A** sets the attack time.
- **L1** sets the attack level.
- **D** sets the decay time.
- **S** sets the sustain level.
- **R** sets the release time.
- **L4** sets the end level.
- **Vel** determines how much the envelope intensity depends on the velocity.

If this fader is set to 0, the envelope is fully applied. Higher values reduce the intensity for lower velocities.

## LFO Section

In the **LFO** section, you can make settings for the two included LFOs.



### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.

- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

#### **Sync**

If **Sync** is activated, the frequency is set in fractions of beats.

#### **Freq**

Controls the frequency of the modulation, that is, the speed of the LFO.

#### **Phase**

Sets the initial phase of the waveform when the LFO is retriggered.

#### **Sync**

If **Sync** is activated, the frequency is set in fractions of beats.

#### **Freq**

Controls the frequency of the modulation, that is, the speed of the LFO.

#### **Phase**

Sets the initial phase of the waveform when the LFO is retriggered.

#### **Rnd (Random Phase)**

If this button is activated, each note starts with a randomized start phase.

#### NOTE

The **Phase** control cannot be used if **Rnd** is activated.

---

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

#### NOTE

The phrase does not restart upon notes that are played legato.

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### RstVar (Restart on Variation Change)

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the arpeggiator, even if no new notes or chords are triggered.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.



- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

#### NOTE

Not all phrases contain controller data.

---

#### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **As Played** is selected, the notes of the phrase use the velocity of the played note.
- If **Original + As Played** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity of the played note.

#### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

#### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

#### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

#### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

#### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

#### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

## User Mode Parameters



### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.

- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.

If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.

If **Key Mode** is set to **As Played**, the first and the last note are repeated.

- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.
- If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.
- If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.

- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

NOTE

**Key Replace** can be set for each individual variation.

---

### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up, Down, Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

### PROCEDURE

**1.** Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

**2.** Play some notes.

**3.** When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

**4.** Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.

---

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

- 1.** Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  - 2.** Repeat this procedure for all the variations that you have created.
-

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

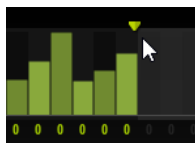
## Editing User Phrases

You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.



- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt-Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.

- To reset the velocity of all steps to 127, hold **Ctrl/Cmd - Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.  
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.
- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

#### NOTE

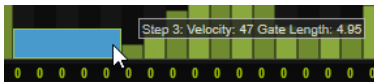
You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.

---



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step. You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

## Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**.  
If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

---

## Skylab

The Skylab synth is an instrument that produces a wide range of sounds that are perfectly suited to create cinematic or ambient soundtracks. It comes with a large number of multi-samples that provide a variety of evolving pads and soundscapes as well as typical orchestral sounds like strings, brass, and choirs, allowing you to create huge and epic sounds. Furthermore, percussive sample sets of orchestral percussion and taikos are available that can be used with the integrated arpeggiator to create rhythmic patterns, for example.

Skylab's oscillator section can be switched between **Sample Mode** and **Grain Mode**.

**Grain Mode** uses granular synthesis with up to eight grain streams, which allows you to produce even more variations of the source samples. The oscillator is followed by a multi-mode filter that offers a large number of different filter shapes. The filter can be modulated by modulation sources like the keyboard, velocity, and LFO, but also by the controller lanes of the step sequencer, for example. Skylab includes two monophonic LFOs that can be synchronized to the host tempo and allow you to modulate a large number of modulation destinations using the modulation matrix. In addition, a third envelope is included that can be assigned to destinations like **Pitch**, **Pan**, or **Wavetable** parameters in the modulation matrix.



Skylab contains four pages: **Osc**, **Mod**, **Voice**, and **Arp**. To show the settings for a page, click the corresponding page button.

The button for the **Arp** page also contains an **On/Off** button for the arpeggiator.

### Osc Page

On this page, you can specify whether you want to use a sample or a grain oscillator and make settings for the oscillator.

#### Sample Mode

In **Sample Mode**, you can load and play different multi-samples.



## Grain Mode

In **Grain Mode**, Skylab uses a grain oscillator for playback.



### Position

You can set the playback position of the grains manually. For example, at a setting of 50%, the playback position is in the middle of the sample. The playback position is updated with every new grain.

### Random Position

Selects a random playback position within a specific range around the current position. At a setting of 100%, the playback position jumps to a random position between the start and the end of the sample. The random playback position is calculated separately for each channel of the sample, at the start of a new grain. This can be used to widen the panorama of the sound.

### Duration

Increases the grain period by a factor ranging from 1 to 1000.

For very short grains, the sound is assigned the pitch of the frequency at which the grains repeat. For grains longer than 30 ms, the sound assumes the pitch of the original sample. This is the case for **Center Key C3** if the **Duration** is set to a value above 10, for example.

### Random Duration

Sets the random grain duration. This duration is calculated at the start of a new grain.

### Duration Key Follow

Determines how the grain duration changes with the notes you play. It is mostly used with short durations. Longer durations sound with the original pitch of the sample and therefore, do not need to follow the keyboard.

With a **Duration** of 1 and a **Duration Key Follow** setting of 100%, the difference in pitch between two keys is one semitone, which corresponds to the standard keyboard tuning. Longer durations lead to an audible volume modulation that is different for the different keys. To apply the same volume modulation with each key, set **Duration Key Follow** to 0%.



#### NOTE

The volume modulation is only audible if the grain is long and if you only use a few grains.

---

#### **Pitch Interval**

Allows you to specify an interval between -12 and +12 semitones. The grains are played randomly at their original pitch, or are transposed according to the pitch interval. This parameter is suitable for longer grain durations.

#### **Pitch Random**

Sets the random pitch range in semitones and cents. At a setting of +12, the random pitch values lie between -12 and +12 semitones. The random pitch is calculated separately for each channel of the sample, at the start of a new grain. This parameter can be used to enrich the sound.

#### **Level**

Adjusts the overall level of the grain oscillator. When you increase the number of grains, it might become necessary to lower the oscillator level. When you play back a very quiet portion of a sample, you can use this control to raise the level.

#### **Random Level**

Sets a random level for each new grain. At a setting of 100%, the level varies between a factor of 0 and 2 of the original level. The random level is calculated separately for each channel of the sample, at the start of a new grain. This can be used to randomize the panorama of the sound.

#### **Width**

Narrows the stereo width of the grain oscillator. It is applied after the grain oscillator and does not affect the stereo width of the actual sample. At a setting of 0%, the output of the grain oscillator is mono.

#### **Auto Gain**

Allows you to automatically adjust the level of grains using quieter sample parts. This way, you get a more homogeneous signal, and you can use a quiet part of a sample as the source.

#### **Grains**

Allows you to specify the number of grains, from 1 to 8. For example, with a setting of 4, you obtain 4 grains per period of the grain duration.

To hear the effect of this setting, you have to play a new note.

#### **Fixed Pitch**

Plays the sample at a fixed pitch.

- If this button is activated, the sample follows the pitch of the keyboard. The root key is C3.
- If this button is deactivated, the sample plays at its original pitch, and any pitch modulations for the zone have no effect.

## Mod Page

The **Mod** page contains the modulation matrix.



The modulation matrix offers you up to 16 freely assignable modulations, each with a source, a modifier, and a destination with adjustable depth. The polarity of each source and each modifier can be switched between unipolar and bipolar.

## Creating Modulations

You create modulations by selecting a source, a modifier, and a destination from the pop-up menus in the modulation matrix.

---

### PROCEDURE

1. Click the modulation **Source** field and select the modulation source.
  2. Optional: Click in the modulation **Modifier** field and select the parameter that you want to use to modify the modulation.  
This modifier is used to scale the output of the modulation source.
  3. Optional: Specify whether you want the **Source** and **Modifier** parameters to be unipolar or bipolar.
  4. Set the modulation intensity with the **Depth** parameter.
  5. Click in the modulation **Destination** field and select the parameter that you want to modulate.
- 

## Modulation Matrix Parameters

### Modulation Sources and Modulation Modifiers

The following options are available as modulation sources and as modulation modifiers.

#### LFO A/B

The LFOs A and B produce cyclic modulation signals.

#### Amp Envelope

The amplifier envelope. The shape of the envelope determines the modulation signal.

#### Filter Envelope

The filter envelope. The shape of the envelope determines the modulation signal.

#### Env 3

A freely assignable envelope. It is suitable for pan or pitch modulation, for example.

### **Key Follow**

This produces an exponential modulation signal derived from the MIDI note number. Exponential means this source works with destinations such as **Pitch** or **Cutoff**.

### **Note-on Velocity**

Note-on velocity can be used as modulation signal.

### **Note-on Vel Squared**

The squared version of **Note-on Velocity**. The harder you press the key, the higher the modulation values.

### **Pitchbend**

The position of the pitchbend wheel can be used as modulation signal.

### **Modulation Wheel**

The position of the modulation wheel can be used as modulation signal.

### **Aftertouch**

Aftertouch can be used as modulation signal. Some MIDI keyboards cannot send aftertouch messages. However, most sequencer software is able to produce such messages.

### **Arp Controller 1-3**

The 3 controllers available on this submenu correspond to the three controller lanes on the **Arp** page.

### **Bus 1-8**

Modulations that are sent to one of the eight busses can be reused as sources. This way, you can combine several modulations to produce more complex signals.

### **Quick Control 1-8**

The quick controls can be used as modulation signal.

## **Unipolar vs. Bipolar Sources**

The polarity of a modulation source specifies the value range that it produces. Unipolar sources modulate between 0 and +1. Bipolar sources modulate between -1 and +1.

- To change the polarity of a modulation source or modifier from unipolar to bipolar, activate its **Bipolar** button.

## **Modulation Destinations**

### **Pitch**

Modulates the pitch. For example, assign one of the LFOs to create a vibrato effect. If **Pitch** is selected, the modulation depth is set in semitones.

### **Cutoff**

Modulates the filter cutoff.

### **Resonance**

Modulates the filter resonance. Resonance changes the character of the filter. For example, to accent the filter the harder you hit a key, assign **Velocity** to **Resonance**.

### **Distortion**

Modulates the filter distortion.

**Level**

This modulation adds to the level setting. It can be used to create level offsets using the mod wheel, for example.

**Volume**

Modulates the gain. The volume modulation multiplies with the level.

**Pan**

Modulates the position of the sound in the panorama.

**Grain Position**

Modulates the playback position. The modulation is not continuous, but it is updated at the start of each grain.

**Grain Duration**

Modulates the grain duration, that is, the frequency at which the grains repeat. The maximum modulation range at a modulation depth of 100 % is -5 to +5 octaves.

**Grain Pitch**

Modulates the pitch of a grain. The modulation is not continuous, but it is updated at the start of a new grain. For continuous pitch modulation, use **Pitch** instead of **Grain Pitch** as destination and make sure that **Follow Zone Pitch** is activated in the grain oscillator.

**Grain Formant**

Modulates the pitch of the source sample independently from the grain duration. This results in formant shifting for short durations.

**Grain Level**

Modulates the grain level. The modulation is not continuous, but it is updated at the start of each new grain.

**Amp Env Attack**

Modulates the attack time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Decay**

Modulates the decay time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Sustain**

Modulates the sustain level of the amplitude envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Amp Env Release**

Modulates the release time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Attack**

Modulates the attack time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Decay**

Modulates the decay time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Sustain**

Modulates the sustain level of the filter envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Filter Env Release

Modulates the release time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Env 3 Start Level

Modulates the start level of the user-definable envelope 3, that is, the level of the first envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Env 3 Attack

Modulates the attack time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Env 3 Attack Level

Modulates the attack level of the user-definable envelope 3, that is, the level of the second envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Env 3 Decay

Modulates the decay time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Env 3 Sustain

Modulates the sustain level of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Env 3 Release

Modulates the release time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Env 3 Release Level

Modulates the release level of the user-definable envelope 3, that is, the last user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Bus 1-8

You can send any modulation to one of the 8 busses, for example, to produce more complex modulation signals. Select the bus that you want to send the signals to as a destination. To use the modulation that was sent to a bus, assign the corresponding bus as a modulation source.

## Voice Page



## Voice Section

### Polyphony

If **Mono** mode is deactivated, you can use this parameter to specify how many notes can be played simultaneously.

### Mono

Activates monophonic playback.

### Retrigger

This option is only available in **Mono** mode. If **Retrigger** is activated, a note that was stolen by another note is retriggered if you still hold the stolen note when you release the new one.

This way, you can play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered, but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

## Glide Section

### Glide

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Fingered

Activate this parameter to glide the pitch only between notes that are played legato.

### Glide Time

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

## Pitch Section

### Octave

Adjusts the pitch in octave steps.

### Coarse

Adjusts the pitch in semitone steps.

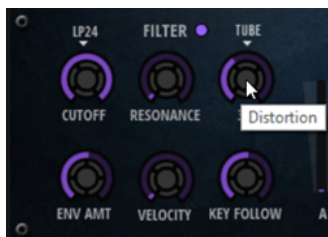
### Fine

Adjusts the pitch in cent steps. This allows you to fine-tune the oscillator sound.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

## Filter Section



### Filter On/Off

Activates/Deactivates the filter.

### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.

- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.
- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### Distortion

Adds distortion to the signal. The following distortion types are available:

- **Tube** adds warm, tube-like distortion.
- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Reduction** adds digital distortion by means of quantization noise.
- **Rate Reduction** adds digital distortion by means of aliasing.
- **Rate Reduction Key Follow** adds digital distortion by means of aliasing, but with **Key Follow**. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.

### Envelope Amount

Controls the cutoff modulation from the filter envelope.

### Cutoff Velocity

Controls the cutoff modulation from velocity.

### Cutoff Key Follow

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

## Filter Envelope

On the left on the **Env F/A** tab, you can set up the filter envelope.



### Attack

Controls the attack time of the filter envelope.

### Decay

Controls the decay time of the filter envelope.

### Sustain

Controls the sustain level of the filter envelope.



### Release

Controls the release time of the filter envelope.

## Amplifier and Amplifier Envelope

On the right of the **Env F/A** tab, you can make settings for the amplifier and the amplifier envelope.



### Amplifier Parameters

#### Level

Controls the overall volume of the sound.

#### Velocity

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

### Amplifier Envelope Parameters

#### Attack

Controls the attack time of the amplifier envelope.

#### Decay

Controls the decay time of the amplifier envelope.

#### Sustain

Controls the sustain level of the amplifier envelope.

#### Release

Controls the release time of the amplifier envelope.

## Env3 Section

The **Env 3** section provides an additional envelope that can be routed freely in the modulation matrix. This envelope is bipolar, therefore, it is particularly suited to modulate destinations like pan or pitch, for example.



The faders below the envelope display set the following parameters:

- **L0** sets the start level.
- **A** sets the attack time.

- **L1** sets the attack level.
- **D** sets the decay time.
- **S** sets the sustain level.
- **R** sets the release time.
- **L4** sets the end level.
- **Vel** determines how much the envelope intensity depends on the velocity.  
If this fader is set to 0, the envelope is fully applied. Higher values reduce the intensity for lower velocities.

## LFO Section

In the **LFO** section, you can make settings for LFO A and LFO B.



### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Sync

If **Sync** is activated, the frequency is set in fractions of beats.

### Freq

Controls the frequency of the modulation, that is, the speed of the LFO.

### Phase

Sets the initial phase of the waveform when the LFO is retriggered.

### Rnd (Random Phase)

If this button is activated, each note starts with a randomized start phase.

NOTE

The **Phase** control cannot be used if **Rnd** is activated.

---

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

#### NOTE

The phrase does not restart upon notes that are played legato.

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### RstVar (Restart on Variation Change)

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the arpeggiator, even if no new notes or chords are triggered.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

#### NOTE

Not all phrases contain controller data.

---

### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **As Played** is selected, the notes of the phrase use the velocity of the played note.
- If **Original + As Played** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity of the played note.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

## User Mode Parameters

### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

#### NOTE

**Key Replace** can be set for each individual variation.

---

### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up, Down, Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

PROCEDURE

1. Click **Record MIDI Output**.  
The arrow in the **Drag MIDI** field starts flashing to indicate record mode.
2. Play some notes.
3. When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

4. Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.
- 

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop, Sync, Hold, Trigger Mode, Restart Mode, Key Mode, Vel Mode, Low/High Key, and Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity, Gate Length, and Transpose** value.

By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

## Editing User Phrases

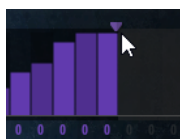
You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.





- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



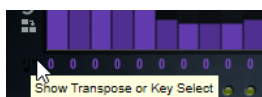
## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt-Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd-Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.  
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.
- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

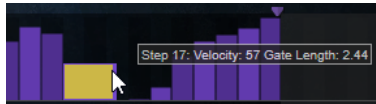
### NOTE

You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step. You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the modulation matrix, you can modulate any of the destinations with the MIDI controller sequence.

### Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**. If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

---

## Raven

Raven provides the sound of a classical Italian concert grand with six velocity layers and adjustable sustain resonances. Its **Tone** control allows you to adapt the tonal range from very soft romantic to more intense colors. In addition, you can modify the character of the note-off behavior by adding a dedicated note-off layer.



### Tone

Raven comes with 6 different velocity layers. The **Tone** control allows you to specify how these layers are used.

- If the **Tone** control is in middle position, different input velocities trigger all 6 layers.
- If you turn the knob to the left, the number of hard velocity layers that are used in the sound is reduced, that is, the sound becomes softer.
- If you turn the knob to the right, the number of soft velocity layers that are used is reduced, that is, the sound becomes harder.

#### NOTE

The **Tone** control is independent from the influence that the velocity has on the level of the piano. That means that you can always play the entire level range, even with the softest or the hardest layer.

---

### Dynamics – Curve

Allows you to specify how the input velocity is affecting the level of the piano. The curve that is used by this control goes from linear to exponential/negative exponential. The curve display on the right reflects the current setting.

### Dynamics – Minimum Level

Specifies the minimum level for the note that is playing the lowest MIDI velocity. This allows you to simulate the behavior of real pianos where you cannot play a note without a minimum amount of pressure. If you set this control to the lowest setting, you get a behavior that is more common with electronic instruments.

### Sustain Resonance

Allows you to decide whether or not to use the additional sustain resonance layer of the piano.

If this option is activated, the sustain resonance layers are played when the sustain pedal is held and notes are played. You can adjust the level of the resonance layer with the control on the right.

#### NOTE

The piano also allows for repedaling, which means that the sustain resonances will also be blended in when the sustain pedal is pressed again shortly after notes have been played.

---

If you do not want to use the sustain resonance layers, deactivate this option to save CPU power.

### Note Off

Allows you to decide whether or not to use an additional note-off layer.

If this option is deactivated, the sound of the piano stops faster when a key is released. If this option is activated, the release is slightly longer and smoother.

### Polyphony

Determines the number of notes that can be played before notes are stolen.

## Eagle

Eagle provides the sound of a classical German concert grand with 12 velocity layers and adjustable sustain resonances. Its **Tone** control allows you to adapt the tonal range from very soft romantic to more intense colors. In addition, you can modify the character of the note-off behavior by adding a dedicated note-off layer.



### Tone

Eagle comes with 12 different velocity layers. The **Tone** control allows you to specify how these layers are used.

- If the **Tone** control is in middle position, different input velocities trigger all 12 layers.
- If you turn the knob to the left, the number of hard velocity layers that are used in the sound is reduced, that is, the sound becomes softer.
- If you turn the knob to the right, the number of soft velocity layers that are used is reduced, that is, the sound becomes harder.

### NOTE

The **Tone** control is independent from the influence that the velocity has on the level of the piano. That means that you can always play the entire level range, even with the softest or the hardest layer.

### Dynamics – Curve

Allows you to specify how the input velocity is affecting the level of the piano. The curve that is used by this control goes from linear to exponential/negative exponential. The curve display on the right reflects the current setting.

### Dynamics – Minimum Level

Specifies the minimum level for the note that is playing the lowest MIDI velocity. This allows you to simulate the behavior of real pianos where you cannot play a note without a minimum amount of pressure. If you set this control to the lowest setting, you get a behavior that is more common with electronic instruments.

### Sustain Resonance

Allows you to decide whether or not to use the additional sustain resonance layer of the piano.

If this option is activated, the sustain resonance layers are played when the sustain pedal is held and notes are played. You can adjust the level of the resonance layer with the control on the right.

#### NOTE

The piano also allows for repedaling, which means that the sustain resonances will also be blended in when the sustain pedal is pressed again shortly after notes have been played.

If you do not want to use the sustain resonance layers, deactivate this option to save CPU power.

#### Note Off

Allows you to decide whether or not to use an additional note-off layer.

If this option is deactivated, the sound of the piano stops faster when a key is released.

If this option is activated, the release is slightly longer and smoother.

#### Polyphony

Determines the number of notes that can be played before notes are stolen.

## Hot Brass

Hot Brass delivers a broad range of brass sounds and articulations suitable for rock, soul, funk, and other music styles that need sharp and accentuated brass tone colors. This instrument is particularly suited to play concise licks and riffs.

The instrument's sample oscillators are followed by a synthesis section with a flexible filter where you can modify the sounds further. With the FlexPhraser functionality on the **Arp** page, you can play typical brass phrases and licks with a single note on your keyboard.



Hot Brass contains four pages: **Main**, **Mod**, **Voice**, and **Arp**. To show the settings for a page, click the corresponding page button.

The button for the **Arp** page also contains an **On/Off** button for the arpeggiator.

## Main Page

The **Main** page allows you to select the sample for Hot Brass and to make basic pitch settings.



### Select Samples

Allows you to choose from a range of included samples. Hot Brass provides three differently mixed sections and a pure saxophone section. You can add additional authenticity to your play using the included falls, growls, doits, shakes, and staccato articulations.

### Coarse

Adjusts the pitch in semitone steps.

### Fine

Allows you to fine-tune the pitch in cent steps.

### Random Pitch

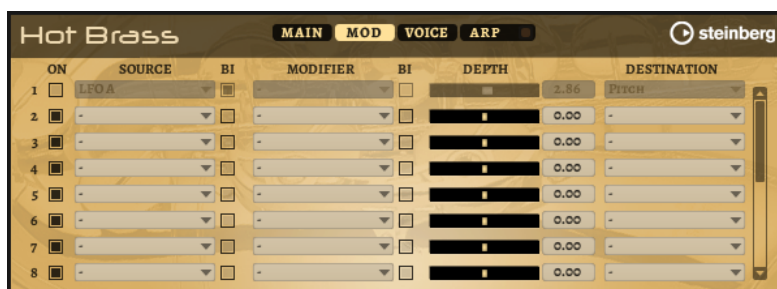
Allows you to randomly offset the pitch with each played note. Higher values cause stronger variations. At the maximum setting, the random offsets can vary from -60 cents to +60 cents.

### Pan

Defines the position of the instrument in the stereo panorama.

## Mod Page

The **Mod** page contains the modulation matrix.



The modulation matrix offers you up to 16 freely assignable modulations, each with a source, a modifier, and a destination with adjustable depth. The polarity of each source and each modifier can be switched between unipolar and bipolar.

## Creating Modulations

You create modulations by selecting a source, a modifier, and a destination from the pop-up menus in the modulation matrix.

---

### PROCEDURE

1. Click the modulation **Source** field and select the modulation source.
  2. Optional: Click in the modulation **Modifier** field and select the parameter that you want to use to modify the modulation.  
This modifier is used to scale the output of the modulation source.
  3. Optional: Specify whether you want the **Source** and **Modifier** parameters to be unipolar or bipolar.
  4. Set the modulation intensity with the **Depth** parameter.
  5. Click in the modulation **Destination** field and select the parameter that you want to modulate.
- 

## Modulation Matrix Parameters

### Modulation Sources and Modulation Modifiers

The following options are available as modulation sources and as modulation modifiers.

#### LFO A/B

The LFOs A and B produce cyclic modulation signals.

#### Amp Envelope

The amplifier envelope. The shape of the envelope determines the modulation signal.

#### Filter Envelope

The filter envelope. The shape of the envelope determines the modulation signal.

#### Env 3

A freely assignable envelope. It is suitable for pan or pitch modulation, for example.

#### Key Follow

This produces an exponential modulation signal derived from the MIDI note number. Exponential means this source works with destinations such as **Pitch** or **Cutoff**.

#### Note-on Velocity

Note-on velocity can be used as modulation signal.

#### Note-on Vel Squared

The squared version of **Note-on Velocity**. The harder you press the key, the higher the modulation values.

#### Pitchbend

The position of the pitchbend wheel can be used as modulation signal.

#### Modulation Wheel

The position of the modulation wheel can be used as modulation signal.

#### Aftertouch

Aftertouch can be used as modulation signal. Some MIDI keyboards cannot send aftertouch messages. However, most sequencer software is able to produce such messages.



### Arp Controller 1-3

The 3 controllers available on this submenu correspond to the three controller lanes on the **Arp** page.

### Bus 1-8

Modulations that are sent to one of the eight busses can be reused as sources. This way, you can combine several modulations to produce more complex signals.

### Quick Control 1-8

The quick controls can be used as modulation signal.

## Unipolar vs. Bipolar Sources

The polarity of a modulation source specifies the value range that it produces. Unipolar sources modulate between 0 and +1. Bipolar sources modulate between -1 and +1.

- To change the polarity of a modulation source or modifier from unipolar to bipolar, activate its **Bipolar** button.

## Modulation Destinations

### Pitch

Modulates the pitch. For example, assign one of the LFOs to create a vibrato effect. If **Pitch** is selected, the modulation depth is set in semitones.

### Cutoff

Modulates the filter cutoff.

### Resonance

Modulates the filter resonance. Resonance changes the character of the filter.

For example, to accent the filter the harder you hit a key, assign **Velocity** to **Resonance**.

### Distortion

Modulates the filter distortion.

### Level

This modulation adds to the level setting. It can be used to create level offsets using the mod wheel, for example.

### Volume

Modulates the gain. The volume modulation multiplies with the level.

### Pan

Modulates the position of the sound in the panorama.

### Amp Env Attack

Modulates the attack time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Amp Env Decay

Modulates the decay time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Amp Env Sustain

Modulates the sustain level of the amplitude envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.



**Amp Env Release**

Modulates the release time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Attack**

Modulates the attack time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Decay**

Modulates the decay time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Sustain**

Modulates the sustain level of the filter envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Filter Env Release**

Modulates the release time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Start Level**

Modulates the start level of the user-definable envelope 3, that is, the level of the first envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Attack**

Modulates the attack time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Attack Level**

Modulates the attack level of the user-definable envelope 3, that is, the level of the second envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Decay**

Modulates the decay time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Sustain**

Modulates the sustain level of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Release**

Modulates the release time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Release Level**

Modulates the release level of the user-definable envelope 3, that is, the last user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Bus 1-8**

You can send any modulation to one of the 8 busses, for example, to produce more complex modulation signals. Select the bus that you want to send the signals to as a

destination. To use the modulation that was sent to a bus, assign the corresponding bus as a modulation source.

## Voice Page



### Polyphony

If **Mono** mode is deactivated, you can use this parameter to specify how many notes can be played simultaneously.

### Mono

Activates monophonic playback.

### Retrigger

This option is only available in **Mono** mode. If **Retrigger** is activated, a note that was stolen by another note is retriggered if you still hold the stolen note when you release the new one.

This way, you can play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.  
To minimize discontinuities, use the **Fade Out** parameter of the zone.
- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered, but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

### Glide

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Fingered

Activate this parameter to glide the pitch only between notes that are played legato.

### Glide Time

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

## Filter Section



### Filter On/Off

Activates/Deactivates the filter.

### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.

- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.
- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### Distortion

Adds distortion to the signal. The following distortion types are available:

- **Tube** adds warm, tube-like distortion.
- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Reduction** adds digital distortion by means of quantization noise.
- **Rate Reduction** adds digital distortion by means of aliasing.
- **Rate Reduction Key Follow** adds digital distortion by means of aliasing, but with **Key Follow**. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.

### Envelope Amount

Controls the cutoff modulation from the filter envelope.

### Cutoff Velocity

Controls the cutoff modulation from velocity.

### Cutoff Key Follow

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

## Filter Envelope

On the left on the **Env F/A** tab, you can set up the filter envelope.



### Attack

Controls the attack time of the filter envelope.

### Decay

Controls the decay time of the filter envelope.

### Sustain

Controls the sustain level of the filter envelope.

### Release

Controls the release time of the filter envelope.

## Amplifier and Amplifier Envelope

On the right of the **Env F/A** tab, you can make settings for the amplifier and the amplifier envelope.



### Amplifier Parameters

#### Level

Controls the overall volume of the sound.

#### Velocity

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

### Amplifier Envelope Parameters

#### Attack

Controls the attack time of the amplifier envelope.

#### Decay

Controls the decay time of the amplifier envelope.

#### Sustain

Controls the sustain level of the amplifier envelope.

#### Release

Controls the release time of the amplifier envelope.

## Env 3 Section

The **Env 3** section provides an additional envelope that can be routed freely in the modulation matrix. This envelope is bipolar, therefore, it is particularly suited to modulate destinations like pan or pitch, for example.



The faders below the envelope display set the following parameters:

- **L0** sets the start level.
- **A** sets the attack time.
- **L1** sets the attack level.
- **D** sets the decay time.
- **S** sets the sustain level.
- **R** sets the release time.
- **L4** sets the end level.
- **Vel** determines how much the envelope intensity depends on the velocity.  
If this fader is set to 0, the envelope is fully applied. Higher values reduce the intensity for lower velocities.

## LFO Section

In the **LFO** section, you can make settings for LFO A and LFO B.



### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Sync

If **Sync** is activated, the frequency is set in fractions of beats.

### Freq

Controls the frequency of the modulation, that is, the speed of the LFO.

### Phase

Sets the initial phase of the waveform when the LFO is retriggered.

### Rnd (Random Phase)

If this button is activated, each note starts with a randomized start phase.

NOTE

The **Phase** control cannot be used if **Rnd** is activated.

---

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

#### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

#### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

#### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

#### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

#### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

#### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

#### NOTE

The phrase does not restart upon notes that are played legato.

---



- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

#### **RstVar (Restart on Variation Change)**

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the arpeggiator, even if no new notes or chords are triggered.

#### **Key Mode**

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

#### **NOTE**

Not all phrases contain controller data.

---

#### **Vel Mode**

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **As Played** is selected, the notes of the phrase use the velocity of the played note.
- If **Original + As Played** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity of the played note.

#### **Swing**

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

#### **Gate Scale**

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

#### **Vel Scale**

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

#### **Octaves**

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

#### **Velocity Range**

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

### User Mode Parameters

#### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

#### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Random** is selected, the notes are arpeggiated in random order.

#### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

#### NOTE

**Key Replace** can be set for each individual variation.

---

### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

#### NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

#### NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.
- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up**, **Down**, **Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

#### PROCEDURE

1. Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

2. Play some notes.
3. When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

4. Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.
- 

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

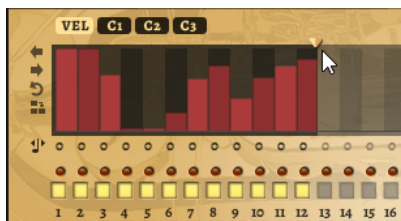
By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

## Editing User Phrases

You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.
- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



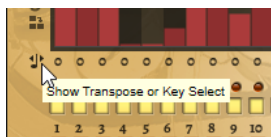
## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt-Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd-Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.  
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.
- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

### NOTE

You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.



## Adjusting the Gate Length

For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step. You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

### Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left**.  
If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase**.
- To duplicate short phrases, click **Duplicate Phrase**.

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated entirely.

---

## Studio Strings

Studio Strings delivers a broad range of string sounds and articulations comprising solo strings, small chamber, and full orchestra sections.



The instrument's sample oscillators are followed by a synthesis section with a flexible filter where you can modify the sounds further. With the FlexPhraser functionality on the **Arp** page, you can play typical phrases with a single note on your keyboard. Studio Strings contains four pages: **Main**, **Mod**, **Voice**, and **Arp**. To show the settings for a page, click the corresponding page button.

The button for the **Arp** page also contains an **On/Off** button for the arpeggiator.

## Main Page

The **Main** page allows you to select the sample for Studio Strings and to make basic pitch settings.



### Select Samples

Allows you to choose from a range of included samples.

### Coarse

Adjusts the pitch in semitone steps.

### Fine

Allows you to fine-tune the pitch in cent steps.

### Random Pitch

Allows you to randomly offset the pitch with each played note. Higher values cause stronger variations. At the maximum setting, the random offsets can vary from -60 cents to +60 cents.

## Pan

Defines the position of the instrument in the stereo panorama.

## Mod Page

The **Mod** page contains the modulation matrix.



The modulation matrix offers you up to 16 freely assignable modulations, each with a source, a modifier, and a destination with adjustable depth. The polarity of each source and each modifier can be switched between unipolar and bipolar.

## Creating Modulations

You create modulations by selecting a source, a modifier, and a destination from the pop-up menus in the modulation matrix.

---

### PROCEDURE

1. Click the modulation **Source** field and select the modulation source.
  2. Optional: Click in the modulation **Modifier** field and select the parameter that you want to use to modify the modulation.  
This modifier is used to scale the output of the modulation source.
  3. Optional: Specify whether you want the **Source** and **Modifier** parameters to be unipolar or bipolar.
  4. Set the modulation intensity with the **Depth** parameter.
  5. Click in the modulation **Destination** field and select the parameter that you want to modulate.
- 

## Modulation Matrix Parameters

### Modulation Sources and Modulation Modifiers

The following options are available as modulation sources and as modulation modifiers.

#### LFO A/B

The LFOs A and B produce cyclic modulation signals.

#### Amp Envelope

The amplifier envelope. The shape of the envelope determines the modulation signal.

#### Filter Envelope

The filter envelope. The shape of the envelope determines the modulation signal.

#### Env 3

A freely assignable envelope. It is suitable for pan or pitch modulation, for example.



### **Key Follow**

This produces an exponential modulation signal derived from the MIDI note number. Exponential means this source works with destinations such as **Pitch** or **Cutoff**.

### **Note-on Velocity**

Note-on velocity can be used as modulation signal.

### **Note-on Vel Squared**

The squared version of **Note-on Velocity**. The harder you press the key, the higher the modulation values.

### **Pitchbend**

The position of the pitchbend wheel can be used as modulation signal.

### **Modulation Wheel**

The position of the modulation wheel can be used as modulation signal.

### **Aftertouch**

Aftertouch can be used as modulation signal. Some MIDI keyboards cannot send aftertouch messages. However, most sequencer software is able to produce such messages.

### **Arp Controller 1-3**

The 3 controllers available on this submenu correspond to the three controller lanes on the **Arp** page.

### **Bus 1-8**

Modulations that are sent to one of the eight busses can be reused as sources. This way, you can combine several modulations to produce more complex signals.

### **Quick Control 1-8**

The quick controls can be used as modulation signal.

## **Unipolar vs. Bipolar Sources**

The polarity of a modulation source specifies the value range that it produces. Unipolar sources modulate between 0 and +1. Bipolar sources modulate between -1 and +1.

- To change the polarity of a modulation source or modifier from unipolar to bipolar, activate its **Bipolar** button.

## **Modulation Destinations**

### **Pitch**

Modulates the pitch. For example, assign one of the LFOs to create a vibrato effect. If **Pitch** is selected, the modulation depth is set in semitones.

### **Cutoff**

Modulates the filter cutoff.

### **Resonance**

Modulates the filter resonance. Resonance changes the character of the filter. For example, to accent the filter the harder you hit a key, assign **Velocity** to **Resonance**.

### **Distortion**

Modulates the filter distortion.

**Level**

This modulation adds to the level setting. It can be used to create level offsets using the mod wheel, for example.

**Volume**

Modulates the gain. The volume modulation multiplies with the level.

**Pan**

Modulates the position of the sound in the panorama.

**Amp Env Attack**

Modulates the attack time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Decay**

Modulates the decay time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Amp Env Sustain**

Modulates the sustain level of the amplitude envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Amp Env Release**

Modulates the release time of the amplitude envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Attack**

Modulates the attack time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Decay**

Modulates the decay time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Filter Env Sustain**

Modulates the sustain level of the filter envelope. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Filter Env Release**

Modulates the release time of the filter envelope. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Start Level**

Modulates the start level of the user-definable envelope 3, that is, the level of the first envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

**Env 3 Attack**

Modulates the attack time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

**Env 3 Attack Level**

Modulates the attack level of the user-definable envelope 3, that is, the level of the second envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Env 3 Decay

Modulates the decay time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Env 3 Sustain

Modulates the sustain level of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Env 3 Release

Modulates the release time of the user-definable envelope 3. This modulation destination cannot be modulated continuously. The time is updated only when the segment starts.

### Env 3 Release Level

Modulates the release level of the user-definable envelope 3, that is, the last user envelope node. This modulation destination cannot be modulated continuously. The level is updated only when the segment starts.

### Bus 1-8

You can send any modulation to one of the 8 busses, for example, to produce more complex modulation signals. Select the bus that you want to send the signals to as a destination. To use the modulation that was sent to a bus, assign the corresponding bus as a modulation source.

## Voice Page



### Polyphony

If **Mono** mode is deactivated, you can use this parameter to specify how many notes can be played simultaneously.

### Mono

Activates monophonic playback.

### Retrigger

This option is only available in **Mono** mode. If **Retrigger** is activated, a note that was stolen by another note is retriggered if you still hold the stolen note when you release the new one.

This way, you can play trills by holding one note and quickly and repeatedly pressing and releasing another note, for example.

### Trigger Mode

Defines the trigger behavior for new notes.

- **Normal** triggers a new note when the previous note gets stolen. The sample and the envelope of the new note are triggered from the start.

To minimize discontinuities, use the **Fade Out** parameter of the zone.

- **Resume** does not always trigger a new note.  
If the new note stays within the same zone, the envelope is retriggered, but resumes at the level of the stolen note. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Legato** does not always trigger a new note.  
If the new note stays within the same zone, the envelope keeps running. The pitch of the zone is set to the new note.  
If the new note plays in a different zone, the sample and the envelope of the new note are triggered from the start.
- **Resume Keeps Zone** does not trigger a new note upon note stealing. The envelope resumes at the level of the stolen note and the pitch of the zone is set to the new note, even if the new note plays in a different zone.
- **Legato Keeps Zone** does not trigger a new note upon note stealing. The envelope keeps running and the pitch of the zone is set to the new note, even if the new note plays in a different zone.

### Glide

Allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.

### Fingered

Activate this parameter to glide the pitch only between notes that are played legato.

### Glide Time

Sets the glide time, that is, the time it takes to bend the pitch from one note to the next.

### Start Range

Activate **Start Range** to use a shorter sample attack for notes that are played legato in **Mono** mode. This allows for a more realistic transition between notes, especially in combination with the **Glide** parameter. Use the **Attack Time** of the amplifier envelope to shape the effective attack of a note.

#### NOTE

The **Start Range** affects only sustained articulations. For staccato, pizzicato, and crescendo articulations, it has no effect.

---

### Pitchbend Up/Pitchbend Down

Determines the range of the modulation that is applied when you move the pitchbend wheel.

## Filter Section



### Filter On/Off

Activates/Deactivates the filter.

### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.
- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Cutoff

Controls the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher settings, the filter self-oscillates, which results in a ringing tone.

### Distortion

Adds distortion to the signal. The following distortion types are available:

- **Tube** adds warm, tube-like distortion.
- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Reduction** adds digital distortion by means of quantization noise.
- **Rate Reduction** adds digital distortion by means of aliasing.
- **Rate Reduction Key Follow** adds digital distortion by means of aliasing, but with **Key Follow**. The rate reduction follows the keyboard, so the higher you play, the higher the sample rate.

### Envelope Amount

Controls the cutoff modulation from the filter envelope.

### Cutoff Velocity

Controls the cutoff modulation from velocity.

### Cutoff Key Follow

Adjusts the cutoff modulation using the note number. Increase this parameter to raise the cutoff with higher notes. At 100%, the cutoff follows the played pitch exactly.

## Filter Envelope

On the left on the **Env F/A** tab, you can set up the filter envelope.



### Attack

Controls the attack time of the filter envelope.

### Decay

Controls the decay time of the filter envelope.

### Sustain

Controls the sustain level of the filter envelope.

### Release

Controls the release time of the filter envelope.

## Amplifier and Amplifier Envelope

On the right of the **Env F/A** tab, you can make settings for the amplifier and the amplifier envelope.



### Amplifier Parameters

#### Level

Controls the overall volume of the sound.

#### Velocity

Controls the level modulation from velocity. At 0, all velocities are played with the same level.

### Amplifier Envelope Parameters

#### Attack

Controls the attack time of the amplifier envelope.

#### Decay

Controls the decay time of the amplifier envelope.

#### Sustain

Controls the sustain level of the amplifier envelope.

#### Release

Controls the release time of the amplifier envelope.

## Arp Page

This page contains the integrated arpeggiator.



### Arpeggiator On/Off

Activates/Deactivates the arpeggiator.

### User Mode On/Off

Activates/Deactivates the user phrase and the user phrase editor.

### Variations

The variation buttons allow you to switch between the available variations.

### Phrase

Allows you to select a phrase.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Mute

Mutes playback. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.
- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the arpeggiator. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.



For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Trigger Mode

Determines the moment when the arpeggiator scans for new notes that you play on the keyboard.

- If **Immediately** is selected, the arpeggiator continuously scans for new notes. The phrase changes immediately, in reaction to your playing.
- If **Next Beat** is selected, the arpeggiator scans for new notes at every new beat. The phrase changes at each new beat, in reaction to your playing.
- If **Next Measure** is selected, the arpeggiator scans for new notes at the start of new measures. The phrase changes on each new measure, in reaction to your playing.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

#### NOTE

The phrase does not restart upon notes that are played legato.

---

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### RstVar (Restart on Variation Change)

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the arpeggiator, even if no new notes or chords are triggered.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

#### NOTE

Not all phrases contain controller data.

---

### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.
- If **As Played** is selected, the notes of the phrase use the velocity of the played note.

- If **Original + As Played** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity of the played note.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

## User Mode Parameters

### Save Phrase/Delete Phrase

The two buttons on the right of the phrase field allow you to save/delete your phrases.

### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.

If **Key Mode** is set to **As Played**, the first and the last note are repeated.

- If **Random** is selected, the notes are arpeggiated in random order.

### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

#### NOTE

**Key Replace** can be set for each individual variation.

---

### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

#### NOTE

Deactivated steps are taken into account.

---

In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

### Groove Quantize

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The arpeggiator scans the keyboard and writes the keys that you press into a note buffer. Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys. **Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each individual step, which allows you to create very elaborate phrases.

#### NOTE

**Key Select** cannot be used if **Arp Mode** is set to **Step** or **Chord**.

---

- To access the **Key Select** values of the steps, click **Show Transpose or Key Select** to the left of the editor, so that a keyboard icon is shown.

- To switch between the available **Key Select** values for a step, click the value, and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up, Down, Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

## Recording the MIDI Output of the Arpeggiator

The phrases that are played by the instrument depend on the played notes and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the arpeggiator.

---

### PROCEDURE

1. Click **Record MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.

2. Play some notes.

3. When you are done, click **Record MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

4. Click the **Drag MIDI** field, and drag the phrase onto a MIDI track in your host sequencer application.
- 

## Creating Variations

You can either start from scratch or base the new variation on an existing variation.

---

### PROCEDURE

- Click one of the variation buttons.
    - To start from scratch, load a phrase, and edit the settings.
    - To use an existing variation as the base, use the **Copy** and **Paste** context menu commands.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop, Sync, Hold, Trigger Mode, Restart Mode, Key Mode, Vel Mode, Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once.

---

## Assigning Variations to Trigger Pads

If you assign the variations to trigger pads, you can use the trigger pads to switch between the variations.

---

### PROCEDURE

1. Right-click a variation button, and select the trigger pad on the **Assign Variation to** submenu.
  2. Repeat this procedure for all the variations that you have created.
- 

## User Phrases

The user phrase has up to 32 steps. Each step has an adjustable **Velocity**, **Gate Length**, and **Transpose** value.

By adding steps, adjusting their length, or leaving pauses, you define the rhythm of the user phrase. Consecutive steps can be combined to create longer notes. By selecting a **Mode**, you define how the notes play back. In addition, there are additional MIDI control sequences, that is, each step can also send modulation signals.

To create your own phrases, activate the **User** button.

## Editing User Phrases

You can make detailed settings for the user phrase in the editor for user phrases.

- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.
- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.



## Editing Steps

The height of a step represents its value. You can edit the steps in the following way:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Alt/Opt - Shift**, and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Ctrl/Cmd - Shift**, and click a step.
- To introduce a legato between two steps, activate **Step Legato** for the first of these steps, so that a small arrow is shown.

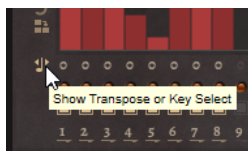
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.

- To transpose a step, click in the **Step Transpose** field, and enter the number of semitones for the transposition.

#### NOTE

You can only transpose steps if **Show Transpose or Key Select** is set to show the transpose values.

---



## Adjusting the Gate Length





For velocity steps, the width of a step represents its gate length.



- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step. You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Ctrl/Cmd - Shift**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as source in the Modulation Matrix, you can modulate any of the destinations with the MIDI controller sequence.

## Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right**  or **Shift Phrase Left** .
- To reverse the phrase, click **Reverse Phrase** .
- To duplicate short phrases, click **Duplicate Phrase** .

#### NOTE

The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated as a whole.

---

# Macro Pages

HALion allows you to build your own sample and synthesizer instruments and to customize them using the integrated Lua script engine. Via the **Macro Page Designer**, you can create your own user interface for these instruments.

The **Macro Page Designer** allows you to create everything from small user interfaces for custom script modules to complete instrument editors with several pages and a wide range of controls, such as knobs, buttons, sliders, text, labels, menus, etc. In addition to the basic controls, complex graphical editors for multi-stage envelopes, the FlexPhraser, the step modulator, and displays for samples and wavetables are available. The controls themselves are highly customizable in how they behave and look.

## NOTE

Macro pages can be created for programs, layers, and Lua script MIDI modules. They are not available for smaller elements, such as zones or effects, for example.

In addition to this documentation, you can find more information on the **Macro Page Designer** under <https://developer.steinberg.help>.

## Macro Pages, Templates, Controls, Resources, and Libraries

The general concept for macro pages distinguishes between templates, controls, resources, and libraries.

### Macro Pages

A macro page is a user interface document that describes which controls and templates are used, how they are graphically arranged, and how the controls are connected to engine or script parameters. The document is saved as an XML file and can be compared to an HTML page describing a web page. A macro page can be created independently from any HALion program and then be combined with it at a later stage. Macro pages contain a list of resources (bitmaps, fonts, etc.) and a list of templates that are referenced on it.

### Templates

A template is a group of controls. A template can be used on a macro page multiple times, each time with different values in the **Properties** section. Templates are organized in the **Templates Tree**. You can create your own templates, either from scratch in the **Templates Tree** or by combining controls that are used on a macro page.

### Controls

A control is a basic element, like a text field, menu, switch, knob, etc., that can be added to a macro page. The behavior and appearance of the controls is specified in the **Properties** section. Some controls can be directly connected to engine and script parameters, others have display functionality and use resources like bitmaps and fonts.

## Resources

Most controls require resources like bitmaps or fonts to display something on the screen. These resources are organized in the **Resources Tree**.

## Libraries

Libraries are identical to macro pages, except that they do not include a functional user interface. Instead, libraries contain a collection of templates and their resources. Using the **Resource/Library Browser**, you can drag templates from a library onto a macro page. This adds an instance of the template, as well as all necessary components, to your macro page. Libraries can be edited in the same way as macro pages. You can export them to exchange them with other users or customers.

## Getting Started

To learn how to build your own macro pages, we recommend to try it out step by step and become familiar with the processes and options.

Once you have the general idea of how macro pages are created, take a look at the HALion instruments – Anima or Skylab, for example. These instruments are built using the feature set and editors of the **Macro Page Designer**, and you can see every single element on the GUI and check out how it is structured and connected to the engine or scripts.

## Preparing a Basic Macro Page

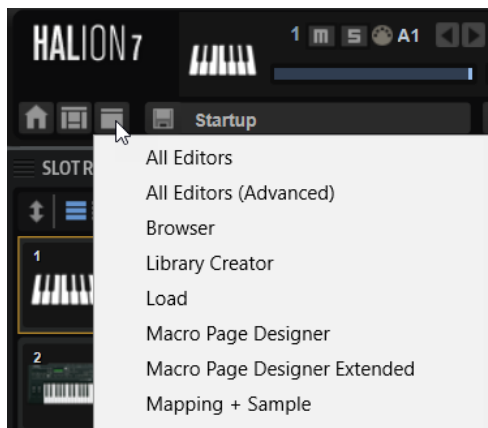
### PREREQUISITE

You have created a program with a single synth zone.

---

### PROCEDURE

1. Click **Open/Save/Delete Window**, and select **Macro Page Designer Extended**.



This window combines the **Macro Page Designer** with the **Program Tree**, the **Parameter List**, the **Sound Editor**, and the **Macro Page**. Those editors can be used in combination to set up and test a macro page.

2. Select the program in the **Program Tree**.
  3. On the toolbar of the **Macro Page Designer**, click **Create New Macro Page**, and select **Create HALion Sonic Macro Page** to create a page that corresponds to the standard size used in HALion Sonic.
-



#### RESULT

This creates an empty macro page with a size of 595 x 390 pixels. **Size Lock** is automatically activated to prevent you from accidentally changing the size of the macro page. The **Macro Page Designer** shows all the editors that are necessary to build a macro page.

#### NOTE

You can also create larger macro pages. HALion Sonic automatically adapts the size to the size of the macro page.

---

## Adding a Background Image to a Macro Page

To design your macro page, the first step is to add a background image.

#### PREREQUISITE

- You have prepared a basic macro page in the **Macro Page Designer**.
- You have created or selected a bitmap file that you want to use as a background.

---

#### PROCEDURE

1. In the File Explorer/macOS Finder or the **Resource/Library Browser**, navigate to the .bmp or .png bitmap file, and drag it onto the canvas of the **Macro Page Editor**.  
A new image control is added to the **GUI Tree**, and the bitmap resource is added to the **Resources Tree**. This resource is used by the image control on your page.
2. Optional: Adjust the position or size of the image, either in the **Properties** section or on the canvas.

---

#### RELATED LINKS

[Editing the Elements on the Canvas](#) on page 526

[Scaling Elements](#) on page 529

## Loading a Template and Connecting It to the Parameters of Your Program

Once you have created a macro page, you can connect the parameters of your program to the macro page controls.

---

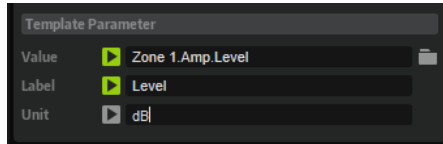
#### PROCEDURE

1. In the **Resource/Library Browser**, select the **Basic Controls** library.
2. Select the **Knobs** folder.
3. Make sure that the **GUI Tree** has the focus and drag the **Knob H6** template from the browser onto the macro page.  
The knob is added to the macro page. The template already contains several control elements like the knob itself, a text field, and a label.
4. To move the template, drag it to another position. To scale the template, drag its edges.  
In this example, the template adapts the size of the text field and label accordingly and keeps the knob centered.
5. In the **Program Tree**, select the zone that you want to use.

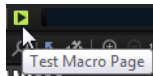
6. In the **Parameter List**, scroll to the **Amp** folder, expand it, and drag the **Level** parameter name onto the **Value** field in the **Properties** section for the knob template or onto the knob on the canvas.

The level of the zone is now connected to the value field.

7. Enter the name for the knob in the **Label** field, for example, **Level**.



8. Set **Unit** to **dB** to show a value in decibel.
9. For the tooltip, enter **Oscillator Level**.
10. Now that the connection is established, activate **Test Macro Page** and use the knob.



In the **Parameter List** and/or the **Amp** section of the **Zone Editor**, you can see that the parameter values change as you use the control.

---

## Defining the Appearance of the Macro Page in the Player View

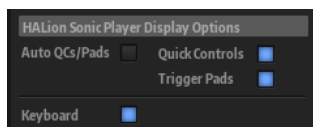
The plug-in window of HALion Sonic can switch between two views: the full-size editor view and the smaller, configurable player view. When creating your macro pages, you can specify the elements that are shown/hidden in the player view.

### PREREQUISITE

- You have created a macro page.
- You have selected the macro page in the **GUI Tree** so that the **Properties** section shows the **HALion Sonic Player Display Options** section.

### PROCEDURE

1. In the **HALion Sonic Player Display Options** section, specify the elements that you want to show in the player view.



- If **Auto QCs/Pads** is activated, the quick controls and trigger pads sections are shown in the player view for presets that use quick controls and/or trigger pads.  
If **Auto QCs/Pads** is deactivated, you can choose for each of the elements separately whether you want to add them to the player view.

### NOTE

The sections are only shown for presets that use quick controls and/or trigger pads. Otherwise, they are hidden.

- If **Keyboard** is activated, the keyboard section is shown in the player view.
2. Save the macro page.
-

RESULT

If you now open your macro page in HALion Sonic and switch to the player view, the elements that you specified here are shown.

NOTE

You can manually modify the appearance of the player view in HALion Sonic.

---

## Saving the Macro Page

To save your macro page, click **Save Macro Page/Library**, specify a name and a location, and click **Save**.

NOTE

Macro pages can be created for programs, layers, and Lua script MIDI modules. They are not available for smaller elements, such as effects or zones, for example.

---

# Macro Page Designer

The **Macro Page Designer** is where you create and edit macro pages.



In the middle of the editor, you find the canvas, that is, the area where you arrange the controls on your interface.

The section on the left can show either the **GUI Tree**, the **Templates Tree**, or the **Resources Tree**. These give you access to the macro page and its components.

The **Properties** section in the lower left shows the properties of the selected control, template, or resource.

Below the canvas, you can display the **Resource/Library Browser** that can be used to browse for control templates in libraries or in existing macro pages or for bitmap resources on your system.

## Toolbar

The toolbar provides tools and commands for designing and managing your macro pages.



### Create New Macro Page/Library



What happens when you click this button depends on which element is selected in the **Program Tree**.

If a program or layer is selected, you can choose between **Create Macro Page** and **Create HALion Sonic Macro Page**.

- **Create Macro Page** allows you to create a macro page that does not have any limitation in size.

NOTE

With this option, it is possible to create macro pages that cannot be fully displayed in HALion Sonic or in the default screen setup of HALion, for example.

- **Create HALion Sonic Macro Page** creates a macro page that corresponds to the standard size used in HALion Sonic, that is, 595x390 pixels. If you select this option, **Size Lock** is automatically activated so that you cannot accidentally modify the size of the macro page during the design process of the page.

If a Lua script MIDI Module is selected, a macro page is created that corresponds to the standard size used in HALion's MIDI modules. **Size Lock** is automatically activated so that you cannot accidentally modify the size of the macro page during the design process of the page.

#### Load Macro Page



Allows you to navigate to a macro page and load it.

#### Save Macro Page/Library



Saves the current state of your macro page.

#### Export Macro Page/Library



Allows you to export the macro page, including all required resources, such as bitmaps, fonts, and scripts. You can use **Export Macro Page/Library** to consolidate and relocate all resources for a macro page and to save them under the names defined on the macro page.

NOTE

The program, layer, or Lua script MIDI module from which you exported the macro page still uses the original version of the macro page. To use the exported macro page instead, load it via the **Load Macro Page** button on the toolbar.

#### Revert to Last Saved Macro Page/Library



Reloads the macro page as it was saved the last time. Any unsaved changes are discarded.

#### Remove Macro Page

Deletes the active macro page.

#### Cut

Cuts the selected element.

#### Copy

Copies the selected element to the clipboard.

## Paste

Pastes the element from the clipboard to the current position.

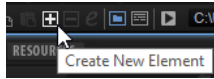
### NOTE

You can copy and paste elements between macro pages. All related resources are automatically copied as well.

---

## Create New Element

Adds a new element.



Which elements can be added depends on whether you are in the **GUI Tree**, the **Templates Tree**, or the **Resources Tree**.

## Delete Element

Deletes the selected element.

## Edit Element



Allows you to edit the selected element.

## Show Properties as Column



Displays the **Properties** panel as an additional column. This includes the **Preview** and **Description** panels that are displayed below the **Properties** panel.

## Show/Hide Resource/Library Browser



Shows/Hides the **Resource/Library Browser** below the canvas.

## Show/Hide Debug Messages



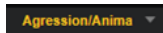
Shows/Hides the **Debug Messages** section below the **Resource/Library Browser**.

## Test Macro Page



Activates test mode. This allows you to simulate using the macro page controls on the macro page in its final state.

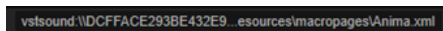
## Path to Object



Shows the layer or Lua module to which the macro page is attached.

If multiple layers or Lua modules within a program use a macro page, this option can help you to identify the macro page that is being edited. Furthermore, you can verify that a macro page is connected to the correct layer, or that it is not connected to more than one layer, for example.

## Path to Macro Page File



Shows the path to the folder in which the current macro page is located.

## Undo Last Command/Redo Last Command



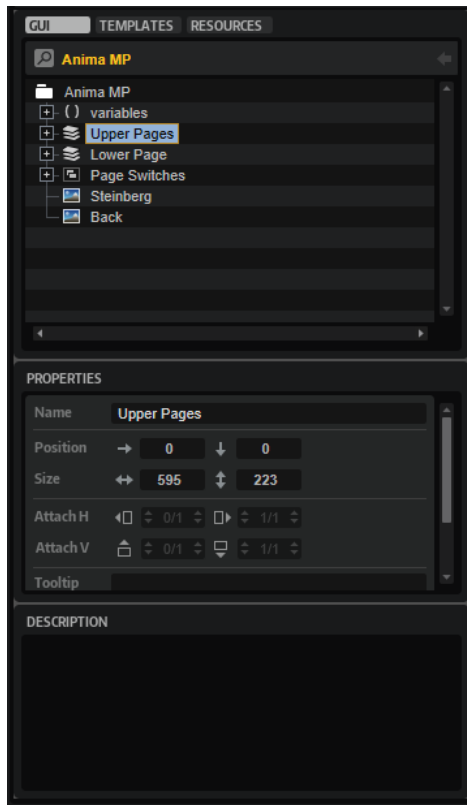
Allow you to undo/redo your actions.

The undo history of the **Macro Page Designer** is independent from HALion's global undo history. As a result, parameter changes or modifications of the program structure, such as adding or removing modules, etc., do not interfere with the changes that you made on the macro page.

## GUI Tree

The **GUI Tree** shows the hierarchical structure of a macro page with all its controls and templates. You can set up and structure the macro page by adding and removing elements, grouping them, etc.

If you select an element in the **GUI Tree**, the element is highlighted on the canvas.



The **Properties** section allows you to make adjustments to the selected element.

The **Description** section allows you to add explanatory text or comments for every control or template that is used on the macro page.

### Switch Back to Macro Page/Parent Template



This button in the header of the **GUI Tree** allows you to go back to the last macro page, template, etc. For example, after editing a template within a template, clicking **Switch Back to Macro Page/Parent Template** takes you back to the parent template.

## Context Menu

Edit	Ctrl+E
Cut	Ctrl+X
Paste	Ctrl+V
Delete	Del
Duplicate	Ctrl+D
Copy	Ctrl+C
Reload Resources	
<hr/>	
Create	>
Create from Selection	>
<hr/>	
Expand Tree	
Collapse Tree	

### Edit

Allows you to edit the selected element.

### Cut

Cuts the selected element.

### Paste

Pastes the element from the clipboard to the current position.

### Delete

Deletes the selected element.

### Duplicate

Duplicates the selected element.

### Copy

Copies the selected element to the clipboard.

### Reload All Resources

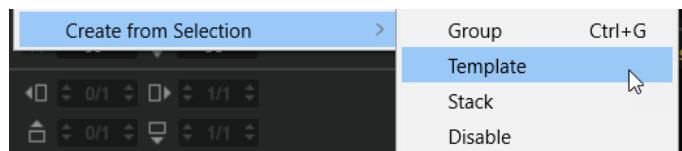
Allows you to reload all resources. This can be necessary if you changed a bitmap resource in an external image application, for example, and you want to see the updated image on the macro page. Without reloading the resources, your changes take effect when you load the program the next time.

### Create

Opens a submenu containing the elements that can be added. Select a menu entry to add the element to the **GUI Tree**.

### Create from Selection

Allows you to edit the selected elements in the following way:



- **Group** creates a group that contains the selected elements.
- **Template** creates a template from the selected elements, selects the template, and activates it for editing.
- **Stack** creates a stack that contains the selected elements.
- **Disable** creates a disable view of the selected elements.



### Expand Tree/Collapse Tree

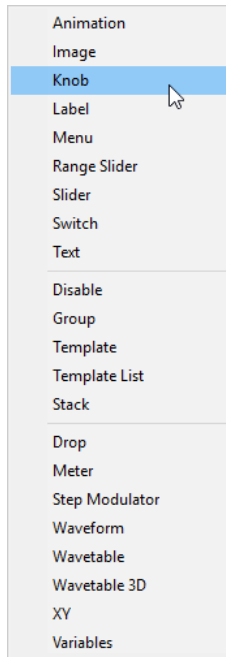
These commands expand/collapse the entire tree or one of its substructures, depending on where you click to open the context menu.

#### RELATED LINKS

[GUI Tree Elements](#) on page 507

## GUI Tree Elements

You can add the components that are used on the macro page via the **Create New Element** button on the toolbar.



### Animation

Allows you to display animations or graphical option menus on your macro page.

### Image

Allows you to add bitmaps in the formats .png and .bmp.

### Knob

Allows you to create potentiometers by using a bitmap or a section with frames. These frames will be played as an animation when turning the knob.

### Label

Allows you to display text for knobs, text fields, or sections. This text is defined once and cannot be edited on the macro page. To insert editable text, use the **Text** element instead.

You can either use one of the available system fonts or use your own fonts for more decorative text styles.

### Menu

Allows you to create switches that open a menu. This menu is filled with the values that are delivered by the connected parameter. The menu also provides an option to open a tree menu, which is helpful when the element contains a large number of values.

### **Range Slider**

Allows you to add a range slider. This is similar to the **Slider** element, but it is used to work on a specific range that is defined by minimum and maximum values.

### **Slider**

Allows you to create a variety of different slider types. You can choose between horizontal and vertical sliders, let the slider jump or move to the click position, etc. Sliders can use a background bitmap that can also be an animation.

### **Switch**

Allows you to create different types of switches. By specifying a **Mode**, you can configure the switch as an on/off switch with two states, as a multi-state switch with an arbitrary number of states, you can create exclusive switches that can act as a radio group, etc. The switch requires several bitmaps, depending on the set **Mode** and can be set to **Scalable**, which allows you to resize the switch. In this case, the bitmaps are resized according to the set **Scale Mode**.

### **Text**

Allows you to add editable text to your macro page.

### **Disable**

Allows you to add a special group that can disable all its child controls.

### **Group**

Allows you to add a group that serves as a container for controls and templates.

### **Template**

Allows you to add an instance of a template to the **GUI Tree**.

### **Template List**

Allows you to add a list that can contain multiple instances of a referenced template.

### **Stack**

A stack allows you to create pages or sections on a macro page between which you can switch. Each child of a stack is shown exclusively, depending on the value of the stack. For example, you can control stacks using radio switches, by providing one switch per stack view.

### **Drop**

Allows you to add a control that accepts dropped objects and returns information such as the file name and path of a sample file, for example.

### **Meter**

Allows you to add meters that can display the value of a parameter.

#### **NOTE**

For audio metering, use the "Bus Meter" template instead.

---

### **Step Modulator**

Allows you to add a control with up to 32 editable bars.

### **Waveform**

Allows you to add a waveform display to show sample waveforms.

### **Wavetable**

Allows you to add a display showing the waveform output of a wavetable oscillator.

### Wavetable 3D

Allows you to add a display that shows a wavetable as a three-dimensional image.

### XY

Allows you to add a two-dimensional control, where the position of a point in a field controls two parameters.

### Variables

Allows you to add a folder in which you can add variables.

If a **Variables** folder was added, you can select the available variables from the **Variables** submenu.

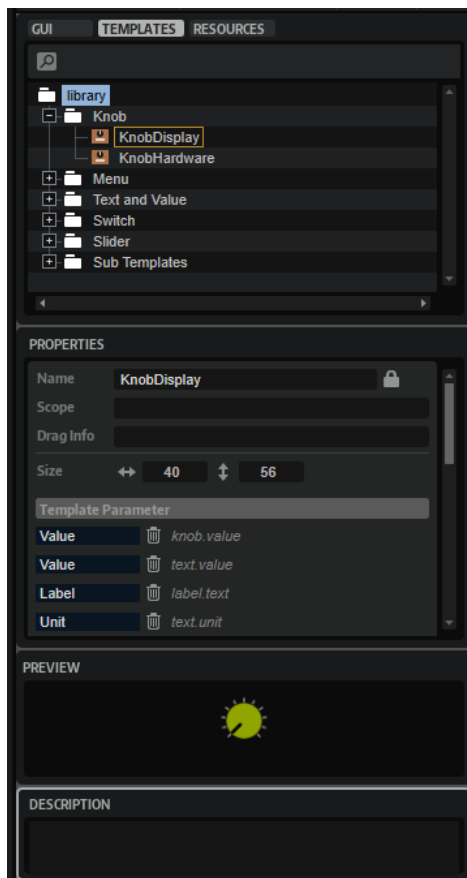
## Managing the GUI Tree Elements

The structure of the **GUI Tree** has an influence on the order in which overlapping elements are layered on the canvas. Elements that are children of another element are drawn on top of their parent. Elements that are on the same hierarchy level are drawn bottom to top, that is, the highest element in the tree is drawn topmost on the canvas.

- To move an element, drag it to another position.  
If you drag an element on a group, it is added as a child to this group.
- To group several selected elements, open the context menu and select **Group Selected Elements**.

## Templates Tree

The **Templates Tree** allows you to organize your templates.



You can add **Template** or **Template Folder** elements to the **Templates Tree** using the **Create New Element** button on the toolbar. This allows you to structure the template content of your macro page.

#### NOTE

Templates with an attached Lua script are indicated by a green template icon.

---

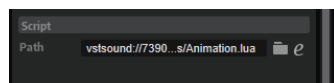


#### Properties

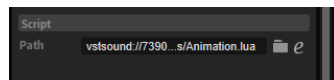
The **Properties** section allows you to make adjustments for the selected element.

The template properties show all template and Lua script parameters.

- If an internal or external script is used, you can open the script for editing with the **Edit Script** button on the right.



- If no script is used in a template, the **Create Script** button allows you to create a script for the template.



#### Preview

The **Preview** section displays the contents of the selected template.

#### Description

The **Description** section allows you to add explanatory text or comments to individual templates. This text is shown in the **Properties** section of the **GUI Tree** when you select a template that is referenced on a macro page.

## Editing Templates

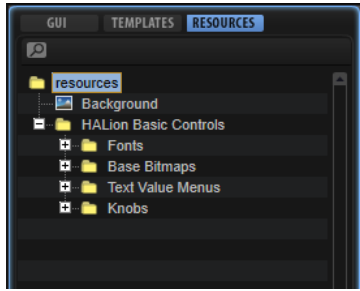
---

#### PROCEDURE

1. In the **Templates Tree**, select the template, and click **Edit Element** on the toolbar. The **GUI Tree** opens and shows the template structure. The canvas displays the content of the template.
  2. Now, you can enter values manually in the **Properties** section, drag elements from the **Resource/Library Browser**, arrange them on the canvas, etc.
  3. When you are done, click **Switch Back to Macro Page/Parent Template** on the toolbar to return to the macro page.
-

## Resources Tree

The **Resources Tree** shows the resources that are available within a macro page.



You can add or remove resources in the tree and organize them into folders. This allows you to structure your macro page, in order to keep an overview over your files.

### NOTE

The **Resources Tree** shows all resources that were added to the macro page. The number of resources in the tree can differ greatly from the number of resources that are actually used. Therefore, it is good practice to remove any unused resources before finalizing your macro page.

Resources can be added to the tree via the toolbar, the context menu, or by dragging them onto the canvas. For a better overview, the different element types use different icons. If a resource is selected, the canvas switches to the **Resource Editor**, displaying the referenced bitmap, section, font, etc.

### NOTE

Only files of the supported file formats can be imported as resources.

### RELATED LINKS

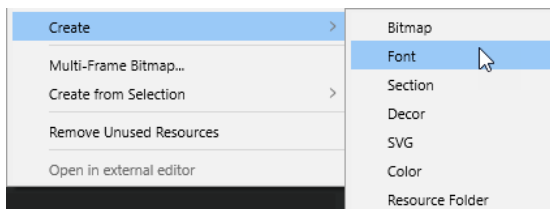
[Removing Unused Files](#) on page 540

## Resources Tree Elements

In the **Resources Tree**, you can add and edit the resources for your macro pages, that is, bitmaps, sections, fonts, etc.

### NOTE

To name resources, do not use the following characters: \@:.\|=}. If you import a bitmap whose file name contains one of these characters, it is automatically replaced by an underscore.



### Bitmap

HALion supports 24-bit .bmp files and 24-bit .png files with alpha channel. A bitmap can either be a single image or consist of a series of subframes. The **Properties** for a bitmap resource include the path information to the original bitmap file and the

number of frames that the bitmap consists of. For single images, the frame count is 1. If the bitmap contains an animation, such as for a knob, for example, you must set the number of frames.

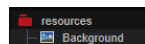
When you add a bitmap, HALion analyzes it to find out if the image is in fact an animation and to determine the number of frames. The number of frames is then set automatically. However, this analysis cannot always deliver the perfect frame count, so in some cases, we recommend to set this value manually.

Bitmap resources also provide an alpha channel that allows you to specify the overall transparency of the bitmap. A setting of 255 corresponds to a fully opaque bitmap. A value of 128 results in a semi-transparent background, for example.

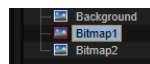
As of version 6.2 of HALion/version 3.2 of HALion Sonic, macro pages support **High DPI**, that is, the adaptation of the macro page to higher scaling factors on high-resolution displays. For this, additional bitmap resources are required. These bitmaps must be saved in the same folder as the standard resolution bitmap. The following naming scheme applies: for double-resolution files, add “\_2.00x” to the end of the file name, for triple-resolution files, add “\_3.00x”, etc.

If you add a **High DPI** version for a bitmap resource, HALion informs you if bitmap resources without **High DPI** versions exist, to ensure that a macro page can be built with full **High DPI** support. The warnings are shown in the following places:

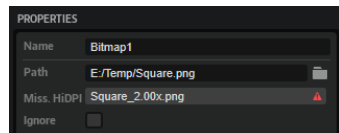
- The corresponding resources folder in the **Resources Tree** turns red.



- The bitmap icon in the **GUI Tree** is highlighted by a red frame.



- In the **Properties** section for the bitmap, the info line shows a warning icon in conjunction with the name of the expected file.



#### NOTE

You can deactivate warnings about missing **High DPI** bitmaps by activating **Ignore Missing HiDPI Bitmaps**.

HALion and HALion Sonic display the bitmap that best matches the scaling factor as set in the operating system. For example, if the display scaling is set to 200% on a Windows system, HALion uses the “\_2.00x” bitmaps for the macro page. When you create VST Sound containers, the **Library Creator** automatically includes all additional high-resolution bitmaps.

#### NOTE

You can open bitmap and SVG resources in an external editor using the **Edit** command. The **Option Editor** allows you to specify the external editor.

## Font

Allows you to define a font for use in your macro page elements. You can make settings for it in the **Properties** section.

#### NOTE

Only use free fonts or fonts whose licenses you own.

---

### Section

A section is a rectangular region within a bitmap. In the **Properties** section, you can specify the reference bitmap and the coordinates of the section rectangle. This allows you to create multiple images in a single bitmap and then define the necessary sections, all referring to that same bitmap. This way, you can reduce the number of bitmap files that are managed by the operating system.

A section can also contain multiple frames of an animation. You can specify the number of frames with the **Frames** parameter.

### Decor

A decor is a definable rectangle. It can have rounded corners, a fill color and a line style, and it can be used in all places that accept bitmap resources. A decor can have a fixed size, but it can also be configured as **scalable**, which means that it is scaled together with the control in which it is used. This allows you to create simple graphical switch states that do not need any predefined bitmaps, for example. A decor is an object created by an algorithm, which is why it is automatically displayed correctly on HiDPI monitors.

### SVG

Allows you to add an SVG resource. All controls that use bitmap resources accept SVG resources. These can be used as simple images, just like PNG or BMP files, but with the great advantage that they are vector-based. This means that they are automatically scaled when working with display scaling factors other than 100%. Furthermore, when scaling a control using the **scalable** option, the image scales seamlessly and without blurring.

SVG files can be modified within HALion, allowing you to transform one SVG file into a variety of different SVG resources.



#### NOTE

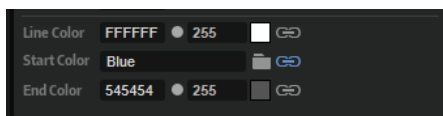
You can open bitmap and SVG resources in an external editor using the **Edit** command. The **Option Editor** allows you to specify the external editor.

---

### Color

In color resources, you can specify RGB and alpha channel values. You can use color resources wherever you can define a color for a control as an RGB value.

To use a color resource in the color property of a control, activate **Use Color Resource**  next to the color preview square. Click **Select File**  to select a color resource, or enter the name of the resource in the text field.



#### NOTE

Color resources can be used in font and decor resources.

---

### Resource Folder

You can add folders to the **Resources Tree** to help you structure your macro page and keep an overview of the resources.

#### RELATED LINKS

[Edit Section](#) on page 44

[Creating SVG Resources](#) on page 514

[Modifying SVG Resources](#) on page 514

## Creating SVG Resources

You can create SVG resources by adding SVG files to the **Resources Tree**.

---

#### PROCEDURE

1. Right-click the **Resources Tree**, and select **Create > SVG**.
2. In the **Path** row, click **Select File** to open a file dialog, select the file that you want to use, and click **Open**.

Alternatively, you can drag and drop SVG files from your file browser onto the **Path** row.

---

## Modifying SVG Resources

Any object contained in an SVG resource can be modified.

#### PREREQUISITE

The object must be identifiable by a unique ID.

---

#### PROCEDURE

1. Enter the ID of the object in the **ID** text field, to specify the object that you want to modify.
2. Set the property of the object that you want to change in the **Property** text field. For example, enter `fill` to change the color.
3. Specify the value in the **Value** text field.

For colors, you can either enter the name, such as "blue" or "red", for example, or RGB values, such as "rgb(255,255,255)". If you have defined color resources, you can assign them by using the following format: `$cr(color name)`.

Once a property is added, a new empty **Property** line becomes available, which allows you to modify further properties of the object. For example, you can change the color, the width of the stroke, etc.

---



## Resources Tree Context Menu

Cut	Ctrl+X
Edit	Ctrl+E
Copy	Ctrl+C
Paste	Ctrl+V
Delete	Del
Duplicate	Ctrl+D
Create	>
Multi-Frame Bitmap...	
Create from Selection	>
Remove Unused Resources	
Expand Tree	
Collapse Tree	

### Cut

Cuts the selected element.

### Edit

Allows you to edit the selected element.

### Copy

Copies the selected element to the clipboard.

### Paste

Pastes the element from the clipboard to the current position.

### Delete

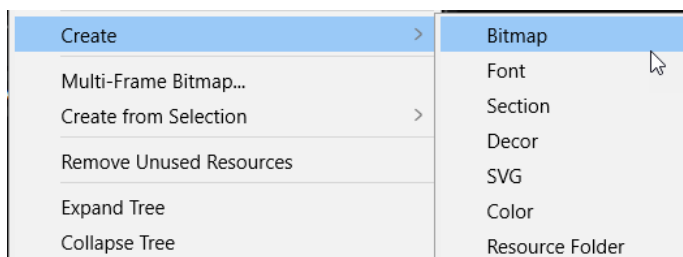
Deletes the selected element.

### Duplicate

Duplicates the selected element.

### Create

Opens a submenu containing the elements that can be added. Select a menu entry to add the element to the **Resources Tree**.



### Multi-Frame Bitmap

Allows you to import a multi-frame bitmap.

### Create from Selection

Allows you to create a group that contains the selected elements.

### Remove Unused Resources

Removes all unused resources from the **Resources Tree**. Before finalizing your macro page, it is good practice to use this command, to clean up and to reduce the size of your macro page.

### Open in External Editor

Opens the selected SVG file in an external editor. You can specify the external editor in the **Edit** section of the **Options Editor**.

### Export SVG

Allows you to export an SVG file that references a VST Sound container to a local folder in your system. This way, you can modify the SVG file and use it on other macro pages.

#### RELATED LINKS

[Resources Tree Elements](#) on page 511

[GUI Tree Elements](#) on page 507

[Importing a Multi-Frame Bitmap](#) on page 516

[Edit Section](#) on page 44

## Importing a Multi-Frame Bitmap

When you use animated controls like knobs or switches, the original creation tool is often a 3-D program that generates video files or a series of single frames of the final control animation. However, HALion requires single-frame bitmaps. Once you have generated all the required frames, they must be combined into a single image, where all frames are pasted vertically from top to bottom.

---

#### PROCEDURE

1. In the **Resources Tree**, open the context menu and select **Multi-Frame Bitmap**.
2. Navigate to the folder where the animation frame bitmaps are located.
3. Select all the required bitmap files and click **Open**.
4. Navigate to the folder where you want to save the bitmap and click **Save**.  
A .png file that contains all the selected frames is created and the frame count is set to the corresponding value.

---

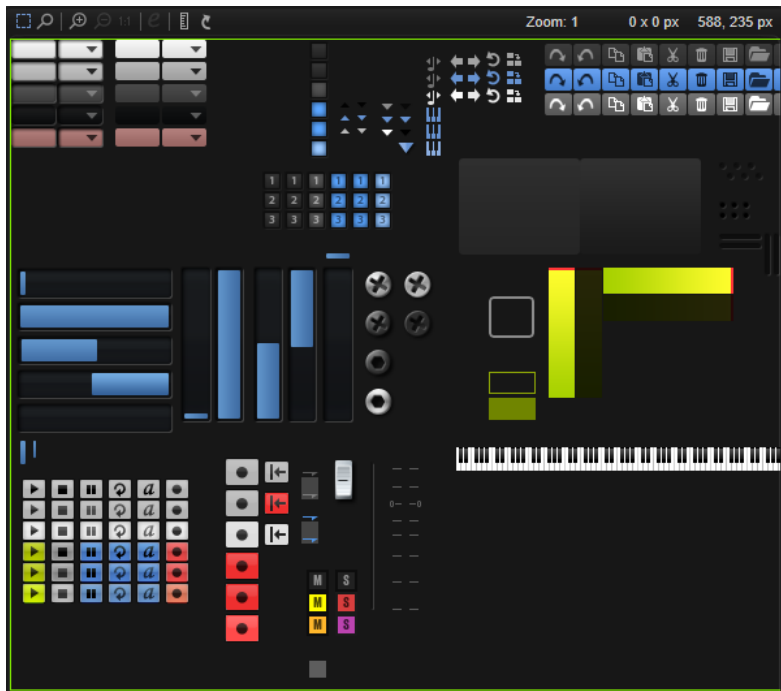
#### RESULT

You can now use the new bitmap file just as any other bitmap resource.

## Resource Editor

If the **Resources Tree** is selected, the canvas shows the **Resource Editor**.

The **Resource Editor** shows the selected bitmap, section, or a preview of the selected font. It allows you to create new sections from bitmaps or to modify existing sections.



## Toolbar

### Select Tool

Activate this tool if you want to define sections from a bitmap.

### Zoom Tool

This tool allows you to define sections more precisely.

If **Zoom mode** is activated, you can zoom in on a specific area by clicking it. Each click zooms in deeper. **Shift**-click to zoom out.

### Zoom In

Zooms in one step.

### Zoom Out

Zooms out one step.

### Zoom to Actual Pixels

Displays the bitmap in its original size.

### Edit Section

This button is only available for sections. Click it to switch between showing the section and showing the underlying bitmap that contains the selection rectangle defining the section.

If this button is activated, you can modify the section rectangle. To update the section, deactivate the button again.

### Show Ruler

Shows/Hides the horizontal and vertical rulers.

### Reload All Resources

Allows you to reload all resources. This can be necessary if you changed a bitmap resource in an external image application, for example, and you want to see the updated image on the macro page. Without reloading the resources, your changes take effect when you load the program the next time.

### Zoom Factor

Indicates the current zoom factor.

### Selection Size

Indicates the size of the current selection.

### Mouse Position

Indicates the current mouse position.

## Sections

You can combine your bitmaps into a single larger bitmap and then create sections within this bitmap for all the images that you want to use. This helps you keep a better overview over the macro page bitmap resources, for example.

### Creating a Section From a Bitmap

---

#### PROCEDURE

1. Add a bitmap resource that contains all the regions that you want to address.
  2. Open the **Resources Tree** context menu and select **Create > Section**.
  3. Enter the name for the new section.
  4. In the **Properties** section, click **Select File** next to the **Bitmap** field and select the bitmap.
  5. Use the **Position** and **Size** controls to specify the borders of the new section within the bitmap.
- 

### Creating a Section From a Selection

---

#### PROCEDURE

1. Zoom in on the area where you want to create the section.
  2. With the **Select Tool**, draw a rectangle around the region that represents the section.
  3. If necessary, adjust the selection edges by dragging the borders.
  4. Open the context menu and select **Create Section from Selection**.
- 

#### RESULT

The section is added to the tree and the editor automatically switches to the new section resource. You can now use the new section in any control that requires a bitmap resource.

### Creating a Section From another Section

---

Using existing sections to create new sections is particularly useful if you want to create several sections of the same size.

#### PROCEDURE

1. Select the section in the tree.
2. Activate **Edit Section** to display the source bitmap that contains the section rectangle.
3. Right-click the canvas and select **Create Section from Selection**.

The section is added to the tree and the editor automatically switches to the new section resource.

4. Move the rectangle so that it encompasses the region that you want to use in the new section.
  5. Optional: Repeat steps 3 and 4 to create all the necessary sections.
  6. Deactivate **Edit Section**.
- 

## Modifying a Section

If a section is not quite accurate or does not contain the content that you wanted it to show, you can modify it.

---

### PROCEDURE

1. Select the section in the tree.
  2. Activate **Edit Section** to display the source bitmap that contains the section rectangle.
  3. Adjust the section rectangle by dragging its edges.
  4. Deactivate **Edit Section**.
- 

## Properties Section

The **Properties** section allows you to edit the properties of the selected element.

For example, if you select a resource in the **Resources Tree**, the **Properties** section allows you to make settings for this specific resource.

Which parameters are available in this section depends on the selected element.

## Canvas

The canvas allows you to edit your macro page graphically by adding and arranging elements, etc., and to create and edit the used templates and resources. Depending on which tree and element is selected, the canvas shows the macro page as it will appear in the **Macro Editor**, the content of the selected template, or the resource editor.



You can drop controls, templates, and resources directly onto the canvas to add them to your macro page.

## Toolbar

The canvas toolbar is available for the **GUI Tree** and the **Templates Tree**. The **Resource Editor** has its own toolbar.

### Move Tool

If this tool is selected, you can move and resize controls on the canvas.

### Zoom Tool

If this tool is selected, you can zoom in on a specific area by clicking in the center of it. Click multiple times to increase the zoom level.

### Focus Mode

Allows you to select elements on the canvas by clicking them. If **Focus Mode** is deactivated, you can only set the focus on the canvas by selecting an element in the **GUI Tree**.

If an element is selected, you can move and scale it on the canvas.

### Disable Attachments

Allows you to deactivate any attachments for all objects on the canvas.

For example, if **Disable Attachments** is activated, changing the position of a group edge changes the size of the group only, any attached child objects are not resized or moved.

### Zoom In

Zooms in on the macro page.

#### NOTE

If the macro page is zoomed in, you cannot use test mode. To test the functionality of your macro page, you must zoom back to the original resolution.

---

### Zoom Out

Click this button to zoom out.

### Zoom to Actual Pixels

Displays the macro page in its original size.

### Enable Grid

Activating the grid allows you to place controls and other elements on a fixed grid.

#### NOTE

If you move an element using a key command, the grid is not used and the element can be placed freely.

---

### Grid Width

Sets the width of the grid, in pixels.

### Enable Coarse Step

If **Enable Coarse Step** is activated, you can position elements on the canvas grid using a larger step width.

### Coarse Step Width

Sets the coarse step width, in pixels.

**Show Pixel Grid**

Shows a grid that represents the actual pixels. This grid is only displayed for high zoom levels, starting with 600 %.

**Show Guide Lines**

Activate this option to show/hide guide lines on the canvas. If **Show Guide Lines** is activated, objects snap to these lines when approaching them.

**Show Ruler**

Shows/Hides the horizontal and vertical rulers. The rulers show coordinates in pixels.

**Reload All Resources**

Allows you to reload all resources. This can be necessary if you changed a bitmap resource in an external image application, for example, and you want to see the updated image on the macro page. Without reloading the resources, your changes take effect when you load the program the next time.

**Zoom Factor**

Indicates the current zoom factor.

**Mouse Position**

Indicates the current mouse position.

## Editing and Assembling Elements

For your macro pages, you will use many elements that need to be placed on the canvas in a specific order, have a specific color and size, etc. You have many possibilities for adding, editing, scaling, and arranging the available elements on the canvas.

## Templates

You can create and arrange controls directly on the canvas and then connect them to HALion parameters. This is a very straightforward way of creating a macro page. However, with this workflow, once the page is set up, it becomes very difficult to change the look of some controls globally, because you have to edit every single instance of these controls on the page. Therefore, it is often better practice to work with templates.

Templates allow you to combine several controls with a specific look and feel in a single unit that can be used several times on a macro page and that can be connected to different parameters.

If you use templates and a modification is necessary, you only have to change the template to apply the changes to all controls that use the template.

Furthermore, templates can be saved in libraries, which means that you can build your own control template library and use controls from there in your projects.

Using templates is a very powerful way to create sophisticated interfaces that still allow for quick changes of the overall look, simply by modifying a few parameters.

There is no hard and fast rule when it comes to deciding when to create a template and when to use the controls directly on the macro page, but for big projects or projects that are similar in style and/or share a lot of their content, creating templates can save a lot of time and keep a lot of flexibility until a very late stage in your work.

## Creating Templates

You can create a template from scratch by adding a new empty template to the **Templates Tree** and then assembling and configuring its elements. In addition, you must specify which

control values you want to export to the template. Exported **Properties** values become template parameters and can then be connected to HALion engine parameters.

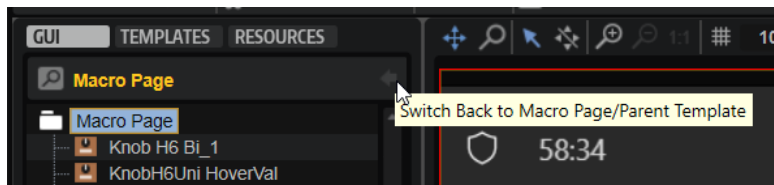
#### PREREQUISITE

You have created or loaded a macro page in the **Macro Page Designer**.

---

#### PROCEDURE

1. Right-click the **Templates Tree** and select **Create > Template**.  
This creates a new empty template.
2. Enter a name for the template and click **Edit Element** on the toolbar.
3. Specify the size for the template by dragging the borders of the rectangle on the canvas.
4. Right-click the **GUI Tree** and select **Create > Knob**.
5. In the **Properties** section for the knob element, assign a bitmap to it by dragging it from the **Resource/Library Browser** onto the **Bitmap** field.
6. Right-click the **GUI Tree** and select **Create > Text**.
7. Right-click the **Resources Tree** and select **Create > Font**.
8. Set up the font in the **Properties** section.
9. In the **Properties** section for the **Text** element, select the font that you have set up.
10. Arrange the knob and the text controls on the canvas.
11. Select the knob control and activate the **Export Property** button for the **Value** parameter.
12. Do the same for the text control.
13. In the **Properties** section for the template, enter the same name for the two created template parameters, for example **Value**. This way, they appear as a single template parameter when you use the template on the macro page.
14. When you are done setting up your template, click **Switch Back to Macro Page/Parent Template** in the top right corner of the **GUI Tree**.



#### RESULT

You can now use your template on the macro page.

## Creating Templates From Groups or Selections

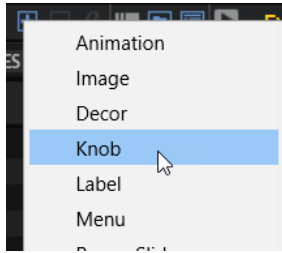
In the **GUI Tree**, you can create templates from a group or a selection. This is useful if you want to use this specific combination of elements as one entity on your macro pages.

---

#### PROCEDURE

1. In the **GUI Tree** toolbar, click **Create New Element** and add a **Text** and a **Knob** element.





2. Select the knob element, and specify its bitmap in the **Bitmap** field in the **Properties** section.
3. In the **Resources Tree**, create a **Font** element and make settings for the font in the **Properties** section.
4. In the **GUI Tree**, select the text element, and select the created font in the **Font** field in the **Properties** section.
5. Arrange the text and knob elements graphically on the canvas.
6. In the **GUI Tree**, select the text and knob elements, open the context menu, and select **Create Template <template name> from Selection**.
7. As template name, enter **Knob\_with\_Text**.
8. Select the knob element and activate the **Export Property** button for the **Value** parameter.
9. Do the same for the text element.
10. Select the template **Knob\_with\_Text** in the **GUI Tree**.  
The **Properties** section now contains a **Template Parameter** section where the two **Value** parameters are listed.
11. Enter the same name for both **Value** parameters.
12. When you are done setting up your template, click **Switch Back to Macro Page/Parent Template** in the top right corner of the **GUI Tree**.

---

#### RESULT

When you use the template, it will show both controls in a single connection. They appear as a combined template parameter on the parent. You can now connect the template and both the **Text** and **Knob** values will react to parameter changes in HALion.

#### NOTE

You can add default values for exported parameters by typing in a string or a value, even though the **Export Property** button is activated. As long as this string or value is not overwritten in the template instance, it remains active.

For an example, look at the exported label parameters of the library controls. You will see that they are all set to **Label**. This means that when you add such a template to your macro page, the control will show this default label. Setting the **Label** parameter of the template will overwrite the default value and show the new name instead.

---

#### AFTER COMPLETING THIS TASK

You can now name the template and finalize it by exporting the required parameters, adding additional components, or setting up attachments, for example.

## Creating Nested Templates

You can create templates that contain other templates. Combining templates this way allows you to specify separately for each child template whether you want to use its parameter values in the parent template or whether you want to use fixed parameter values.

A good example for nested templates is the definition of a group of four knobs as ADSR envelope controls.

---

### PROCEDURE

1. Create a new template named **ADSR Knobs** and click **Edit Element** on the toolbar.
2. To this template, add four knob templates that each contain a label and a text field.
3. In the **Properties** section for the knob parameters, you will find the template parameters **Value**, **Unit**, and **Label**.
4. Click the **Export Property** buttons for the **Value** parameters of the four knobs and name them **ValA**, **ValD**, **ValS**, and **ValR**, for example.  
This creates independent parameters in the template.
5. For the **Label** parameters, enter **A**, **D**, **S**, and **R**.

---

### RESULT

You created the nested Template **ADSR Knobs**. When you use the **ADSR Knobs** template, the labels will always be A, D, S, and R, but the knobs can be freely connected to any envelope.

## Using Templates From Libraries or Macro Pages

You can use the **Resource/Library Browser** to browse the content of existing macro pages and use them in the current macro page.

The **Resource/Library Browser** shows the templates that are available in the macro pages and allows you to drag and drop them from there. All the necessary resources are also copied from the source macro page to the current macro page.

---

### PROCEDURE

1. Navigate to the library or the macro page that contains the template that you want to use.  
If the file contains sub-libraries, navigate to the sub-library.
2. Drag the template from the **Resource/Library Browser** to the canvas or to a group on the canvas.  
The destination lights up to indicate where the control will be placed.

---

## Editing Templates

---

### PROCEDURE

1. In the **Templates Tree**, select the template, and click **Edit Element** on the toolbar.  
The **GUI Tree** opens and shows the template structure. The canvas displays the content of the template.
2. Now, you can enter values manually in the **Properties** section, drag elements from the **Resource/Library Browser**, arrange them on the canvas, etc.

3. When you are done, click **Switch Back to Macro Page/Parent Template** on the toolbar to return to the macro page.
- 

## Variable Export

You can export the value of a variable to create an interface that allows you to connect parameters outside of the template.

For example, you can connect the menu switches of a pop-up menu to the selector control that opens the menu.

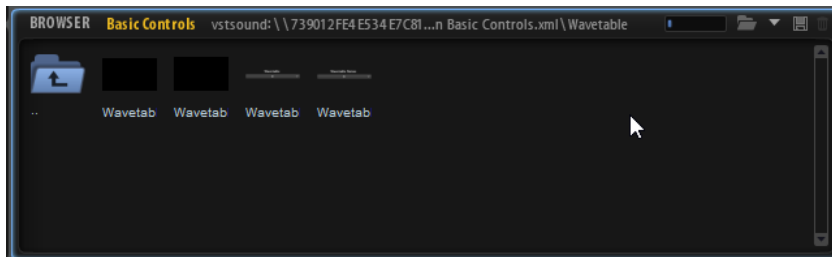
For more details, refer to “Working with exported variables” in the “How-To” section on <https://developer.steinberg.help>.

## Browsing for Files

When creating a macro page, you need a variety of different files. You can work with control libraries, use elements or groups of elements from other macro pages, and even create your own graphical elements in a graphics program and use these in HALion. To browse for all these kinds of files, you use the **Resource/Library Browser**.

The **Resource/Library Browser** gives you access to factory and user libraries that contain templates. It allows you to search for files that you can use in macro pages and allows you to save your favorite browse locations. Furthermore, you can also browse the contents of existing macro pages, which means that you can reuse templates from other macro pages, for example.

To open the **Resource/Library Browser**, click **Show/Hide Resource/Library Browser** on the toolbar.



To specify the folder that you want to browse for files, click the **Select Folder** icon on the toolbar and navigate to the folder on your system, or select one of the locations from the **Select Location** pop-up menu.

You navigate through the folders by clicking the folder icons. If you are not on the topmost level of the hierarchy, the leftmost folder lets you move up a level. To browse the content of macro pages and control libraries, click their icons.

### Browse Locations

By specifying browse locations, you can save shortcuts to the folders that contain control libraries, bitmaps, etc. If you have folders on your hard disks that you often need, save them as browse locations.

- To define a folder as browse location, open it in the **Resource/Library Browser**, click **Save Location** on the toolbar, and save the folder as HALion subpreset. Once a location is defined, you can select it from the **Select Locations** pop-up menu.
- To delete a browse location, click **Delete Location** on the toolbar, select the location that you want to delete, and click **Yes**.

## Adding Elements

You can either add elements directly to the canvas, or you can add them to the **GUI Tree**, the **Templates Tree**, or the **Resources Tree** first.

If you drag an element onto the canvas, a corresponding entry is automatically added to the **GUI Tree**, the **Resources Tree**, and/or the **Templates Tree**.

## Grouping Elements

Grouping elements allows you to structure your macro page content.

- To group selected elements in the **GUI Tree**, the **Templates Tree**, and the **Resources Tree**, open the context menu and select **Group Selection**.

## Editing the Elements on the Canvas

You can edit the elements on the canvas either with the mouse, using key commands, or by editing their values in the **Properties** section.

## Positioning Elements

You can position elements in the following ways:

- Drag the element to another position on the canvas.  
To restrict movement to the horizontal/vertical axis, hold down **Ctrl/Cmd** while dragging in one direction.  
This restricts movement to the direction in which you move the mouse most, that is, you can switch from horizontal to vertical by moving the mouse in this direction.
- Select the element and use the arrow keys.  
To move an element in the coarse steps set on the toolbar, hold down **Shift** and use the arrow keys.
- Select the element and change the **Position** values in the **Properties** section.

### NOTE

If **Enable Coarse Step** is activated, all move actions use the coarse step width.

---

## Resizing Elements

### CHOICES

- Select the element and change the **Size** values in the **Properties** section.
  - To move the upper border of an element, use **Ctrl/Cmd - Shift - Down Arrow / Up Arrow**.
  - To move the lower border of an element, use **Ctrl/Cmd - Down Arrow / Up Arrow**.
  - To move the left border of an element, use **Ctrl/Cmd - Shift - Left Arrow / Right Arrow**.
  - To move the right border of an element, use **Ctrl/Cmd - Left Arrow / Right Arrow**.
  - To adjust the height or width of an element, drag its borders.  
To adjust the width in finer increments, hold down **Shift** while dragging.  
To scale height and width with a fixed ratio, point at the border of an element so that the cursor becomes a double arrow, click and hold the mouse, hold down **Ctrl/Cmd - Shift** and drag.
-

## Copying Elements

---

### CHOICES

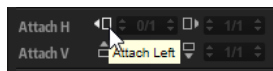
- Hold down **Alt/Opt** and drag it to another position.
  - Hold down **Alt/Opt** and use an arrow key.  
The copy is added with a distance of one pixel. To add a copy at a **Coarse Step** distance, press **Alt/Opt - Shift** and use an arrow key.
- 

## Attaching Objects to Parent Objects

You can attach one or multiple edges of a child object to its parent. This way, changing the size of the parent will also influence the position or size of the child. This is useful for creating your own templates.

If a child object is selected in the **GUI Tree**, the **Attach** options are available in the **Properties** section.

### Attach Left



Activate this button to attach the child to the left side of the parent object. Resizing the parent object to the left will also move the child to the left, to keep its relative position to the left edge of the parent.

### Attach Right

Activate this button to attach the child to the right side of the parent object. Resizing the parent object to the right will also move the child to the right, to keep its relative position to the right edge of the parent.

### NOTE

Attaching the left and right sides resizes the child object horizontally. If the child object provides a **Scale** option, such as images and sections do, for example, the content is scaled.

---

### Attach Top

Activate this button to attach the child to the top border of the parent object. Resizing the parent object by adjusting its top border will also move the top border of the child, to keep its relative position to the top border of the parent.

### Attach Bottom

Activate this button to attach the child to the bottom border of the parent object. Resizing the parent object by adjusting its bottom border will also move the bottom border of the child, to keep its relative position to the bottom border of the parent.

### NOTE

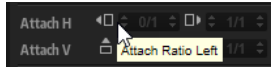
Attaching the top and bottom borders resizes the child object vertically. If the child object provides a **Scale** option, such as images and sections do, for example, the shown content is scaled.

---

## Setting the Attach Ratio

Each **Attach** option features an additional **Ratio** parameter that defines the effective change of the corresponding edge in relation to the edge of the template in which the child is used.

If this parameter is set to 1/1, the border of the edge follows the template edge exactly. With a value of 1/2, for example, the edge only follows with half the speed, which means that if the template edge is moved by 10 pixels, the attached edge is only moved 5 pixels.



- To keep a child unchanged in size but horizontally centered in the template, set the values for left and right to 1/2.
- To keep a child unchanged in size but vertically centered in the template, set the values for top and bottom to 1/2.

## Creating a Template with a Centered Element That Fills the Available Space

Let's say you want to create a template containing a text field and a knob, where you want the text field to be resized horizontally when the size of the template is changed and where you want the knob to remain centered and unscaled.

---

### PROCEDURE

1. For the text field, set **Attach Ratio Left** to 0/1 and **Attach Ratio Right** to 1/1.  
This way, the left edge always sticks to the left side of the template and the right edge follows the right edge of the template exactly. Changing the width of the template equally changes the size of the text field.
2. For the knob, set **Attach Ratio Left** and **Attach Ratio Right** to 1/2.

---

### RESULT

This way, resizing the template by 20 pixels will move the left and right borders of the knob by 10 pixels each, keeping the size of the knob unchanged and its position centered.

## Creating a Template Containing Several Adjacent Elements That Are Equally Distributed

You can create complex constructions, where several child objects are arranged horizontally side by side, and where all children are resized relatively to the template size. Let's say you have four text fields in a row and want them to be resized with the same horizontal ratio when the template is resized in width.

---

### PROCEDURE

1. Attach the left edge of the first text field with a ratio of 0/1.
  2. Attach the right edge with a ratio of 1/4.
  3. Attach the left edge of the second text field with a ratio of 1/4.
  4. Attach the right edge with a ratio of 2/4.
  5. Attach the left edge of the third text field with a ratio of 2/4.
  6. Attach the right edge with a ratio of 3/4.
  7. Attach the left edge of the fourth text field with a ratio of 3/4.
  8. Attach the right edge with a ratio of 4/4.
-

## Scaling Elements

You can scale bitmap resources to make them fit on your macro page.

---

### PROCEDURE

1. In the **Resources Tree**, select the resource.
  2. In the **Properties** section, select a **Scale Mode** for the image.
    - Select **Stretch** to stretch or compress the image to fill the new space.
    - Select **Tile** to repeat the image, that is, to insert several instances of the image next to each other, as often as necessary to fill the new space.
    - Select **Tileborder** to fill the area outside the margin lines with the bitmap content, the center area of the bitmap remains empty. This allows you to create a resizable border for an element on the macro page, for example.
  3. In the **GUI Tree**, select the element that uses the bitmap, activate **Scalable** in the **Properties** section and adjust the **Size** values for the bitmap.
- 

## Aligning Elements on the Canvas

Guide lines help you align controls and other elements on the canvas.

### PREREQUISITE

**Show Guide Lines** is activated on the toolbar.

---

### PROCEDURE

1. Right-click the canvas at the position where you want to add the guide line and select **Add Horizontal Guide Line** or **Add Vertical Guide Line** or click in the ruler and drag the mouse onto the canvas.
  2. Move the guide line to the exact position.  
The pixel position is indicated while moving a guideline.
- 

## Creating Pages on the Macro Page

### PROCEDURE

1. In the **GUI Tree**, click **Add Element** and select **Stack**.
  2. Select the stack element on the canvas and drag its borders so that the stack size matches the size of the macro page.
  3. Right-click the stack element in the **GUI Tree** and select **Create > Group**.
  4. Drag the borders of the group element so that it matches the stack size.
  5. Repeat the last two steps, so that you get a stack with two child groups.  
Those child groups are the pages of your macro page.
  6. Add and edit the elements on both pages.
- 

### AFTER COMPLETING THIS TASK

You can now create variables that allow you to switch between the pages.

RELATED LINKS

[Switching Between Two Pages Using a Single Switch](#) on page 532

## Bitmaps Used In Controls

Most of the controls use bitmap resources for their graphical representation. The number of required bitmap resources depends on the control and its configuration. For example, a switch requires up to six different bitmap resources, to display its off, on, and hover states and their equivalents when clicked with the mouse.

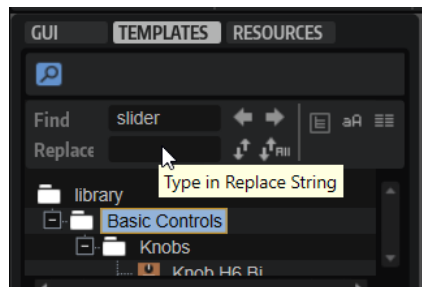
To assign a bitmap resource to a control, do one of the following:

- In the **Properties** section, click the **Select File** button to the right of the **Bitmap** field and select one of the available bitmaps.
- In the **Resource/Library Browser** or the File Explorer/macOS Finder, navigate to and select the bitmap file that you want to use and drag it onto the **Bitmap** field in the **Properties** section for the control.

## Search and Replace

The **GUI Tree**, the **Templates Tree**, and the **Resources Tree** all feature a search and replace function. This is useful to find content when you work with a lot of content files, for example.

To open the search options, click the **Search** button at the top left of the tree. You can search for elements by entering a portion of the name or property value that you are looking for in the **Find** text field. With the arrow buttons, you can step through the found elements.



### Only Visible

If this button is activated, the search is limited to the elements that are located in expanded tree branches. Collapsed parts of the tree are not searched.

### Case Sensitive

If this button is activated, the search is case sensitive.

### Search in All Attributes

If this button is activated, the search is extended to all values in the **Properties** section. By default, only the name is included in the search.

You can also replace strings that were found with another string. **Replace Current Selection** only replaces the selected string. **Replace All** replaces all found strings in the tree with the replacement text.



## UI Parameters and Variables

Not all macro page controls need to be connected to engine or script module parameters. Sometimes, you need so-called UI parameters to perform functions on your macro page, for example, to switch between pages or to activate specific editing features.

To be able to connect macro page controls with UI parameters, you must first add variables and then define them in the **Properties** section.

Variables can either be created for templates or for the macro page itself if you want to use them globally.

## UI Variable Types

Which of the available variable types to use depends on the parameter that you want to connect. For example, the **Index** parameter of a node in an envelope requires an **Integer** variable, and the **Level** parameter of the node requires a **Float** variable.

You can find out the type of a parameter in the **Type** column in the **Parameter List**.

### NOTE

If the **Type** column is not shown, right click a column header and activate **Type**.

---

### Float

Uses numbers with a decimal point. The properties are **Name**, **Value**, **Minimum**, **Maximum**, and **Precision**. **Precision** defines the number of digits after the decimal point.

### Integer

Uses positive and negative natural numbers. The properties are **Name**, **Value**, **Minimum**, **Maximum**.

### Popup List

Uses a list of template name strings. You can open a template that is referenced in the list, that is, show it on top of the other elements in the macro page, by setting the variable to the value that corresponds to the index of the template in the list. The properties are **Name** and the list entries. You can enter the names of the templates that you want to use in the text fields.

### Rational

Uses a fraction. The nominator and denominator can be set individually. The properties are **Name** and **Value**. An example of this variable is the **Time Beat** text control template within the **Envelope** template that comes with the "Basic Controls" library.

### String List

Uses a list of strings. These strings are used to fill a menu control. This can be used for **Sync Note** function in the envelope, for example. The properties are **Name** and the list entries. You can enter the string that you want to add in the text field.

### String

Uses text. The properties are **Name** and **Value**.

## Adding UI Variables

Before you can use variables, you must add them to your macro page.

---

### PROCEDURE

1. In the **GUI Tree**, either select the macro page or the template, depending on where you want to use the variable.

2. Right-click and select **Create > Variables**.

This creates the folder in which all variables are saved.

### NOTE

If you use a large number of variables, it might be necessary to organize them by creating further subfolders. To do so, right click the **Variables** folder and select **Create > Variables**.

3. Right-click the **Variables** folder and select the type of variable that you want to add from the **Create** submenu.

---

### AFTER COMPLETING THIS TASK

Now you can name the variable and make settings for it in the **Properties** section.

### RELATED LINKS

[UI Variable Types](#) on page 531

## Switching Between Two Pages Using a Single Switch

You can use variables to switch between the pages of your macro page.

### PREREQUISITE

- You have created a **Stack** element that contains two groups, one for each page.
- You have added a **Variables** folder to your macro page.

---

### PROCEDURE

1. In the **GUI Tree**, right-click the **Variables** folder and select **Create > Integer**.
2. In the **Properties** section, name it **pages**.
3. Set **Minimum** to 0 and **Maximum** to 1.
4. Add an on/off switch to the macro page.
5. For both the switch and the stack, set **Value** to **@pages**.



This connects the two values.

---

### RESULT

You can now switch between the two pages using the on/off switch.

## Switching Between Multiple Pages Using Radio Buttons

If you have more than two pages on your macro page, you can use radio buttons to switch between the pages, rather than an on/off switch.

### PREREQUISITE

You have created a **Stack** element that contains four groups, one for each page.

You have added a **Variables** folder to the macro page.

---

### PROCEDURE

1. In the **GUI Tree**, right-click the **Variables** folder and select **Create > Integer**.
2. Name the variable **pages**.
3. In the **Properties** section, set **Minimum** to 0 and **Maximum** to 3.
4. On the macro page level, add a radio switch for each page.
5. For all the radio buttons, set **Value** to **@pages**.
6. Set the **Onvalue** parameters to 0, 1, 2, and 3, respectively, so that they match the four pages.
7. For the stack, set **Value** to **@pages**.



8. Activate **Test Macro Page** and use the radio buttons to open the different pages.

---

### RESULT

You can now click one of the radio buttons to display the corresponding page of the stack.

## Opening an About Box from the Macro Page

If you want to present background or related information for the program that is connected to your macro page, you can create an about box, that is, a separate information page, and make it accessible as a pop-up panel.

### PREREQUISITE

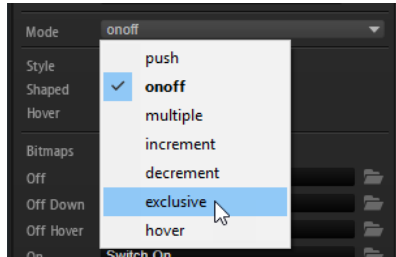
- You have created a macro page for your program.
- You have added a **Variables** folder to the macro page.
- You have created a bitmap that contains the information that you want to show in the about box.

---

### PROCEDURE

1. In the **Templates Tree**, add a template and name it **About**.
2. On the toolbar, click **Edit Element** and set the size of the template to the size of the macro page.
3. Add the about box bitmap by dragging it from the **Resource/Library Browser** onto the canvas.
4. Position the bitmap where you want the about box to appear.
5. Optional: If necessary, activate **Scalable** in the **Properties** section and specify the correct size for the about box.
6. Click **Switch Back to Macro Page/Parent Template**.
7. In the **GUI Tree**, create a **Popup List** variable for the macro page and name it **aboutbox**.

8. In the **Properties** section for the variable, enter **About** in the first line.  
This connects the variable to the **About** template.
9. Add a switch to the macro page by dragging it from the **Resource/Library Browser** to the **GUI Tree**.
10. Click **Edit Element** on the toolbar, select the switch element, and set the **Mode** to **exclusive**.



This way, the switch performs one exclusive switching operation. In this case, we want it to open the about box.

11. Set the **Onvalue** for the switch to 1.
12. Set the **Value** parameter to **@aboutbox** to connect it to the **Popup List** variable.  
If you now click the switch, it sends a value of 1 to the **Popup List** variable. This will open the **About** template that is located at the first line in the variable.
13. Click **Switch Back to Macro Page/Parent Template**.
14. Activate **Test Macro Page** on the toolbar and click the switch.  
This opens the about box at the specified position on the canvas. Now, you need a way to close the about box again.
15. Deactivate **Test Macro Page**, open the **Templates Tree**, select the **About** template and click **Edit Element** on the toolbar.
16. Click **Create New Element** and select a switch to the **About** template.  
We want to switch back to the macro page by clicking anywhere on the page, therefore, we need a simple switch in the size of the macro page, which does not contain a label.
17. Select the switch and click **Edit Element**.
18. Adjust the size of the switch so that it spans the entire macro page.
19. Set the **Mode** to **exclusive**.
20. Set the **Value** to **@aboutbox** to connect the switch with the **Popup List** variable.
21. Set **Onvalue** to 0.  
This way, the **About** template is removed from the macro page when the switch is pressed.
22. Go back to the **GUI Tree** for the macro page by clicking **Switch Back to Macro Page/Parent Template** and activate **Test Macro Page**.
23. Click the switch on the macro page to open the about box and click anywhere on the page to close the about box again.

---

## Edit Scope

The edit scope allows you to specify for a group or template on the macro page which module, effect, layer, etc., will be affected by it.

The scope is defined with the path to this object.

You can either enter the path to the object manually in the **Scope** value field in the **Properties** section, or you can drag one of the parameters of the object from the **Parameter List** onto the **Scope** value field.

#### NOTE

Dragging a parameter onto the **Scope** value field is a quick and easy way of setting the scope for an element on your macro page. However, note that when you drag a parameter onto the **Scope** value field, the entire path is inserted, including the parameter ID. Be sure to delete this part from the value field. Otherwise, only this parameter will get the scope, not the entire object.

---

## Path Syntax

A path always starts with an @, followed by the object, that is, the module, layer, bus, etc.

To specify an object, you can either address it by object and counter or by counter and name.

### Object:Counter

- @bus : n defines the n-th bus
- @layer : n defines the n-th layer
- @zone : n defines the n-th zone
- @matrix defines the modulation matrix within a zone
- @row : n defines the n-th row within the modulation matrix

### Counter:Name

@n : Name defines the n-th object with this specific name

If the object that you want to address is located deeper in the program hierarchy, add a slash and continue with the next object.

---

#### EXAMPLE

- @layer : 1/@0 : Bus2/@0 : Chorus1/ defines the first object that is called "Chorus1" in the first object "Bus2" in the second layer.
  - @0 : LayerA/@0 : ZoneB/ defines the first object that is called "ZoneB" in the first object that is called "LayerA".
- 

## Addressing Multiple Objects at the Same Time With A Single Control

You can specify both the path and the type of an object on which a control should work. For example, this allows you to control the **Pitch** parameter of all zones in a layer with a single knob. In this case, the last part of the path must be @type : Zone.

### Type:Object

The following object types can be set:

- Zone for zones
- Bus for busses
- Layer for layers
- <name of the effect > for all effects with this name
- <name of the MIDI module> for all MIDI modules of this type, that is, all FlexPhrasers, MIDI Player modules, etc.

---

EXAMPLE

- @layer : 1/@0:Bus2/@type:Chorus/ defines all chorus effects in the first object that is called "Bus2" in the second layer
  - @0:LayerA/@type:Zone/ defines all zones in the first object that is called LayerA
  - @type:Layer/ defines all layers in the program
- 

NOTE

For programs, no additional path information is required. Every path starts relatively to the program.

---

## Using a Single Set of Controls To Control Parameters for Different Layers

An edit scope allows you to add a single set of controls and apply it to different objects. For example, if you have a program that contains several layers that all have the parameters **Octave**, **Coarse**, **Fine**, etc., you can create one set of controls for these parameters, and then switch the edit scope between the layers.

---

PROCEDURE

1. Create a program with two layers and name them **LayerA** and **LayerB**.
2. Create a macro page for the program.
3. In the **GUI Tree**, add a group to your macro page.
4. Add a knob control to the group.
5. To connect the engine parameter to the knob, open the **Parameter List** and drag the **Coarse** parameter for layer A onto the **Value** field of the knob in the **Properties** section.  
The field now displays **LayerA.Coarse**.
6. Click the **Value** field of the knob.  
Now, the entire path to the engine parameter is displayed. In this example @0:LayerA/@id16.
7. Cut the first part of the path information, that is, @0:LayerA/, and paste it to the **Scope** value field of the group.  
The dynamic **Scope** only requires the parameter ID, in this case, "@id16". The first part of the path, that is, @0:LayerA/ is required as **Scope** information for the group.
8. Copy the path information into the **Scope** value field of the group.
9. Add a **Variables** folder to the macro page.
10. Create a **String List** variable and name it **LayerSelect**.
11. Copy the path information from the **Scope** value field of the group to the first entry line of the string list variable.
12. Copy the same path information to the second entry line and change **LayerA** to **LayerB**.  
The variable switches between two path strings. Now, you need a control that switches between these two strings.
13. Add a menu control to the macro page.  
You can also use other controls like knobs or radio switches to change the scope.
14. In the **Value** field of the menu, enter **@LayerSelect**.

15. In the **Scope** value field of the group, enter **@LayerSelect** as well, so that the menu and the group are both using the same variable.
16. You can now use the menu to switch between the two scopes of the group, that is, you can select the layer that is affected.

#### NOTE

If you want the controls to work in a dynamic scope, first add the path information to the **Scope** value field of the group and then connect the engine parameters to the controls. This way, HALion automatically detects that there is an edit scope and only adds the subpath, or in the simplest case the parameter name, to the **Value** field when you drop the engine parameter.

Before dragging a parameter from the **Parameter List**, make sure that the object from which you want to drag the parameter is selected in the **Program Tree**. Otherwise, HALion cannot retrieve the correct parameter name and will only show the parameter ID instead.

---

## Libraries

Libraries are identical to macro pages, except that they do not include a functional user interface. Libraries can contain templates and their resources, as well as any further useful content for macro pages.

You can open and edit libraries in the **Resource/Library Browser**. Libraries are visualized with a light bluish background to distinguish them from bitmap resources, for example. When you click a library, its contents are shown. If a library contains folders, these are displayed in a blue color to distinguish them from the folders provided by the operating system.

You can edit libraries in the same way as macro pages. For example, you can create new templates, insert templates by dragging them from another macro page or library into the new library, create new folders inside a library file, drag templates from libraries to a macro page, etc.

To edit a library, right-click it in the **Resource/Library Browser** and select **Edit Library**.

#### NOTE

To make editing operations such as copying easier, open two **Macro Page Designer** windows, so that you can drag elements from one window to the other.

---

## Icons for Libraries and Macro Pages

For macro pages, the **Resource/Library Browser** shows a preview picture of the macro page.

If you want to get such a preview picture for your library files, you can define a small and basic macro page inside the library by adding some of the most representative elements to the canvas and then saving the library.

## Connecting Macro Page Controls to HALion Parameters

To be able to use a macro page control, you must connect it to a parameter in HALion.

You can establish the connection between control and parameter by using the context menu or via drag and drop. You can connect parameters from the **Parameter List** or from another HALion editor.

## Connecting Parameters Via the Parameter List

---

### PROCEDURE

1. In the **Parameter List**, navigate to the parameter that you want to connect, right-click it and select **Connect to Macro Page**.
2. In the **GUI Tree**, navigate to the control that you want to connect to the parameter, right-click it, and select **Connect to Parameter <HALion parameter name>**.  
If you now click the value field, it shows the parameter ID of the connected HALion parameter.

---

### RELATED LINKS

[Removing a Connection](#) on page 539

## Connecting Parameters Via an Editor in HALion

---

### PROCEDURE

1. Right-click a control in the **Sound Editor**, **Zone Editor**, etc. and select **Connect to Macro Page**.
2. In the **GUI Tree**, navigate to the control that you want to connect to the parameter, right-click the **Value** field in the **Properties** section, and select **Connect to Parameter <HALion parameter name>**.  
If you now click the value field, it shows the parameter ID of the connected HALion parameter.

---

### RELATED LINKS

[Removing a Connection](#) on page 539

## Connecting Parameters Via Drag and Drop

---

### PROCEDURE

1. In the **GUI Tree**, navigate to the macro page control to display its properties in the **Properties** section.
2. In the **Parameter List**, navigate to the parameter that you want to connect.
3. Do one of the following:
  - Drag the parameter name and drop it on the value field of the control in the **Properties** section.
  - Drop the parameter name onto the control on the macro page canvas.The value field in the **Properties** section then shows the parameter ID of the connected HALion parameter.

---

### RELATED LINKS

[Removing a Connection](#) on page 539



## Connecting Multiple Parameters of the Same Type In One Go

---

### PROCEDURE

1. Connect the first parameter.
2. In the **Properties** section, right-click the value field for the control and select **Connect All <parameter name> Parameters**.

This connects all parameters of the same name that only differ by a number. For example, this allows you to connect all step parameters of the step modulator with the corresponding step modulator control values.

To disconnect all values, open the context menu and select **Disconnect All <parameter name> Parameters**.

---

### RELATED LINKS

[Removing a Connection](#) on page 539

## Removing a Connection

If you connected a control to the wrong parameter or if you modified the macro page and want to set up a different connection for a control, you can delete the connection of a control.

---

### PROCEDURE

1. Open the **GUI Tree**.
  2. Do one of the following:
    - In the **Properties** section, navigate to the macro control and delete its **Value** entry.
    - Right-click a control and select **Disconnect from Parameter <HALion parameter name>**.
- 

## Collaboration on Macro Pages

If you want to work on macro pages together with other users, you must make sure that you exchange all the added and required content.

For this, HALion allows you to export the macro page together with its resources.

You can find guidelines and further information in the Steinberg Developer Resource pages under <https://developer.steinberg.help>.

### RELATED LINKS

[Exporting Macro Pages with their Resources](#) on page 540

## Cleaning Up and Consolidating Your Macro Pages

Before finalizing your macro pages, you may want to remove any unused files, or consolidate names and locations of the resource files used in the macro page. HALion offers you several tools for cleaning up the macro page content.

### Removing Unused Files

When you create your macro pages, you will most probably try out different templates from various libraries. You will add various bitmaps that you want to try out as background images, etc. Every time that you add an element or a template to the macro page, the templates and resources are automatically added to the **Templates Tree** and the **Resources Tree**. All these will remain in your macro page file, even if they are not used on the macro page. Therefore, the **Macro Page Designer** allows you to automatically remove any unused template or resource files from the macro page.

- To remove unused templates, open the **Templates Tree** context menu and select **Remove Unused Templates**.

The **Macro Page Designer** verifies whether the existing templates are referenced by elements on the macro page or by templates that are used on the macro page. The templates that are not used are moved to the **Trash** folder in the **Templates Tree**, where you can delete them.

- To remove unused resources, open the **Resources Tree** context menu and select **Remove Unused Resources**.

The **Macro Page Designer** verifies whether the existing resources are referenced by any controls on the macro page or by a template. The resources that are not used are moved to the **Trash** folder in the **Resources Tree**, where you can delete them.

#### NOTE

To perform both these cleanup operations at the same time, use the **Templates Tree** context menu command **Remove All Unused Templates And Resources**.

#### IMPORTANT

These cleanup functions can be performed without any risk if all templates and resources are directly linked to the macro page. However, there are certain limits. For example, when you are using a template that references a string variable that itself is controlled by another parameter, it is not possible for the cleanup function to determine that this template is used and it will be moved to the **Trash** folder. To prevent this, activate the **Protected** button in the **Properties** section for the template. This excludes the template from cleanup.

### Exporting Macro Pages with their Resources

When you assemble a macro page, you will most probably try out and use resources from different folders and libraries, with different naming conventions and different folder structures. HALion imports and references all these files without problems. However, there may be situations where you want to clean up the macro page structure, for example, if you want to share your work or make the setup more understandable to other users. In this case, you can export the macro page with its resources.

#### PROCEDURE

- In the **Macro Page Designer** toolbar, click **Export Macro Page/Library**.

#### RESULT

A `macropage.xml` file is created, together with a `ui_scripts` folder (if used) and a `resources` folder. The structure of the `resources` folder reflects the tree structure of the contained resources and templates. All resources are renamed according to their names on the macro page and all references are adapted.

#### RELATED LINKS

[Removing Unused Files](#) on page 540

## Saving Macro Pages

- To save your macro page, click **Save Macro Page/Library**, specify a name and a location, and click **Save**.

As soon as a macro page is saved, the program references this new macro page file. It can be loaded into the **Macro Page Designer** and connected to a program, layer, or MIDI module.

#### NOTE

If you save the program in HALion, the corresponding macro page file on your hard disk is automatically saved, too. However, note that the macro page is not saved automatically when you save the project in your host application. If you try to open a project that contains a macro page file that is older than the one that is saved on your system, you will get a warning message.

---

# Library Creator

The **Library Creator** allows you to create your own instrument libraries.

These instrument libraries can be distributed between computers using Steinberg's **Library Manager**. A library can consist of either a single VST Sound container or a combination of VST Sound containers. VST Sound is a Steinberg container format comparable to ZIP or ISO files, for example. It contains a file structure with folders and files. Once a library is registered in the **MediaBay**, its containers are mounted, and all Steinberg products that contain a **MediaBay** can access the folders and files within the library.

For further information, go to: <https://developer.steinberg.help>.

## Libraries

Libraries are built as VST Sound container files that contain all the components that make up your instrument, such as presets, samples, macro pages, MIDI modules, scripts, and sub presets.

When working with HALion, all presets are managed by the **MediaBay**. Often, presets refer to other files, such as samples, macro pages, and Lua scripts. Combining presets with all the referenced files into a library makes it easy to distribute them and to protect them against being modified or deleted.

## Associating Presets With Libraries

The **MediaBay** is the central place where all information about presets is stored. This information is added by tagging the presets with a variety of attributes that describe the preset characteristics, the instrument category they belong to, the author of the preset, etc. One of those tags is the **Library Name**.

If you specify the same **Library Name** for all presets that you want to belong to a particular library, they become part of this library, and the **MediaBay** allows you to restrict your search to this library only. This means that if you save a new preset, you can add a specific **Library Name** to it to assign it to an existing library.

## Target Users and Creation Process for Libraries

Before you create a library, you must decide who your target users or customers are.

You can build a library that only HALion users can use, for example, which gives you the freedom to build a macro page that is larger than the size that HALion Sonic supports. However, this limits the number of potential users.

It is more likely that you intend to build a library that is compatible with HALion Sonic, which means that it can be used by everybody. HALion Sonic is freely available for download on the Steinberg web site.

If you want to create a library accessible to all users, you must export your program as a HALion Sonic layer preset.

## Prerequisites

To create a library, you need a program that is set up the way you want it and that can be played and adjusted via the quick controls and the macro page.

The following steps need to be completed prior to creating a library.

1. You have sampled the required sounds and noises.
2. You have cut and processed the samples.
3. You have mapped the samples to the keyboard.
4. You have structured the samples in layers, for example, for different articulations.
5. You have set up the program so that you can switch between articulations, either using MegaTrig or your own Lua script.
6. You have added the MIDI modules to be used by the instrument, for example, a MIDI player.
7. You have added custom script code to process some special playing features.
8. You have added busses and effects to control the audio routing and deliver the integrated effects intended to be part of the instrument.
9. You have configured the quick controls.
10. You have built a macro page with all the knobs, sliders, and other control elements.
11. You have assigned the macro page to the program.

### NOTE

If you want your library to work in HALion Sonic, the **Program Tree** should contain a program and a layer. The program is exported as a HALion Sonic layer and contains the macro page and the quick control assignments. The layer contains all samples, synth zones, sublayers, MIDI modules, internal busses, and effects.

---

## Creating a Library

Let us assume that you have inherited a precious and unique acoustic guitar, for example, and you think it is worth building a virtual version of it so that you can play it with your keyboard. You have sampled the guitar sounds and noises, and now you intend to build a library named **Precious Guitar**.

### PREREQUISITE

- You have exported your program under the name **Precious Guitar Layer** by selecting **Import/Export > Export Program as VST 3 Preset** from the **Program Tree** context menu and activating **As HALion Sonic Layer** in the **Export** dialog.
- You have saved the preset under the name **Init Precious Guitar**, and you have set up all the necessary tags, such as **Category**, **Sub Category**, **Author**, **Character**.

### NOTE

Do not specify the **Library Name** and **Manufacturer** attributes at this point, because on building the VST Sound container, these tags are overwritten by the attributes defined for the library.

---

- You have created the required presets for the library.  
A quick and easy way to do this is to create variations from the first preset.

#### PROCEDURE

1. In the **Properties** section of the **Library Creator**, assign icons for the **MediaBay** and the library selector.
2. Set the **Name** to **Precious Guitar**.
3. Set the **Long Name** to **Precious Guitar**.
4. Set the **Family** to **HALion Sonic**.
5. Add the name of your company under **Manufacturer**.
6. Optional: Add a URL to your web site.
7. In the **Output Path** field, specify a location for the VST Sound containers.
8. In the **VST Sound Containers** list, set the file name of the VST Sound container to **<name of your company>\_001\_Precious Guitar**.
9. Set the name of the library to **Precious Guitar Samples and Presets**.
10. Set the **Version Number** to 1.
11. Optional: Select a compression method, and add a comment.  
You have now defined the basic settings for your library and can start to add presets and other files.
12. Select the VST Sound container in the **Structure** section, and drag all presets into the **Content** section.  
A VST 3 Presets folder is added, which contains all presets.  
The **Unassigned Samples** list now lists any samples that are used in the presets.
13. Select all samples from the list, and drag them onto the **Content** section.  
A Private Audio Files folder is added to the **VST Sound** section, and all samples are placed inside it. If you do not want to provide any sub presets for effects or MIDI modules, you can now create the container.
14. Click the **Build Library** button on the toolbar.  
If the preset consistency check discovers any issues, a red warning triangle is shown, allowing you to fix issues, such as missing tags, etc.

#### NOTE

If you added custom icons to your programs, these are automatically added to the VST Sound container and are used when you load presets from the library.

- 
15. Click **Save Library** to save the library to a location on your disk.
- 

#### RESULT

You have now built the container, and the library is ready to be used.

#### NOTE

You can modify presets and the macro page and build the container again at any time. The **Library Creator** always refers to the current state of the files when processing them.

---

## HALion Sonic Edit Mode

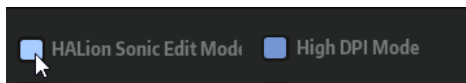
**HALion Sonic Edit Mode** allows you to edit a HALion Sonic preset in HALion and then save it in its original preset format, so that it can be opened in the plug-in that it was created in.

When preparing HALion Sonic libraries, the most common workflow is probably the following one:

- 1 In HALion, you create a HALion Sonic Init layer which represents the instrument.
- 2 You load this Init layer into HALion Sonic.
- 3 You create your HALion Sonic program preset using up to four of the Init layers.
- 4 In the **Library Creator**, you build your VST Sound library that contains the final presets.

In step 3, you are likely to create a large number of presets. There may be situations where you want to modify the Init layer preset from which you started. If these modifications cannot be performed in HALion Sonic, for example, because you must connect a module or parameter to your macro page, you must load the preset into HALion, perform your fixes and save the result as a HALion Sonic preset. If you already created program presets that use this Init layer preset, these steps must be performed for all the program presets. In this case, **HALion Sonic Edit Mode**, in combination with scripting, allows you to automatically modify numerous presets at the same time.

You activate **HALion Sonic Edit Mode** in the **Edit** section of the **Options Editor**.



### NOTE

Presets from Triebwerk, Hypnotic Dance, Dark Planet, HALion Symphonic Orchestra, and Neo Soul Keys are not supported by **HALion Sonic Edit Mode**.

---

### RELATED LINKS

[Edit Section](#) on page 44

## Verifying Your Libraries

After creating a library, the next step is to check whether it is functional.

A quick and easy way to check the library is to temporarily mount the container for testing.

One of the advantages of this method is that you can rebuild the container if something needs to be fixed. HALion automatically identifies modified containers.

### PROCEDURE

1. On the toolbar, click **Mount VST Sound containers temporarily to HALion MediaBay**.  
This way, the container is temporarily registered and mounted.
2. You can now access the presets using the **Load** page.  
Mounting the container only temporarily allows you to rebuild it over and over again while keeping HALion's **MediaBay** up-to-date. The only thing you have to ensure when rebuilding the library is that you have to unload all presets and especially samples from this library. Otherwise, you may get a message that the library cannot be written.
3. When you are done, unload HALion to release the container file from being used.

As soon as you unload HALion or close the project, the container is unmounted. If you reload the project at a later time, you have to mount the library again. VST Sound containers are added to a location that is also surveyed by HALion Sonic, which means that you can check the library there.

NOTE

If you rebuild the container, you must quit the host application and open it again before you can see the updated container.

---

4. Copy the new container to the location of the final library.
5. Reload HALion.

NOTE

You can also verify the functioning of a library using Steinberg's **Library Manager**.

---

RESULT

You have verified that the library is functional, and you are now ready to distribute it to friends and/or customers.

## Macro Page Resources

When building a library, it is necessary to add the macro pages and scripts that are used by the presets. This includes all bitmap and font resources as well as all scripts and UI scripts. These files are included in the VST Sound container that contains the preset files. However, the files are not shown in the **Structure** section.

NOTE

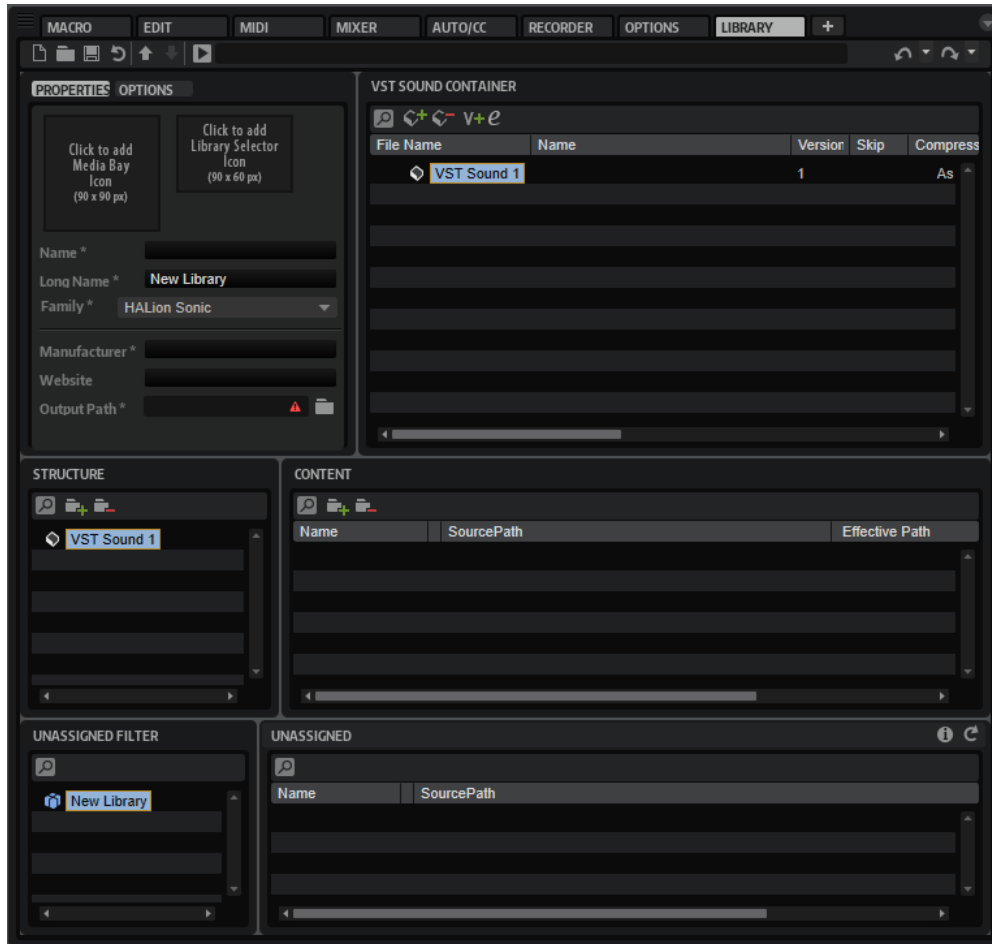
Usually, a library only contains one VST Sound container with presets. If you distribute presets among several VST Sound containers, the macro page and script resources are automatically added to each container. Thus, to update your macro page or scripts, you must rebuild all preset containers and make them available to the user, to ensure that all presets use the updated macro page.

---



## Library Creator Editor

The **Library Creator** is available as a HALion editor.



The editor is divided into three rows, each consisting of two panes. In the topmost row, you can set global properties for the libraries and allocate VST Sound containers to them.

In the second row, the VST Sound container is represented by a tree structure in the **Structure** section and as a file list in the **Content** section.

In the third row, the **Unassigned Filter** section allows you to filter the list of unassigned samples and VST Sound containers to its right.

### NOTE

Although the **Library Creator** is part of HALion, it has no direct relation to the currently loaded multi and its programs and works on its own library document.

You can only edit one library per HALion instance.

---

## Toolbar

The main toolbar provides the most important functions.



### **Create Library**

Allows you to create a new library.

### **Load Library**

Allows you to load a library.

### **Save Library**

Saves the current library.

### **Revert to Last Saved Library**

Reloads the last version that was saved. This discards all changes that have been made.

### **Mount VST Sound containers temporarily to HALion MediaBay**

Allows you to temporarily mount the VST Sound containers that you created for this library to the **MediaBay**. This way, you can check the build result without having to register the library. At this state, you can still make changes to the files and rebuild the container, and the **MediaBay** is automatically updated. As soon as a library is registered and mounted in HALion or HALion Sonic and a Steinberg DAW, it cannot be updated on-the-fly. In this case, you must close all applications and plug-ins that have access to the VST Sound container before you can see the changes. VST Sound containers are unmounted automatically when HALion is unloaded.

#### **NOTE**

When you build libraries for HALion Sonic, they also appear in the **MediaBay**. However, if you have to rebuild the container, you must unload and reload the plug-ins to reflect the changes.

---

### **Unmount temporarily mounted VST Sound containers from HALion MediaBay**

Allows you to unmount any temporarily mounted VST Sound containers.

### **Build Library**

Starts the build process for the library. During the process, a progress bar is shown.

### **Library Path**

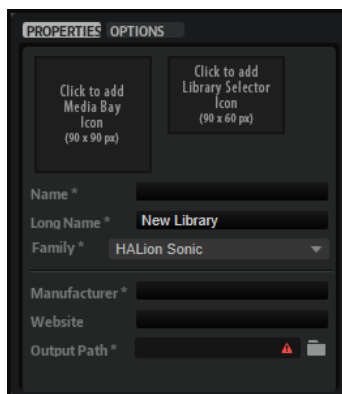
Displays the location and the name of your library. Changing the name here allows you to save the library as a new version.

### **Undo/Redo**

The **Library Creator** provides an independent undo/redo stack with a history. Any changes in the library file can be undone/redone, but other HALion editing actions are not affected.

## Properties

In this section, you can name the library and add icons and further information. Text fields with an asterisk (\*) are mandatory.



### MediaRack Icon

Click this field to select an icon to be shown in the **MediaBay** of the Steinberg DAW. The image must be a .png file 90 x 90 pixels in size.

### Library Selector Icon

Click this field to select an icon to be shown in the library selector. The image must be a .png file 90 x 60 pixels in size. The preview of the library name below the icon allows you to check whether it needs to be shortened to be fully displayed in the library selector.

#### NOTE

MediaRack and library selector icons support **High DPI Mode**. **High DPI Mode** requires additional bitmap resources. These bitmaps must be saved in the same folder as the standard resolution bitmap. The following naming scheme applies: for double-resolution files, add "\_2.00x" to the end of the file name, for triple-resolution files, add "\_3.00x", etc.

### Name

Allows you to specify the name of the library. If you change the name after having created VST Sound containers, you are asked whether to rename the library or to create a new one. If you create a new library, all VST Sound containers are assigned new unique identifiers.

#### IMPORTANT

It is important not to reuse VST Sound containers with the same identifiers for different libraries.

### Long Name

Allows you to specify a longer version of your library name. This is used in the **MediaBay** of the Steinberg DAW if it is not too long. Otherwise, the standard name is shown.

### Family

Allows you to specify the plug-ins that you want your library to be compatible with.

- **HALion**: These presets cannot be loaded in HALion Sonic.
- **HALion Sonic**: These presets can be loaded in HALion Sonic and HALion.

In most cases, compatibility with HALion Sonic is desirable, as it ensures access to all users. HALion Sonic is available as a free download on the Steinberg web site.

### Manufacturer

Allows you to add your name or the name of your company.

### Website

Allows you to add a URL to your web site.

### Output Path

Allows you to specify the folder on your system into which the VST Sound files are written. Each container is saved in a separate subfolder.

## Options



### Protect Scripts

Allows you to encrypt all script files that are part of the library. The encryption prevents other users from viewing and editing the script code.

### Protect Macro Pages

Protects the macro pages that are used in the library. If a macro page is protected, its structure cannot be viewed or edited in the **Macro Page Designer**. This is useful if you want to export a program as a HALion Sonic layer preset, in which case protecting the program itself is not recommended, because this would prevent the user from accessing the FlexPhrasers of a layer or the effects of the layer bus.

#### NOTE

Protected macro pages cannot be deleted or replaced.

---

### Strip Wavetable Samples

Allows you to remove information about used samples from the wavetable editor. When creating wavetables that are based on samples, the reference paths to the used samples are stored with the presets. This allows you to return to a wavetable and modify some of the wave markers. When making presets available to other users, you can either add all source samples to the VST container, which allows others to modify them, or you can provide the presets with the final wavetables only by activating this option.

### Create Artifact File

Allows you to generate a JSON file that lists all VST Sound containers that are part of the library. The file is named after the library, with the file name extension `.json`, and saved in the same folder as the VST Sound containers.

The JSON file contains SHA-256 checksum files for all included VST Sound containers. These can be used to check that the downloaded files were transferred without errors, for example.

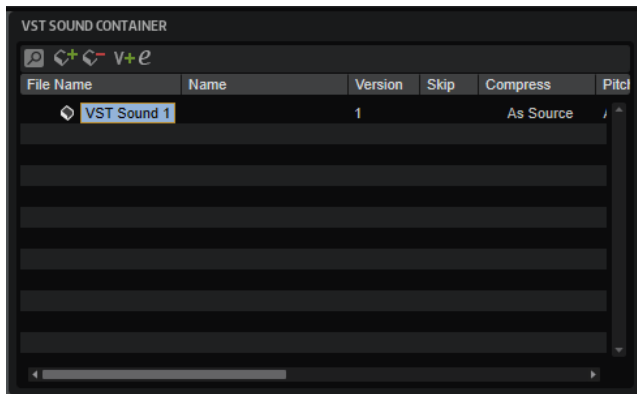
### Clear Sub Preset Names

Allows you to remove all sub preset names from all sub preset selectors when building a VST 3 preset container. This is to avoid delivering program or layer presets that refer to sub presets which only existed on the system of the original sound designer at the time the program or layer preset was saved.

If you do not clear the sub preset names, the user of a library might be tempted to search for these sub presets, even though they are not included in the library.

## VST Sound Containers

**VST Sound Containers** contains all the VST Sound containers that are part of the library, either because you are building the containers or because they are required as an external dependency by the presets that you deliver with the library.



### Toolbar

#### Search

Allows you to search for a specific container, preset, or sample, or to replace strings.

- **Find:** Allows you to enter the text string that you are searching.
- **Replace:** Allows you to specify the text string that you want to use instead.
- **Find Previous/Next:** Allows you to move from one result to the next.
- **Replace Current Selection:** Replaces the text of the current search result.
- **Replace All:** Replaces the text of all search results.
- **Search for Content in all VST Sound containers:** By default, the search is exclusively performed on the list of VST Sound containers. Activate this option to extend the search to the entire library and the lists of unassigned samples and VST Sounds.
- **Case Sensitive:** Allows you to perform a case-sensitive search.
- **Search in all Attributes:** Activate this option to search for text in all attribute columns. Otherwise, only the name column is searched.

#### Add VST Sound Container

Allows you to add a new container to your library.

#### Remove VST Sound Container

Allows you to remove the selected containers from your library.

### Increase Version Number

Opens a window where you can enter information on the changes in this version. When you close the window, your comment is added, and the version is increased by one step.

With multiple VST Sound containers selected, **Increase Version Number** changes the version numbers for all containers. Each version number is increased by one step, and the comment is added to each of the individual VST Sound version histories.

### Edit Version History

Opens a window where you can edit the current version history.

## Attribute Columns

Allow you to define attributes for individual VST Sound containers.

### File Name

Allows you to specify the name of the VST Sound container. The file name extension is .vstsound.

#### NOTE

To prevent conflicts between VST Sound container files of the same name, each container has a unique internal identifier, which is automatically created by the **Library Creator**. Nevertheless, we recommend to use a naming scheme for VST Sound containers that makes them easy to identify. This can be a combination of numbers, an abbreviation for your company, or the library name, for example.

---

### Name

Allows you to add an additional name to be displayed in the **Library Manager**, in the **Details** view for the library.

### Version

Allows you to specify a version number for the VST Sound container. Every time you update the container and distribute it to the public, increase the version number.

### Comment

Allows you to add a comment.

### Skip

Allows you to skip the creation of some containers while building others. For example, if you have created a library with multiple containers, one for the presets and several others for samples, and you only want to update the preset container to fix some issues, activate **Skip** for the sample containers.

#### NOTE

- If presets in your library refer to other VST Sound containers, these containers must be added to the library as external dependencies. For those containers, **Skip** is automatically activated, so that these containers are not rebuilt.
  - You can only rebuild VST Sound containers that you have created yourself.
- 

### Compress

Allows you to compress or convert samples in a VST Sound container.

- **As Source:** No changes are made to the samples.
- **Compress:** All Samples are compressed.

- **Truncate 16 Bit:** All samples are converted to 16 bit.
- **Compress 16 Bit:** All samples are converted to 16 bit and compressed.

### Pitch Info

Allows you to add sample pitch data to a VST Sound container. This data is used for **Solo** mode in the **AudioWarp** section.

- If this parameter is set to **As Preset**, pitch data for samples is only added for samples that are used in presets with **Solo** mode selected in the **AudioWarp** section.
- If this parameter is set to **All Samples**, pitch data for all samples is added to the VST Sound container.

#### NOTE

Activate this option if the user can switch to **Solo** mode on the macro page of the instrument.

---

### Audio Size

This column shows the total size of all uncompressed samples in the container.

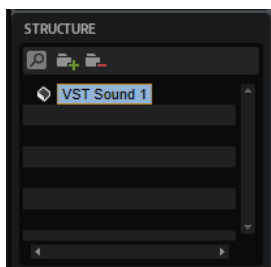
#### NOTE

If compression is used, the final size can differ from this value, depending on the sample content. The final size of the container is also influenced by the amount of additional files, such as presets, sub presets, page resources, etc.

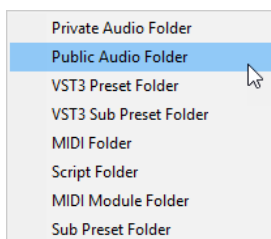
---

## Structure Section

This section displays the internal file structure of the selected VST Sound container. You can add and remove various folders to organize the elements that you want to be part of the container. Some folders are created automatically, to ensure that they can be found by HALion, HALion Sonic and the **MediaBay**.



### Folder Types



### Private Audio Folder

This folder is automatically created when you add presets that contain samples to a VST Sound container. Samples in this folder are not accessible via the **MediaBay**.

### Public Audio Folder

To make your samples accessible via the **MediaBay**, add the samples to this folder.

#### NOTE

Be sure to assign attributes to your samples, to make them easier to find and manage in the **MediaBay**.

---

### VST 3 Preset Folder

This folder is automatically created when you add a preset.

### VST 3 Sub Preset Folder

You can add this folder for presets that are used as sub libraries for layers. These presets do not appear in the **MediaBay** and are only used as source layers that can be loaded into a program via a script. This method is used for the Hot Brass and Studio Strings libraries, for example. For more information, check the “Custom Params” script that is used in these libraries.

### MIDI Folder

If your library makes use of HALion’s MIDI Player module or if you have written a Lua script that can play back MIDI files, you need a **MIDI Folder**. This folder is added automatically on selecting the topmost VST Sound node in the **Structure** section and dragging your MIDI files from the File Explorer/macOS Finder onto the **Content** or the **Structure** section.

If you want to make these MIDI files globally available in the standard HALion MIDI Player module, the MIDI folder must contain the same subfolder structure that is used in HALion, that is, MIDI Files/HALion/Sub Presets/MIDI Files.

If you add a folder associated with the library as a first-level subfolder, users can easily navigate through the MIDI file selector. If you have configured the MIDI file loader on your macro page to load MIDI files from a library-specific folder, you must create the same subfolder structure.

#### NOTE

If your MIDI files are located in the **MIDI Files** folder of your documents folder (User/Documents/Steinberg/HALion/Sub Presets/MIDI Files) and you drag them from there, the correct structure is automatically added in the **Library Creator**.

---

### Script Folder

You can add a **Script Folder** for your Lua scripts. Usually, it is not necessary to manually add scripts to a VST Sound container, because they are added automatically if they are part of a preset.

However, you can create Lua scripts that can be defined as “required” inside other script files. For this case, you can manually add scripts to a VST Sound container. Scripts that require these additional scripts find them and make use of their functions.

#### NOTE

You can also use **Automatically Add Required Files** in the editor for the Lua Script MIDI module. However, this only works if VST presets and scripts are put into the same VST Sound container.

---

Scripts can also be added to a completely different VST Sound container, for example, if you want to create a dedicated library for your scripts.



In this case, you must specify the search path for the Lua “require” function: `package.path = vstsound://<GUID of the required VST Sound container>/resources/scripts/.lua;`

For more information, please refer to the HALion Scripting documentation under <https://developer.steinberg.help>.

### MIDI Module Folder

If you have created Lua script modules and saved them as MIDI modules to make them available in the MIDI Module selector, you can add them to your library, too. Add a **MIDI Module Folder**, and place the modules in there. Once the library is built and the container is registered in the **MediaBay**, they appear in the MIDI module selector. You can also add subfolders to define a folder for your module in the MIDI Module selector. You can add modules to existing folders, such as the **Player** or **Modulation** category, for example, or you can define new categories for your library or company.

### Sub Preset Folder

If your library uses effects, MIDI modules, or Lua modules for which you have created subpresets, you can add a **Sub Preset Folder** for those presets.

#### NOTE

The folder structure must correspond to the settings that you made for the sub preset selector on your macro page. Otherwise, the sub presets cannot be found.

---

## Adding Presets

The main step when building VST Sound containers is to add VST presets. This can be done using drag and drop, either from the **MediaBay** or the File Explorer/macOS Finder onto the **Content** section or the **Structure** section.

When you add presets via drag and drop, a **VST 3 Preset Folder** is created, and all presets are added to it.

You can also create a folder for the presets by clicking the **Add** button  and then dropping presets onto the folder.

You can create multiple **VST 3 Preset** folders and subfolders and add presets to different folders. However, a sophisticated subfolder structure is not required, because all presets are later managed via the **MediaBay**.

## How Samples Are Handled

The **Library Creator** features two different folders for samples: the **Private Audio Folder** and the **Public Audio Folder**. Samples in the **Private Audio Folder** can be used by HALion and HALion Sonic but are not accessible via the **MediaBay**. Samples in the **Public Audio Folder** can be accessed via the **MediaBay**, which means that they can be selected and loaded by the user.

When you add presets that make use of samples, all samples are added to the **Unassigned Samples** list. From there, you can add them, or a selection of them, to a VST Sound container by dragging them onto the **Structure** or the **Content** section.

If you add samples this way, the samples are added to the **Private Audio Folder**. You can create further subfolders within this folder to structure your samples.

If you want your samples to be accessible via the **MediaBay**, add a **Public Audio Folder** to the VST Sound container, and drag the samples into this folder. Samples in this folder are seen by the **MediaBay** and the **Browser**.

## Content Section

This section shows the content of the folder that is selected in the **Structure** section. You can add files to it via drag and drop.



### Search

Allows you to search for a specific container, preset, or sample, or to replace strings.

- **Find:** Allows you to enter the text string that you are searching.
- **Replace:** Allows you to specify the text string that you want to use instead.
- **Find Previous/Next:** Allows you to move from one result to the next.
- **Replace Current Selection:** Replaces the text of the current search result.
- **Replace All:** Replaces the text of all search results.
- **Case Sensitive:** Allows you to perform a case-sensitive search.
- **Search in all Attributes:** Allows you to search for text in all attribute columns. Otherwise, only the name column is searched.

### Add

Allows you to add a folder.

### Remove

Removes the selected folders or files.

### Effective Path

This column shows the path that is created inside the VST Sound container based on the folder structure defined in the **Structure** section. All paths start with `/.AppData/Steinberg` and are followed by file type-specific sub paths.

For example, this allows you to verify that sub presets are written to the correct path inside the VST Sound container, so that they become available on the sub preset selector of the macro page.

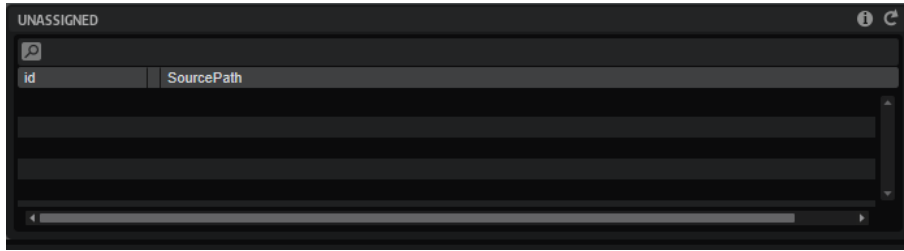
#### NOTE

The effective path shown is not the complete path of a file, which also contains the GUID of the VST Sound archive. To see the complete path, for example, to load files from arbitrary file locations using a script, use the context menu command **Copy Effective Path to Clipboard**, and paste the path into your editor.

---

## Unassigned Section

This section is divided into two tabs: **Samples** and **VST Sound**.



When dropping preset files into a VST Sound container, the **Samples** list is filled with all samples that are required. You can decide which VST Sound container you want them to be part of. In the simplest case, your library only consists of a single VST Sound container, which allows you to drag all samples into the container in the **Content** section. This adds a **Private Audio Folder**, and the samples are placed inside.

A more advanced setup is to add several subfolders to the **Private Audio Folder** and to distribute the samples into these folders, for example, all brass samples to a brass folder, all string samples to a string folder. This allows for a better overview of the contents of the container. To select specific samples, use the **Unassigned Filter** section to limit the selection of samples to the selected presets.

This filter option becomes even more powerful if you want to distribute samples over multiple VST Sound containers. For example, to keep the VST Sound containers smaller than 4 GB so that they can be stored on a FAT32 hard drive or USB stick, drag a part of the samples on one VST Sound container and the rest on another one. This creates a **Private Audio Folder** in each VST Sound container and adds the samples.

As soon as samples are added to a VST Sound container, the sample path references inside the presets are remapped to the new VST Sound container location.

### NOTE

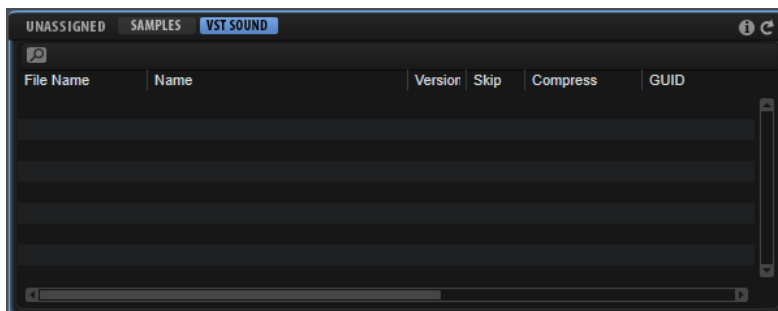
You can also make your samples available for selection in the **MediaBay**. To do so, add them to the **Public Audio Folder**.

### RELATED LINKS

[How Samples Are Handled](#) on page 555

## Unassigned VST Sound Containers

When you add presets to your library that use samples referring to other VST Sound containers, these containers are added to the **Unassigned VST Sound** list as required VST Sound containers.



This allows you to change the structure of your library if you do not want to reference external content. To make your library accessible to a maximum of users, avoid dependencies to other VST Sound containers. If you use presets with dependencies to other VST Sound containers, be sure to inform potential customers/users of your library about these requirements, especially if your library is not accessible for free.

To remove dependencies, you can either modify or remove the corresponding presets.

#### NOTE

- HSB containers are not supported as external dependencies.
- If you build a library for HALion Sonic, for example, external dependencies to HALion Sonic factory VST Sound containers are resolved automatically and are not mentioned in the **Unassigned VST Sound** list, because these containers are also installed on the computer of the end users.

---

#### Search

Allows you to search for a specific container, preset, or sample, or to replace strings.

- **Find:** Allows you to enter the text string that you are searching.
- **Replace:** Allows you to replace text.
- **Find Previous/Next:** Allows you to move from one result to the next.
- **Replace Current Selection:** Replaces the text of the current search result.
- **Replace All:** Replaces the text of all search results.
- **Case Sensitive:** Allows you to perform a case-sensitive search.
- **Search in all Attributes:** Allows you to search for text in all attribute columns. Otherwise, only the name column is searched.

#### Show Issues

Opens a list of issues that have been detected in the added presets during a consistency check.

Click the button to redo the consistency check. This can be useful if the check has detected missing **MediaBay** tags, for example.

#### Refresh

Refreshes the list. Use this if you have added tags to the presets in the **MediaBay**.

## Consistency Check

To avoid incomplete or nonfunctional libraries, the **Library Creator** performs several automatic checks when building libraries. As a first step, all presets are checked when they are added to a VST Sound container. If any issues are found, a red warning sign is shown in the **Issue** column of the corresponding preset, and a global warning sign is shown in the list of unassigned samples/VST Sound containers. Existing issues do not prevent the **Library Creator** from building the VST Sound container, however. They simply allow you to identify issues that you need to fix before releasing the library.

The **Library Creator** performs the following checks:

- HALion Sonic presets for which no macro page is assigned
- HALion Sonic presets for which no quick controls are assigned
- used audio formats (file type, sample rate, bit depth, channels)
- Sample markers that exist beyond the sample file end

- Sample markers that exist beyond the sample end in a zone
- Sample end markers that are placed before the start marker
- Empty sample, grain, and wavetable zones
- Samples that are not referenced by any presets
- Missing information for **Author**, **Category**, and **Sub-Category**
- **Character** tags that are not set
- Missing parameter **Signature** or **Tempo**
- Presets with identical names (case sensitive)
- An incorrect size for the macro page if it is to be used in HALion Sonic

When starting the library build process, the **Library Creator** may encounter additional issues, which can stop the build process. In this case, a report window opens and helps you to identify the cause of the failure. Common issues include leaving a mandatory field for defining the library properties blank, removing required resources from your file system after creating the library, so that they cannot be found, etc.

# Effects Reference

HALion comes with a collection of high-quality studio effects.

Many of the insert effects can also be used in surround configurations, that means, they process all channels. However, the legacy HALion 3 effects, Stereo Pan, Chorus, Flanger, Rotary, Vibrato, and Multi Delay only process the front left and right channels.

The effect menu contains submenus for the different effect types.

## Reverb Effects

The **REverb** submenu contains the reverb effects.

## REVerence

REVerence is a convolution tool that allows you to apply room characteristics (reverb) to the audio.

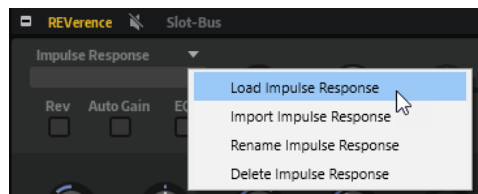


By recording an impulse in a room, you capture the characteristics of this room. Convolution superimposes these characteristics on the sound. The result is a very authentic reverb.

Included with this effect is a collection of high-quality reverb impulse responses, but you can also import your own files. The selected impulse response determines the basic sound character of the reverb.

### Import Impulse Response Pop-up Menu

This menu allows you to load, import, rename, and delete your own impulse response files. If you load a file, it becomes available in your current program. If you import a file, it is added to the impulse response subpresets and becomes globally available.



- **Load Impulse Response** allows you to browse to and select an impulse response file and load it. The supported formats are .wav and .aiff.

#### NOTE

On saving a program, multi preset, or a project, the reference path to the original impulse response file is saved, too.

- **Import Impulse Response** allows you to import one or multiple impulse response files.

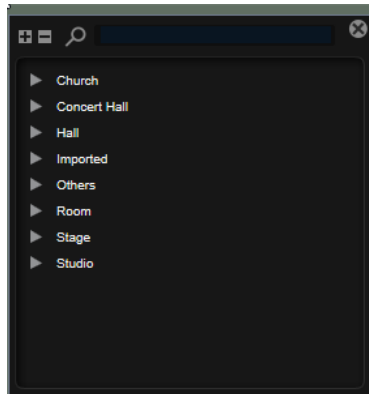
This creates a subpreset for each impulse response file in the user subpreset folder: Documents\Steinberg\HALion\Sub Presets\IRPresets\Imported. The sample files themselves are copied to the folder "IRSamples" within the subpreset folder. The new subpresets are available on the **Imported** submenu in the impulse response loader, like the factory content.

- **Rename Impulse Response** allows you to rename the impulse response subpreset.

If you rename a subpreset, the name of the associated sample file is modified accordingly.

**Delete Impulse Response** deletes the impulse response subpreset and the associated sample file.

#### Impulse Response Loader



The loader contains the factory impulse responses and the impulse response files that you imported.

#### Reverse

Reverses the impulse response.

#### Auto Gain

Normalizes the level of the impulse response files.

If you work with impulse response files that vary greatly in level, activate **Auto Gain** to ensure that the dry/wet mix sounds as expected.

#### Equalizer

Activates the built-in three-band equalizer.

#### Predelay

Determines the amount of time between the dry signal and the onset of the reverb. With higher **Predelay** values, you can simulate larger rooms.

#### Time

Controls the reverb time. With a setting of 100%, the impulse response is applied with its original length maintained.

### Size

Scales the size of the simulated room. With a setting of 100%, the impulse response is applied as recorded in the original room.

### Level

Adjusts the level of the impulse response.

### Equalizer

Activates the built-in three-band equalizer.

### ER/Tail Split

Sets the split point between the early reflections and the reverb tail.

### ER/Tail Mix

Sets the balance between the early reflections and the reverb tail. With a setting of 50% the early reflections and the tail have the same volume level. Settings below 50% raise the early reflections and lower the tail. As a result, the sound source moves towards the front of the room. Settings above 50% raise the tail and lower the early reflections. As a result, the sound source moves towards the back of the room.

## Reverb

This effect produces a high-quality algorithmic reverb with early reflections and reverb tail.



The early reflections are responsible for the spatial impression in the first milliseconds of the reverb. For emulating different rooms, you can choose from different early reflection patterns and adjust their size. The reverb tail, or late reverberation, offers parameters for controlling the room size and the reverb time. You can adjust the reverb time individually in three frequency bands.

### Predelay

Determines how much time passes before the reverb is applied. This allows you to simulate larger rooms by increasing the time it takes for the first reflections to reach the audience.

### Early Reflections

Allows you to select an early reflections pattern. The early reflections pattern contains the most important delays that deliver the key information for the spatial impression of the room.

### ER/Tail

Sets the level balance between the early reflections and the reverb tail. With a setting of 50%, early reflections and tail have the same volume. Settings below 50% raise the early reflections and lower the tail. As a result, the sound source moves towards the front of the room. Settings above 50% raise the tail and lower the early reflections. As a result, the sound source moves toward the back of the room.



### **Delay**

Delays the onset of the reverb tail.

### **Room Size**

Controls the dimensions of the simulated room. With a setting of 100%, the dimensions correspond to a cathedral or a large concert hall. With a setting of 50%, the dimensions correspond to a medium-sized room or studio. Settings below 50% simulate the dimensions of a small room or a booth.

### **Main Time**

Controls the overall reverb time of the tail. The higher this value, the longer the reverb tail will decay. With a setting of 100%, the reverb time is infinitely long. The **Main Time** parameter also represents the mid band of the reverb tail.

### **High Time**

Controls the reverb time for the high frequencies of the reverb tail. With positive values, the decay time of the high frequencies is longer. With negative values, it is shorter. Frequencies are affected depending on the **High Freq** parameter.

### **Low Time**

Controls the reverb time for the low frequencies of the reverb tail. Positive values result in a longer decay for the low frequencies. Negative values result in a shorter decay. Frequencies are affected depending on the **Low Freq** parameter.

### **High Freq**

Sets the cross-over frequency between the mid and the high band of the reverb tail. You can offset the reverb time for frequencies above this value from the main reverb time with the **High Time** parameter.

### **Low Freq**

Sets the cross-over frequency between the low and the mid band of the reverb tail. The reverb time for frequencies below this value can be offset from the main reverb time with the **Low Time** parameter.

### **Show Early Reflections Page/Show Chorus Page**

With these two buttons, you can choose whether to display the early reflections settings or the chorus settings in the lower left part of the effect panel.

### **ER Size**

Adjusts the length of the early reflections pattern. With a setting of 100%, the pattern is applied with its original length and the room sounds natural to the highest possible degree. With settings below 100%, the early reflections pattern is compressed, and the room is perceived as smaller.

### **Low Cut**

Attenuates the low frequencies of the early reflections. The higher this value, the fewer low frequencies are present in the early reflections.

### **High Cut**

Attenuates the high frequencies of the early reflections. The lower this value, the fewer high frequencies are present in the early reflections.

### **Shape**

Controls the attack of the reverb tail. With a setting of 0%, the attack is more immediate, which is a suitable setting for drums. The higher this value, the less immediate the attack.

### Density

Adjusts the echo density of the reverb tail. With a setting of 100%, single reflections from walls cannot be heard. The lower this value, the more audible the single reflections.

### Tail High Cut

Attenuates the high frequencies of the reverb tail. The lower this value, the fewer high frequencies are present in the reverb tail.

### Width

Adjusts the output of the reverb signal between mono and stereo. With a setting of 0%, the output of the reverb is mono. At 100%, it is stereo.

### Mix

Sets the ratio between the dry and the wet signal.

## Chorusing

Chorusing allows you to enrich the reverb tail through subtle pitch modulations. To access the chorusing parameters, click the **Show Chorusing Page** button.



### Chorusing On/Off

Activates/Deactivates the chorusing effect.

### Chorusing Rate

Specifies the frequency of the pitch modulation.

### Chorusing Depth

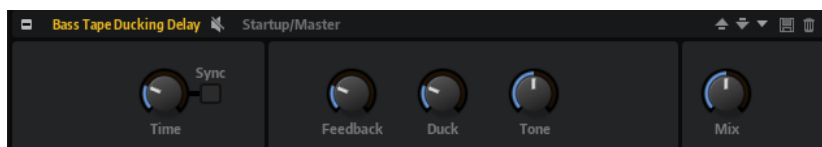
Sets the intensity of the pitch modulation.

## Delay Effects

The **Delay** submenu contains the delay effects.

### Bass Tape Ducking Delay

Bass Tape Ducking Delay provides a delay that follows the level of the input signal. The effect portion of the signal is then lowered for high input signals and raised for low input signals. This serves to keep the delayed signal rather dry during loud or intensely played passages.



### Time

Controls the time it takes for the effect to adapt to changes in the input level.

### Sync

Allows you to synchronize the delay time to the host tempo. If **Sync** is activated, you can set the **Delay** value in fractions of beats.

### Delay

Sets the delay time in milliseconds.

### Feedback

The higher this setting, the more delay repeats are created.

### Duck

Works like an automatic mix parameter. If the level of the input signal is high, the portion of the effect signal is lowered, or ducked (low internal mix value). If the level of the input signal is low, the portion of the effect signal is raised (high internal mix value). This way, the delayed signal stays rather dry during loud or intensely played passages.

### Tone

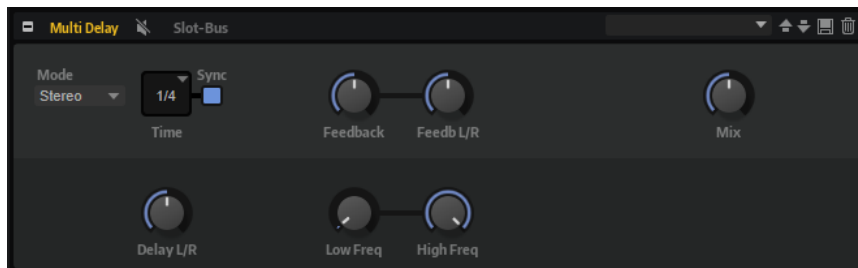
Allows you to attenuate the low frequencies.

### Mix

Sets the ratio between the dry and the wet signal.

## Multi Delay

This effect produces delays, with adjustable time, feedback, and filters.



### Delay Mode

- **Stereo** has two delays in parallel, one for the left and one for the right audio channel, each with a feedback path of its own.
- **Cross** has two delay lines with cross feedback, where the delay of the left channel is fed back into the delay of the right channel, and vice versa.
- **Ping-Pong** mixes the left and right input channels and sends the mixed signal to hard-panned left and right delays. This way, the echoes bounce from left to right, like a ping-pong ball, in the stereo panorama.

### Delay Time

Sets the overall time for the left and right delay. Use the **Delay L/R** parameter to shorten the time for the left or right delay.

### Sync

Allows you to synchronize the delay time to the host tempo. If **Sync** is activated, the time is set as a note value.

**NOTE**

The maximum delay time is 5000 ms. If the note length exceeds this value, it is automatically shortened.

---

**Delay L/R**

Offsets the time of the left or right delay from the overall delay time. At a factor of 1, the right or left delay time has the same length as the overall delay time. At a factor of 0.5, the time is half as long as the overall delay time.

- To offset the left delay time, turn the control to the left.
- To offset the right delay time, turn the control to the right.

**Feedback**

Sets the overall amount of feedback for the left and right delay. Feedback means the output of the delay is fed back to its input. Set to 0%, you hear only one echo. With a setting of 100%, the echoes are continuously repeated.

**Feedback L/R**

Offsets the amount of feedback of the left or right delay from the overall feedback. A factor of 1 means that the amount of feedback corresponds to the overall feedback. A factor of 0.5 means that the amount is half the overall feedback.

- To offset the left feedback, turn the control to the left.
- To offset the right feedback, turn the control to the right.

**NOTE**

This parameter is only available in **Stereo** mode.

---

**High Freq**

Attenuates the high frequencies of the delays.

**Low Freq**

Attenuates the low frequencies of the delays.

**Mix**

Sets the ratio between the dry and the wet signal.

## EQ Effects

The **EQ** submenu contains the equalizer effects.

## Studio EQ

Studio EQ is a high-quality 4-band parametric equalizer.



With the four frequency bands, you can shape the tone color, to create a brighter or darker sound, for example. The two mid-range bands act as peak filters, and the low and high bands act as shelving filters. All bands are fully parametric with adjustable gain, frequency, and Q factor. Each frequency band offers the following controls:

Click one of the numbered buttons to show the settings for the corresponding frequency band. The two mid-range bands act as peak filters, and the low and high bands act as shelving filters. Each frequency band offers the following controls:

**On/Off**

Activates/Deactivates the corresponding frequency band.

**Gain**

Sets the amount of cut or boost for the corresponding band.

**Freq**

Sets the frequency that is cut or boosted with the **Gain** parameter.

**Q (Quality)**

Adjusts the bandwidth of the mid-range peak filters from wide to narrow. By increasing the **Q** value on the low and high shelving filters, you can add a dip to their shape.

- To adjust the **Gain** and **Freq** parameters simultaneously, drag the points in the EQ curve display.

The buttons to the left and the right of the numbered buttons allow you to show the settings for the low-cut and the high-cut filter, respectively. For these filters, the following parameters are available:

**Low-Cut On/Off**

Activates/Deactivates the low-cut filter.

**High-Cut On/Off**

Activates/Deactivates the high-cut filter.

**Slope**

Sets the slope for the filter. You can choose from 6, 12, 24, 36, and 48 dB per octave.

**Freq**

Sets the frequency for the filter.

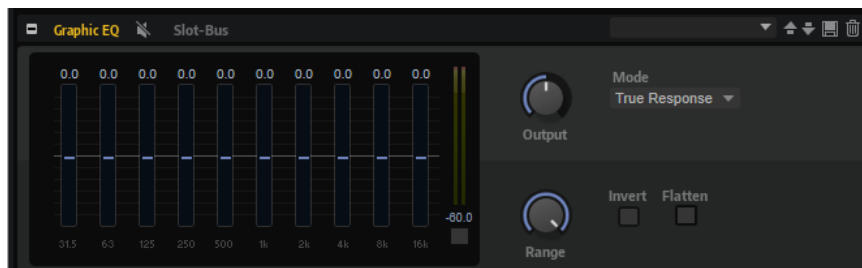
**Output meter**

Allows you to monitor the output level. The peak level is shown below the meter.

To reset the peak level, click **Reset Output Peak Level** below the meter.

## Graphic EQ

Graphic EQ is an equalizer with ten frequency bands that can be cut or boosted by up to 12 dB. In addition, you can specify the overall range and output of the equalizer.



### Output

Controls the overall output level of the equalizer.

### Mode

Allows you to add color or character to the equalized output. The following options are available:

- **True Response** mode uses serial filters with accurate frequency response.
- **Classic** mode uses parallel filters whose resonance depends on the amount of gain.
- **Constant Q** mode uses parallel filters whose resonance is raised when boosting the gain.

### Range

Adjusts the maximum cut or boost for all frequency bands together.

### Invert

Inverts the EQ curve.

### Flatten

Resets all frequency bands to 0 dB.

## DJ-EQ

DJ-EQ is an easy-to-use 3-band parametric equalizer that resembles the EQs found on typical DJ mixers. This plug-in is designed for quick sound fixes.



### Low Freq/Mid Freq/High Freq

Set the amount of boost or attenuation for the low, mid, and high bands. You can also click and drag in the display to change these values.

### Low Cut/Mid Cut/High Cut

Cut the low, mid, and high bands.

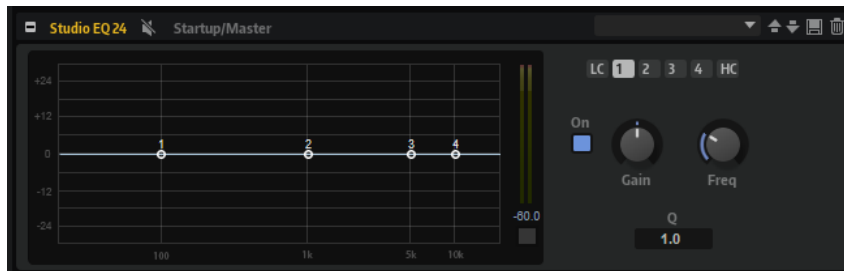
### Reset Output Peak Level

Resets the peak level that is displayed in the output meter.

## Studio EQ 24

This high-quality 4-band parametric equalizer allows you to shape the tone color, to create a brighter or darker sound, for example. All bands are fully parametric with adjustable **Gain**,

**Frequency**, and **Quality** parameters. Furthermore, you can add a high-cut and a low-cut filter and edit their settings.



Click one of the numbered buttons to show the settings for the corresponding frequency band. The two mid-range bands act as peak filters, and the low and high bands act as shelving filters. Each frequency band offers the following controls:

#### On/Off

Activates/Deactivates the corresponding frequency band.

#### Gain

Sets the amount of cut or boost for the corresponding band.

#### Freq

Sets the frequency that is cut or boosted with the **Gain** parameter.

#### Q (Quality)

Adjusts the bandwidth of the mid-range peak filters from wide to narrow. By increasing the **Q** value on the low and high shelving filters, you can add a dip to their shape.

The buttons to the left and the right of the numbered buttons allow you to show the settings for the low-cut and the high-cut filter, respectively. For these filters, the following parameters are available:



#### Low-Cut On/Off

Activates/Deactivates the low-cut filter.

#### High-Cut On/Off

Activates/Deactivates the high-cut filter.

#### Slope

Sets the slope for the filter. You can choose from 6, 12, 24, 36, and 48 dB per octave.

#### Freq

Sets the frequency for the filter.

#### Output meter

Allows you to monitor the output level. The peak level is shown below the meter.

To reset the peak level, click **Reset Output Peak Level** below the meter.

## Filter Effects

The **Filter** submenu contains the filter effects.

### Auto Filter

Auto Filter provides two morphable filter shapes with distortion.



Morphing between the two shapes, as well as the cutoff, can be controlled with a manual pedal control, an LFO, or an envelope follower.

### Filter Parameters

#### Filter Shape

- LP24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP12 and BP24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP6 + LP18 and HP6 + LP12 are a combination of a high-pass filter with 6 dB/oct and a low-pass filter with 18 and 12 dB/oct, respectively (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies above the cutoff.
- HP12 + LP6 and HP18 + LP6 are a combination of a high-pass filter with 12 and 18 dB/oct and a low-pass filter with 6 dB/oct (asymmetric band-pass filter). Frequencies below and above the cutoff are attenuated. Attenuation is more pronounced for the frequencies below the cutoff.
- HP24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR12 and BR24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR12 + LP6 and BR12 + LP12 are a combination of a band-reject filter with 12 dB/oct and a low-pass filter with 6 and 12 dB/oct, respectively. Frequencies around and above the cutoff are attenuated.
- BP12 + BR12 is a band-pass filter with 12 dB/oct plus a band-reject filter with 12 dB/oct. Frequencies below, above, and around the cutoff are attenuated.
- HP6 + BR12 and HP12 + BR12 are a combination of a high-pass filter with 6 and 12 dB/oct and a band-reject filter with 12 dB/oct. Frequencies below and around the cutoff are attenuated.
- AP is an all-pass filter with 18 dB/oct. Frequencies around the cutoff are attenuated.
- AP + LP6 is an all-pass filter with 18 dB/oct plus a low-pass filter with 6 dB/oct. Frequencies around and above the cutoff are attenuated.



- HP6 + AP is a high-pass filter with 6 dB/oct plus an all-pass filter with 18 dB/oct. Frequencies around and below the cutoff are attenuated.

### Input

Adjusts the gain before the filter and distortion. This parameter only affects the wet signal.

### Cutoff

Specifies the cutoff frequency of the filter.

### Resonance

Emphasizes the frequencies around the cutoff. At higher resonance settings, the filter self-oscillates, which results in a ringing tone.

### Distortion Type

The following options are available:

- When this parameter is set to **Off**, the filter offers no distortion.
- **Tube Drive** adds warm, tube-like distortion.
- **Hard Clip** adds bright, transistor-like distortion.
- **Bit Red** adds digital distortion by means of quantization noise.
- **Rate Red** adds digital distortion by means of aliasing.

### Distortion

Adds distortion to the signal. The effect depends on the selected distortion type. With higher settings, it creates a very intense distortion effect.

#### NOTE

This parameter is not available if **Distortion Type** is set to **Off**.

---

### Output

Adjusts the gain after the filter and distortion. This parameter only affects the wet signal.

### Mix

Sets the ratio between the dry and the wet signal.

## LFO Section

### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.

- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

#### **Freq**

Determines the frequency of the cutoff modulation.

#### **Sync**

Allows you to synchronize the effect to the host application. If **Sync** is activated, you can set the **Freq** parameter in fractions of beats.

#### **Depth**

Determines the output level of the LFO modulation signal.

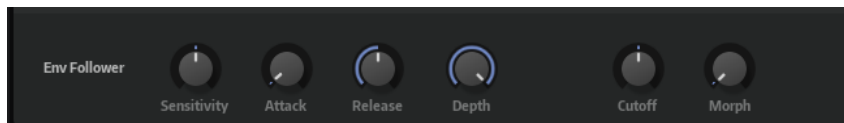
#### **Cutoff**

Determines the modulation intensity of the LFO on the filter cutoff.

#### **Morph**

Determines the modulation intensity of the LFO on the filter morph.

### **Envelope Follower Section**



The Envelope Follower traces the input signal with an adjustable attack and release time and delivers a modulation signal representing the level envelope of the signal.

#### **Sensitivity**

All input signals are mixed down to mono before they are sent to the Envelope Follower. This parameter sets the optimum input level for the Envelope Follower.

#### **Attack**

Adjusts the attack time, that is, the time the Envelope Follower needs to approach increasing input levels.

#### **Release**

Adjusts the release time, that is, the time the Envelope Follower needs to approach decreasing input levels.

#### **Depth**

Determines the output level of the modulation signal of the Envelope Follower.

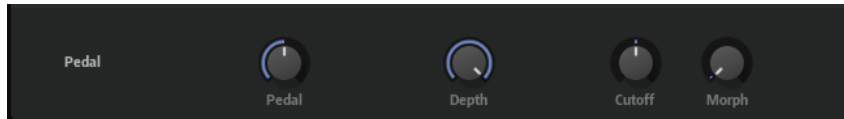
#### **Cutoff**

Determines the modulation intensity of the Envelope Follower on the filter cutoff.

#### **Morph**

Determines the modulation intensity of the Envelope Follower on the filter morph.

## Pedal Section



### Pedal

Sets the position of the pedal.

### Depth

Determines the output level of the pedal modulation signal.

### Cutoff

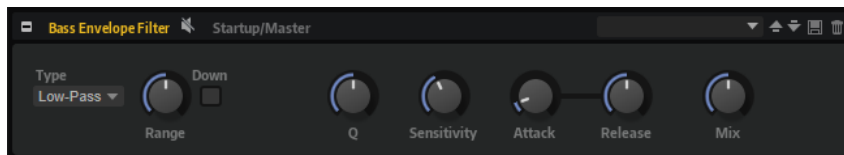
Determines the modulation intensity of the pedal on the filter cutoff.

### Morph

Determines the modulation intensity of the pedal on the filter morph.

## Bass Envelope Filter

Bass Envelope Filter allows you to filter out the high, low, or middle frequencies of the audio. The effect has an adjustable **Attack** and **Release** time and delivers a modulation signal representing the level envelope of the signal that is used to control the filter cutoff frequency.



### Type

Sets the filter type. You can choose between **Low-Pass**, **Band-Pass**, and **High-Pass**.

### Range

Determines the frequency range.

### Down

Inverts the direction of the envelope filter modulation, that is, higher levels lower the filter cutoff.

### Q-Factor

Sets the intensity of the envelope filter effect.

### Sensitivity

Determines how sensitively the effect reacts to the instrument level.

### Attack

Determines how quickly an effect reacts to the input signal.

### Release

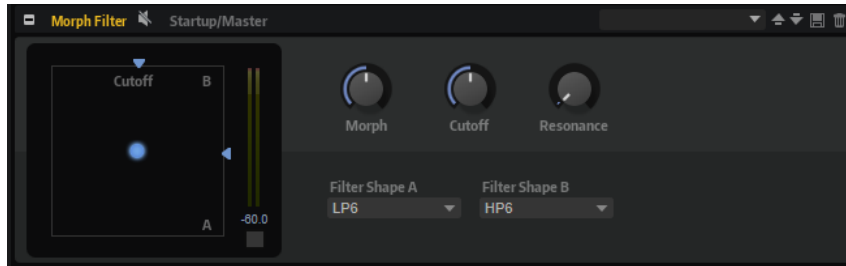
Determines how quickly the effect fades out after the input signal stops.

### Mix

Sets the ratio between the dry and the wet signal.

## Morph Filter

Morph Filter allows you to mix low-pass and high-pass filter effects, allowing for creative morphings between two filters. You can specify the filter shapes for filter shape A and B individually.



### Filter Shape B

Allows you to choose from several high-pass and band-rejection filter shapes.

### Filter Shape A

Allows you to select a low-pass or a band-pass filter shape.

### Morph

Allows you to mix the output between the two selected filters.

### Cutoff

Adjusts the cutoff frequency of the filters.

#### NOTE

You can also set the **Cutoff** and **Morph** parameters simultaneously by clicking in the display and dragging.

---

### Resonance

Emphasizes the frequencies around the cutoff frequency. For an electronic sound, increase the resonance. At higher resonance settings, the filter self-oscillates, which results in a ringing tone.

## Resonator

The Resonator effect comes with 14 predefined filter shapes that determine the basic sound character. In addition to this, three LFOs can be used to modulate each filter individually, which allows for adding extra motion to the sound.

The sound of the human voice or of acoustic instruments is characterized by distinctive formant regions, that is, by resonances in the frequency spectrum that are typical for a particular sound. For example, the vowel “ah” (as in father) sung by a male singer has three characteristic formants:  $F1 = 570$  Hz,  $F2 = 840$  Hz, and  $F3 = 2410$  Hz. The Resonator effect allows you to induce such formant regions to a sound by using three filters that are connected in parallel. You can specify the positions and levels of the formant regions by adjusting the **Cutoff**, **Resonance**, and **Gain** parameters of the filters.

### Resonator Shape

Defines the basic sound character of the effect. Each shape is a unique combination of different filter types for the low, mid, and high frequency bands.

Option	Filter Low/Mid/High
Low-Pass 1	LP6/LP6/LP6
Low-Pass 2	LP12/LP12/LP12
Band-Pass 1	BP12/(-1)BP12/BP12*
Band-Pass 2	BP12/BP12/BP12
High-Pass 1	HP6/HP6/HP6
High-Pass 2	HP12/HP12/HP12
Peak 1	LP6/(-1)BP12/HP6*
Peak 2	LP6/BP12/HP6
Bat 1	HP12/BP12/LP12
Bat 2	HP6/BP12/LP6
Wings 1	LP6/BR12/HP6
Wings 2	HP12/BR12/LP12
Wings 3	LP6/(-1)BR12/HP6*
Wings 4	HP12/(-1)BR12/LP12*

\*(-1) means that the phase is inverted

### Mix

Sets the ratio between the dry and the wet signal.

### Cutoff Spread

Spreads the cutoff frequencies between the channels of the effect.

For example, if the effect is used in stereo, positive **Cutoff Spread** values shift the cutoff down on the left channel and up on the right channel.

## Filter Page



### Cutoff

Adjusts the cutoff frequency of the filter, that is, the center frequency of the formant region.

### Resonance

Adjusts the resonance of the filter. The resonance determines how much the formant region is emphasized. With higher settings, the filter self-oscillates, which results in a ringing tone.

### Gain

Adjusts the input gain of the filter. The gain determines the level of the formant region.

### LFO Modulation Source

Allows you to select the LFO that modulates the cutoff.

### LFO Modulation Depth

Adjusts the cutoff modulation of the LFO.

## LFO Page



### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Spread

For each channel of the effect, there is a separate LFO signal. This parameter spreads the phase of the LFO signals across the different channels.

For example, if the effect is used in stereo, positive values shift the LFO phase forward on the left channel and backward on the right channel.

### Sync

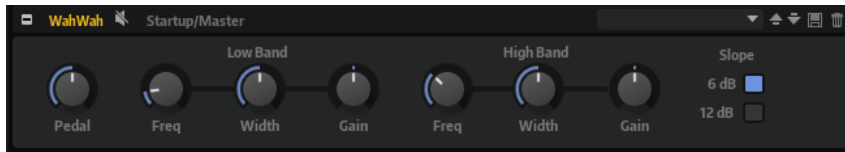
Allows you to set the **Freq** parameter in fractions of beats.

### Freq

Determines the frequency of the cutoff modulation.

## WahWah

WahWah is a variable slope band-pass filter modeling the well-known analog pedal effect.



You can specify the frequency, width, and the gain for the low and high pedal positions. The crossover point between the low and high pedal positions lies at 50.

### Pedal

Controls the filter frequency sweep.

### Low Band

- **Freq** determines the frequency of the filter for the low pedal position.
- **Width** determines the width (resonance) of the filter for the low pedal position.
- **Gain** determines the gain of the filter for the low pedal position.

### High Band

- **Freq** determines the frequency of the filter for the high pedal position.
- **Width** determines the width (resonance) of the filter for the high pedal position.
- **Gain** determines the gain of the filter for the high pedal position.

### Slope

Allows you to choose between two filter slope values: 6 dB or 12 dB.

## Distortion Effects

The **Distortion** submenu contains the distortion effects.

## Amplifier

This effect emulates the sound of an amplifier with speakers.



There are different amplifiers and speaker models you can combine.

### Amp Model

Specifies the amplifier type. The sound character of the overdrive changes with the amplifier. To bypass the amp modeling, select **No Amplifier**.

### Speaker Model

Determines the speaker model type. Each model colors the sound in a unique way. To bypass the model, select **No Speaker**.

**Drive**

Adjusts the amount of overdrive.

**Bass**

Adjusts the tone color of the low frequencies.

**Middle**

Adjusts the tone color of the mid frequencies.

**Treble**

Adjusts the tone color of the high frequencies.

**Presence**

Adjusts the brightness of the sound.

**Low Damp**

Attenuates the low frequencies of the speakers.

**High Damp**

Attenuates the high frequencies of the speakers.

**Channel Mode**

Defines which output channels of the amplifier deliver a distorted signal. You can set it to **L** (Left), **R** (Right) or **L/R** (Both). When set to **L** or **R**, the other channel provides a clean signal.

**Output**

Controls the output level of the amplifier.

## Bass DI Driver



**Level**

Sets the output level.

**Drive**

Sets gain and overdrive.

**Blend**

Blends between normal and tube emulation circuitry.

With **Blend** at 0, **Drive** and **Presence** are not active.

**Bass**

Boosts or attenuates low frequencies.

**Treble**

Boosts or attenuates high frequencies.

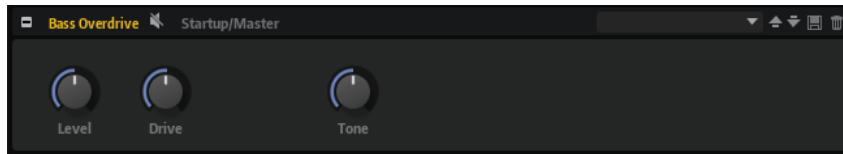
**Presence**

Boosts or attenuates upper frequencies and attacks.



## Bass Overdrive

Bass Overdrive creates a tube-like overdrive effect.



### Level

Adjusts the output level.

### Drive

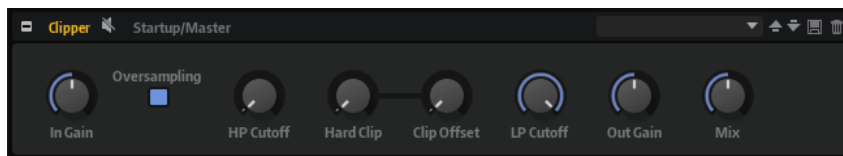
The higher this value, the more harmonics are added to the output signal of this effect.

### Tone

Acts as a filter effect on the added harmonics.

## Clipper

This effect adds bright, harmonic distortion to the sound.



### Input Gain

Adjusts the input level of the distortion.

### Oversampling

Increases the accuracy of the effect.

### High-Pass Cutoff

High-pass filter with 6 dB/oct. Frequencies below the cutoff are attenuated.

### Hard Clip

Adds distortion to the signal.

### Hard Clip Offset

Allows you to produce odd harmonics and even harmonics. The higher the setting, the more even harmonics are produced.

### Low-Pass Cutoff

Low-pass filter with 6 dB/oct. Frequencies above the cutoff are attenuated.

### Output Gain

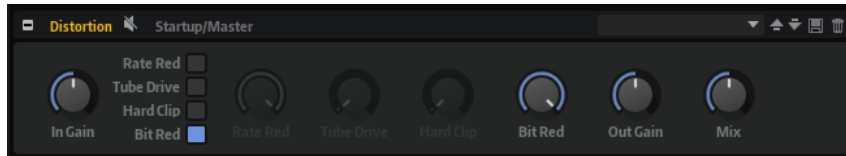
Adjusts the output level of the distortion.

### Mix

Sets the ratio between the dry and the wet signal.

## Distortion

This effect offers the whole range of distortion, from low fidelity, digital distortion to high fidelity, analog sounding distortion. The available distortion types (**Rate Red**, **Tube Drive**, **Hard Clip**, and **Bit Red**) can be freely combined.



### In Gain

Adjusts the input level of the sound.

### Rate Red (Rate Reduction)

Rate reduction distorts the sound by means of aliasing. Enable the **Rate Red** option to activate the control that adjusts the amount of aliasing. The lower the setting, the more aliasing is added.

### Tube Drive

Adds warm, tube-like distortion to the sound. Enable the **Tube Drive** option to activate the control that adjusts the amount of distortion. The higher the setting, the more distortion is added.

### Hard Clip

Adds bright, transistor-like distortion to the sound. Enable the **Hard Clip** option to activate the control that adjusts the amount of distortion. The higher the setting, the more distortion is added.

### Bit Red (Bit Reduction)

Bit reduction distorts the sound by means of quantization noise. If **Bit Red** is activated, you can adjust the amount of quantization noise. The lower the setting, the more quantization noise is added.

### Out Gain

Adjusts the output level of the sound.

### Mix

Sets the ratio between the dry and the wet signal.

## VST Amp

This effect emulates the sound of an amplifier with speakers. There are different amplifiers and speaker models you can combine.



### Amp Model

Specifies the amplifier type. The sound character of the overdrive changes with the amplifier. To bypass the amp modeling, select **No Amplifier**.

### Speaker Model

Specifies the speaker model type. Each model colors the sound uniquely. To bypass the speaker modeling, select **No Cabinet**.

### Drive

Adjusts the amount of overdrive.

### Bass

Adjusts the tone color of the low frequencies.

### Treble

Adjusts the tone color of the high frequencies.

### Presence

Adjusts the brightness of the sound.

### Mic Type

You can choose between two microphone types. If this control is set to 0%, a large-diaphragm condenser microphone is used. At 100%, you obtain a dynamic microphone. Settings in between allow you to fade between the characteristics of these two microphones.

### Microphone Position

Allows you to choose from seven positions to place the microphone. These positions result from two different angles (center and edge) and three different distances from the speaker, as well as an additional center position at an even greater distance from the speaker.

### Channel Mode

Determines in which way the two input channels are distorted.

- **L** applies the effect to the left input channel only. The right channel remains clean and unprocessed.
- **R** applies the effect to the right input channel only. The left channel remains clean and unprocessed.
- **L+R** sums the two input channels into a mono signal and applies the effect to this signal.
- **Stereo** applies the effect to the two input channels.

#### NOTE

The **L** and **R** modes allow you to use two instances of the effect to process the left and the right channel individually using different effect settings.

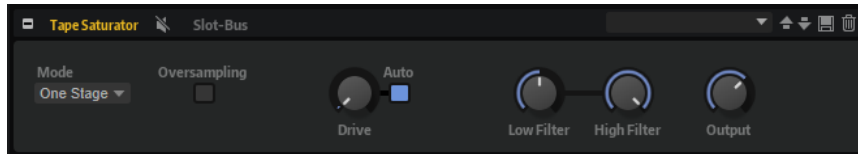
---

### Output

Controls the output level of the amplifier.

## Tape Saturator

Tape Saturator simulates the behavior of classic tape recorders. These machines produced a specific saturation when recording higher input levels, which led to a compressed signal with light distortion.



### Mode

Allows you to choose between the effect of a single tape machine (**One Stage**) or two cascaded tape machines (**Two Stage**).

**Two Stage** mode leads to higher saturation and compression.

### Oversampling

Increases the accuracy of the effect by oversampling.

#### NOTE

If this parameter is activated, the effect requires more processing power.

---

### Drive

Determines the level of the input signal and thus the amount of saturation.

### Auto Gain

Results in automatic level compensation.

### Low Filter

Allows you to adjust the low frequency range below 1000 Hz by +/- 3 dB.

### High Filter

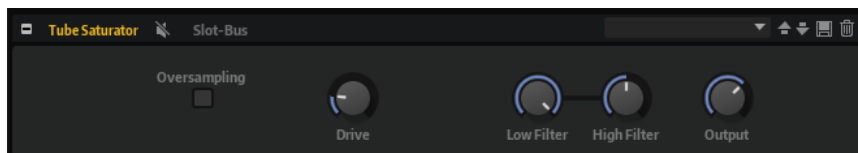
Allows you to attenuate the high frequency range. This high-cut filter works with a slope of 24 dB/octave.

### Output

Determines the level of the output signal.

## Tube Saturator

This effect enriches the sound by adding the characteristic harmonics of a saturated tube to the audio signal.



### Oversampling

Increases the accuracy of the effect by oversampling.

#### NOTE

If this parameter is activated, the effect requires more processing power.

---

### Drive

Determines the level of the input signal and thus the amount of saturation.

### Low Filter

Allows you to reduce the low frequency range by up to 6 dB before saturation.

### High Filter

Allows you to adjust the high frequency range by +/- 6 dB before saturation.

### Output

Determines the level of the output signal.

## VST Bass Amp

This bass amplifier comes with six different amplifier emulations and four different speaker cabinet emulations that you can freely combine.



You can select your amplifier/cabinet combination using the **Amp Model** and **Speaker Model** pop-up menus.

### Amp Model

The amplifiers available on the **Amp Model** pop-up menu are modeled on real-life amplifiers. Each amp features settings typical for bass recording, such as gain, equalizers, and master volume. The sound-related parameters bass, low mid, high mid, and treble have a significant impact on the overall character and sound of the corresponding amp.

- **Valve Amp 300** is a famous tube amplifier from the 70s. It is suitable for rock playing styles.
- **Greyhound** is well known for its typical growl. It is suitable for several playing styles.
- **Green T** is a classic amplifier from the 80s. It is suitable for funk and rock playing styles.
- **Paradise** is an amplifier from the 90s with a hifi-like clear tone that makes it applicable for several styles.
- **Tweed** is a classic vintage amplifier from the 50s with a characterful and bright tone.
- **iTech** is a modern amplifier with a universal sound.

### Speaker Model

The cabinets available on the **Speaker Model** pop-up menu simulate real-life combo boxes or speakers.

- **4x10** emulates four 10" speakers. These speakers provide a punchy, clear sound that is suitable for "slap" bass and regular playing styles.
- **8x10** emulates the sound of eight 10" speakers.

- **4x12** emulates the sound of four 12" speakers. These speakers provide a mellow and full sound, making them a good choice between 10" and 15" speakers.
- **1x15** emulates the sound of a 15" speaker. These speakers provide more low frequencies, compared to the other models. They are suitable for rock and vintage-oriented styles.

### **Shape 1/Shape 2**

Offer predefined tone shaping.

### **Gain**

Sets the amount of boost for the amp.

### **Bass**

Allows you to raise or lower the low frequency part of the signal.

### **Low Middle Frequency**

Allows you to raise or lower the low-mid frequency part of the signal.

### **Low Middle Gain**

Sets the amount of boost for the low-mid frequency part of the signal.

### **High Middle Frequency**

Allows you to raise or lower the high-mid frequency part of the signal.

### **High Middle Gain**

Sets the amount of boost for the high-mid frequency part of the signal.

### **Treble**

Allows you to raise or lower the high frequency part of the signal.

### **Microphone Mix**

Set this control entirely to the left or right to use either microphone 1 or microphone 2, or choose a position in between to blend the two types together.

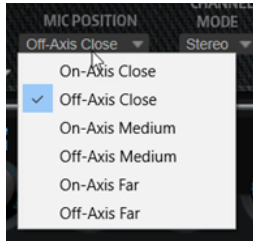
### **Microphone 1 Type/Microphone 2 Type**

On these pop-up menus, you can choose from different microphone types.

- **57** is a dynamic microphone with cardioid pickup pattern.
- **121** is a ribbon microphone with figure-8 pattern.
- **409** is a dynamic microphone with supercardioid pickup pattern.
- **421** is a dynamic microphone with cardioid polar pattern.
- **545** is a dynamic microphone with cardioid pattern that minimizes feedback.
- **5** is a dynamic microphone with cardioid pickup pattern.
- **30** is a reference and measurement microphone with omnidirectional polar pattern.
- **87** is a condenser microphone with omnidirectional pattern.

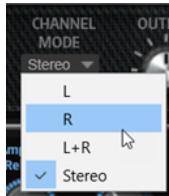
### **Microphone Position**

Allows you to choose between off-axis and on-axis microphone positions at three different distances from the speaker.



### Channel Mode

Allows you to select the channel configuration for the effect.



- **L** applies the effect to the left input channel only. The right channel remains clean and unprocessed.
- **R** applies the effect to the right input channel only. The left channel remains clean and unprocessed.
- **L+R** sums the two input channels into a mono signal and applies the effect to this signal.
- **Stereo** applies the effect to the two input channels.

#### NOTE

The **L** and **R** modes allow you to use two instances of the effect to process the left and the right channel individually using different effect settings.

### Output Level

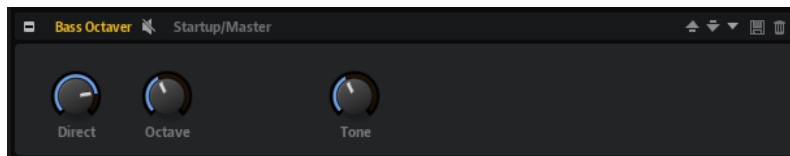
Sets the overall output level of the effect.

## Pitch Shift Effects

The **Pitch Shift** submenu contains the pitch shifting effects.

### Bass Octaver

Bass Octaver allows you to create an additional voice that follows the original voice an octave below. This effect is best suited for monophonic signals.



#### Direct

Adjusts the level of the original signal. A value of 0 means only the generated and transposed signal is heard. By raising this value, more of the original signal is heard.

### Octave

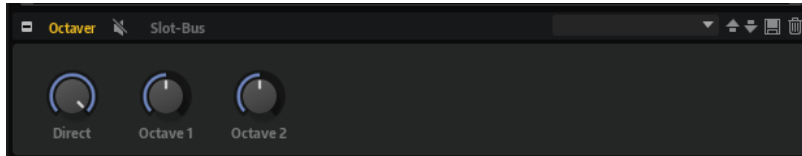
Adjusts the level of the signal that is generated one octave below the original pitch. A setting of 0 means that the voice is muted.

### Tone

Changes the sound character of the generated signal.

## Octaver

Octaver allows you to create two additional voices that follow the original voice an octave below and above. This effect is best suited for monophonic signals.



### Direct

Determines the level of the input signal.

### Octave 1

Determines the level of the signal that is produced an octave below the original voice.

### Octave 2

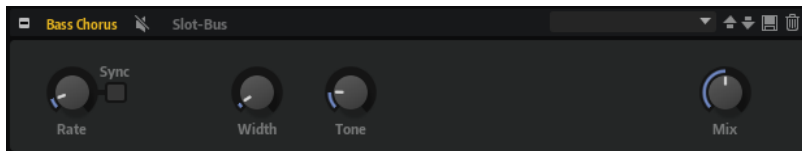
Determines the level of the signal that is produced an octave above the original voice.

## Modulation Effects

The **Modulation** submenu contains the modulation effects.

## Bass Chorus

This effect thickens and broadens the sound by means of pitch modulation.



### Rate

Allows you to specify the frequency of the pitch modulation in Hertz.

### Sync

Allows you to synchronize the effect to the host application. If **Sync** is activated, you can set the **Rate** value in fractions of beats.

### Width

Determines the depth of the chorus effect. Higher settings produce a more pronounced effect.

### Tone

Allows you to attenuate low frequencies.

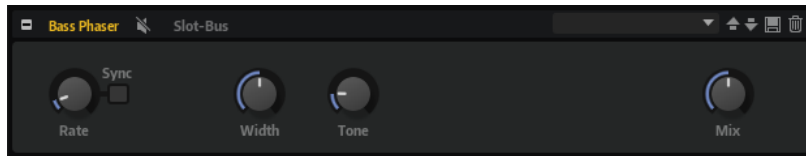
### Mix

Sets the ratio between the dry and the wet signal.



## Bass Phaser

Bass Phaser thickens and broadens the sound by means of phase modulation.



### Rate

Allows you to set the sweep rate. This parameter can be synchronized to the project tempo.

### Sync

Allows you to synchronize the effect to the host application. If **Sync** is activated, you can set the **Rate** value in fractions of beats.

### Width

Determines the width of the modulation effect between higher and lower frequencies.

### Tone

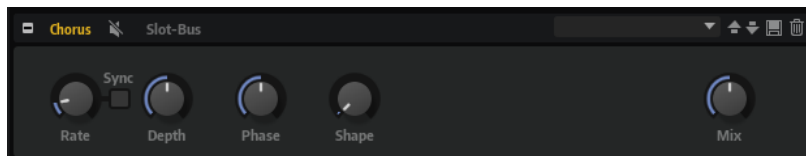
Allows you to attenuate the low frequencies.

### Mix

Sets the ratio between the dry and the wet signal.

## Chorus

Chorus thickens and broadens the sound by means of pitch modulation.



### Rate

Allows you to specify the frequency of the pitch modulation in Hertz.

### Sync

Allows you to set the **Rate** value in fractions of beats.

### Depth

Sets the intensity of the pitch modulation.

### Phase

Widens the sound image of the effect from mono to stereo.

### Shape

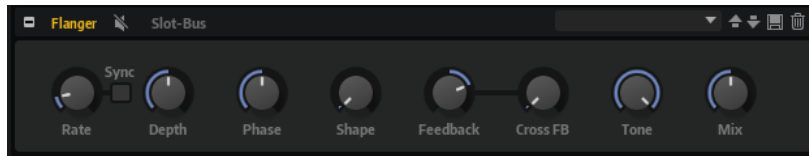
Adjusts the characteristics of the modulation. With a setting of 0%, the pitch changes continuously, producing a steady modulation. With a setting of 100%, the pitch does not change all the time, producing a less steady modulation.

### Mix

Sets the ratio between the dry and the wet signal.

## Flanger

This effect thickens and broadens the sound by means of pitch modulation.



### Rate

Allows you to specify the frequency of the pitch modulation in Hertz.

### Sync

Allows you to set the **Rate** value in fractions of beats.

### Depth

Sets the intensity of the pitch modulation.

### Phase

Widens the sound image of the effect from mono to stereo. This parameter also changes the characteristics of the **Cross FB** parameter.

### Shape

Adjusts the characteristics of the modulation. This is particularly noticeable when **Feedback** is activated. With a setting of 0%, the sound sweeps linearly up and down. With a setting of 100%, the sound sweeps exponentially up and down.

### Mix

Sets the ratio between the dry and the wet signal.

### Feedback

Adds resonances to the effect. This allows for jet-like sweeps of the sound.

### Cross FB

Mixes the feedback of the left channel with the right channel, and vice versa. The effect of this parameter is influenced by the **Phase** parameter.

### NOTE

This parameter only takes effect if the **Feedback** parameter is set to a value above 0%.

### Tone

Adjusts the tone color of the feedback. At lower values, the feedback is less bright.

## Step Flanger

The Step Flanger expands the Flanger with a “sample and hold” section that divides the modulation signal into a definable number of steps.



**Rate**

Allows you to specify the frequency of the pitch modulation in Hertz.

**Sync**

Allows you to set the **Rate** value in fractions of beats.

**Depth**

Sets the intensity of the pitch modulation.

**Phase**

Widens the sound image of the effect from mono to stereo. This parameter also changes the characteristics of the **Cross FB** parameter.

**Shape**

Adjusts the characteristics of the modulation. This is particularly noticeable when **Feedback** is activated. With a setting of 0%, the sound sweeps linearly up and down. With a setting of 100%, the sound sweeps exponentially up and down.

**Mix**

Sets the ratio between the dry and the wet signal.

**Feedback**

Adds resonances to the effect. This allows for jet-like sweeps of the sound.

**Cross FB**

Mixes the feedback of the left channel with the right channel, and vice versa. The effect of this parameter is influenced by the **Phase** parameter.

NOTE

This parameter only takes effect if the **Feedback** parameter is set to a value above 0%.

---

**Tone**

Adjusts the tone color of the feedback. At lower values, the feedback is less bright.

**Type**

Defines the length of the delay line that is modulated. **Short** produces a sharper flanger effect, and **Long** produces a less defined, more blurred flanger sound.

**S&H Mix**

Blends the normal modulation signal with the stepped modulation signal. At 100%, only the stepped modulation is used.

**Smooth**

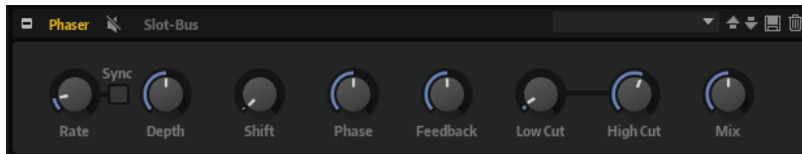
Creates ramps between the steps. This way, the stepped modulation signal sounds smoother.

**Steps**

Determines into how many steps the modulation signal is divided. You can use up to 32 steps.

## Phaser

The Phaser effect thickens and broadens the sound by means of phase modulation.



### Rate

Specifies the frequency of the phase modulation.

### Sync

Allows you to set the **Rate** value in fractions of beats.

### Depth

Sets the intensity of the phase modulation.

### Shift

Shifts the phase modulation upwards to higher frequencies of the spectrum.

### Phase

Widens the sound image of the effect from mono to stereo.

### Feedback

Adds resonances to the effect. Higher settings produce a more pronounced effect.

### Low Cut

Attenuates the low frequencies.

### High Cut

Attenuates the high frequencies.

### Mix

Sets the ratio between the dry and the wet signal.

## Tremolo

This effect produces amplitude modulation, that is, cyclic modulation of the level of the sound.



### Rate

Determines the frequency of the amplitude modulation.

### Sync

Allows you to set the **Rate** value in fractions of beats.

### Depth

Sets the intensity of the amplitude modulation.

### Phase

Widens the sound image of the effect from mono to stereo.

## Output

Sets the output level of the effect.

# Ring Modulator

This effect provides a sine oscillator that is multiplied with the input signal. This creates metallic, or bell-like, frequencies.

The integrated LFO modulates the frequency of the sine oscillator to vary the created frequencies over time. In addition, an envelope follower is available, which can be used to modulate the frequency of the sine oscillator, depending on the level of the input signal.



## LFO Waveform and Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is produced.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

## LFO Freq

Allows you to specify the frequency of the LFO for modulating the frequency of the sine oscillator.

## Sync

Allows you to set the **LFO Freq** value in fractions of beats.

## LFO Depth

Sets the intensity of the LFO modulation of the sine oscillator frequency.

### Frequency

Determines the frequency of the sine oscillator.

### Mix

Sets the ratio between the dry and the wet signal.

### Envelope Follower

Traces the input signal with an adjustable attack and release time and delivers a modulation signal representing the level envelope of the signal.

### Sensitivity

All input signals are mixed down to mono before they are sent to the Envelope Follower. The **Sensitivity** parameter sets the optimum input level for the Envelope Follower.

### Attack

Adjusts the attack time, that is, the time the Envelope Follower needs to approach increasing input levels.

### Release

Adjusts the release time, that is, the time the Envelope Follower needs to approach decreasing input levels.

### Depth

Determines the output level of the modulation signal of the Envelope Follower.

## Frequency Shifter

A frequency shifter shifts each frequency of the input signal by a fixed amount.



Unlike pitch shifters, which shift the frequencies by a factor, maintaining the harmonic relations, a frequency shifter alters the harmonic relations. Therefore, a larger frequency shift usually results in a disharmonic sound. Furthermore, a frequency shifter alters the frequencies by adding an offset, while a pitch shifter multiplies the frequencies by a factor. The frequency shifter alters lower frequencies more than higher frequencies. For example, if the input signal has the frequencies 100 Hz, 1000 Hz, and 10000 Hz and you shift the frequency by +100 Hz, the resulting frequencies are 200 Hz, 1100 Hz, and 10100 Hz.

### Freq Coarse

Sets the amount of frequency shift.

### Freq Fine

Allows you to fine-tune the amount of frequency shift.

### L/R Coarse

Sets an offset for the left and right channels.

- Positive values shift the right channel upwards and the left channel downwards.
- Negative values shift the left channel upwards and the right channel downwards.

### L/R Fine

Allows you to fine-tune the offset between the left and right channels.

- Positive values shift the right channel upwards and the left channel downwards.
- Negative values shift the left channel upwards and the right channel downwards.

### Mod Coarse

Sets the maximum amount of frequency shift via modulation from LFO and Envelope Follower.

### Mod Fine

Allows for fine-tuning of the amount of frequency shift via modulation from LFO and Envelope Follower.

### Feedback

Sets the amount of feedback, that is, the amount of signal that is sent from the output of the effect back to its input. The sound is similar to that of a phaser. You can control the direction and the speed of this effect with the **Freq Fine** parameter.

### Notches

Sets the number of notches the phaser effect produces when you use larger amounts of Feedback.

## LFO Section

### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Freq

Specifies the frequency of the LFO in Hertz.

### Sync

Activate this to set the **Freq** parameter in fractions of beats.

### Depth

Determines the direction and amount of frequency shift from the LFO modulation signal.

### Envelope Follower

The Envelope Follower traces the input signal with an adjustable attack and release time and delivers a modulation signal representing the level envelope of the signal.



### Sensitivity

All input signals are mixed down to mono before they are sent to the Envelope Follower. This parameter sets the optimum input level for the Envelope Follower.

### Attack

Adjusts the attack time, that is, the time the Envelope Follower needs to approach increasing input levels.

### Release

Adjusts the release time, that is, the time the Envelope Follower needs to approach decreasing input levels.

### Depth

Determines the direction and amount of frequency shift from the envelope follower modulation signal.

#### NOTE

The maximum frequency shift via modulation from LFO or the Envelope Follower is determined by the parameters **Modulation Range Coarse** and **Modulation Range Fine**.

### Mix

Sets the ratio between the dry and the wet signal.

## Rotary

Rotary emulates the sound of a vintage rotary speaker including amplifier, horn, drum, and cabinet.

By emitting the sound via a rotating horn and drum, the rotary speaker produces a Doppler effect that thickens the sound. The horn and drum rotate at variable speeds, producing different amounts of the Doppler effect. The amplifier of the rotary speaker adds a warm sounding distortion, and the horn, drum, and cabinet color the sound in a unique way. The horn and drum are recorded via (virtual) microphones that can be set to different angles to broaden the sound image. Typically, rotary speakers are used with electric organs.





### Rotation Speed

Changes the rotation speed of the horn and drum. When set to **Fast**, the Doppler effect is stronger. When set to **Stop**, there is no Doppler effect because the drum and horn do not rotate. Because the horn and drum accelerate and decelerate at different speeds, the transition from **Slow** to **Fast** and vice versa generates highly interesting sounds.

### Distance

Sets the distance between the microphones and the horn and drum. The amplitude modulation of the sound decreases with the distance of the microphones. Set this to higher values for less amplitude modulation.

### Cabinet

The horn and drum sound different when recorded through the louvers of the cabinet. Use this parameter to color the horn and drum with the sound of the cabinet. With a setting of 100%, you obtain the full sound of the cabinet.

### Balance

Adjusts the balance between the horn and drum microphones. With a setting of 0%, you hear only the drum. With a setting of 100%, you hear only the horn.

### Slow

Adjusts the slow speed of the horn and drum at the same time.

### Fast

Adjusts the fast speed of the horn and drum at the same time.

### Accel

Adjusts the acceleration time for raising and lowering the rotation speed of the horn and drum.

### Horn Mic Angle

Adjusts the stereo spread of the horn microphones. With a setting of 0°, the sound image is mono. With a setting of 180°, the sound image is fully stereo.

### Drum Mic Angle

Adjusts the stereo spread of the drum microphones. With a setting of 0°, the sound image is mono. With a setting of 180°, the sound image is fully stereo.

### Input

Adjusts the gain before the rotary and drive.

### Drive

Adjusts the distortion of the amplifier.

### Output

Adjusts the gain after the rotary and drive.

### Color

Alters the sound of the Rotary effect by changing the timbre, which leads to the rotation of the horn and the drum being perceived with greater depth.

### Bass

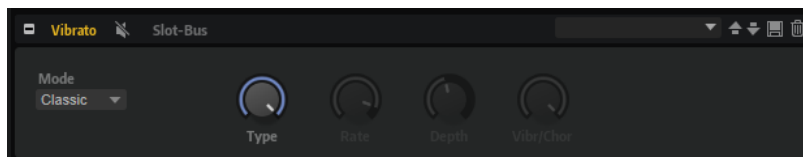
Adjusts the tone color of the low frequencies.

### Treble

Adjusts the tone color of the high frequencies.

## Vibrato

Vibrato emulates the chorus and vibrato effects of vintage organs. It thickens the sound by means of pitch modulation.



The effect provides direct access to the classic chorus and vibrato settings. In addition, there is a **Custom** mode that allows you to freely adjust the amount of chorus or vibrato.

### Mode

Allows you to select between **Classic** and **Custom** mode.

- **Classic** allows you to choose from several predefined chorus and vibrato settings.
- **Custom** allows you to freely adjust the chorus and vibrato settings with the **Rate**, **Depth**, and **Vibr/Chor** controls.

### Type

Allows you to switch between three classic predefined chorus and vibrato settings (**C1**, **C2**, **C3**, and **V1**, **V2** and **V3**, respectively).

### Rate

Sets the frequency of the pitch modulation.

### Depth

Sets the intensity of the pitch modulation.

### Vibr/Chor

Controls the mix between the vibrato and the chorus signal. At 100%, you only hear the chorus effect.

## Vintage Ensemble

This effect emulates the sound of classic ensemble modulation effects. It is based on a delay with LFO-modulated delay times. A secondary LFO with higher frequencies is used to produce the so-called shimmer.



**Rate**

Sets the frequency of the LFO.

**Sync**

Allows you to set the **Rate** value in fractions of beats.

**Depth**

Sets the intensity of the delay time modulation by the LFO.

**Shimmer**

Sets the intensity of a secondary faster delay time modulation.

**Shimmer Rate**

Determines the relation between the speed of the primary and the secondary delay modulation. For example, at a value of 10, the secondary modulation is 10 times faster.

**Low Cut**

Applies a low-cut filter to the signal. Only frequencies above the set frequency are sent to the effect.

**High Cut**

Applies a high-cut filter to the signal. Only frequencies below the set frequency are sent to the effect.

**FX Level**

Allows you to adapt the effect signal level to compensate for level reductions caused by the low-cut and high-cut filters.

**Mix**

Sets the ratio between the dry and the wet signal.

## Dynamics Effects

The **Dynamics** submenu contains the dynamics effects.

The Compressor, Limiter, Brickwall Limiter, Expander, Gate, and Maximizer effects work with an internal look-ahead function to ensure the best possible audio quality.

However, this look-ahead function introduces a small amount of latency. Usually, this is not noticeable, but in some cases, it might introduce unwanted side effects. For example, if you work with parallel compression where signals are sent to an AUX bus and being returned to the rest of the mix, this might lead to unwanted flanging effects.

If you are faced with latency issues, you have the following possibilities:

- For the Compressor, Expander, and Gate effects, activate the **Live** button to use the effects without look-ahead functionality.
- For the Limiter, Brickwall Limiter, and Maximizer effects, send the signals to one of the plug-in outputs and add the corresponding effect directly in the DAW, to make use of the host's delay compensation.

## Compressor

Compressor reduces the dynamic range of a sound. This way, the sound gains headroom. You can use this extra headroom to make the overall sound louder again.



The graphical control to the left indicates the compression curve. You can edit the **Threshold** and **Ratio** values with the handles of this control. The input and output VU meters indicate the level before and after the compression. The Gain Reduction meter indicates the current attenuation of the level.

### Threshold

Sets the threshold. Sounds that are louder than the threshold are reduced in gain. Sounds below the threshold remain unchanged.

### Ratio

Sets the amount of gain reduction for sounds that are louder than the threshold. The higher the ratio, the more the output is lowered. For example, if the ratio is set to 2:1 and the amplitude of the sound is 4 dB above the threshold, the output is lowered by 2 dB. If the amplitude is 8 dB above the threshold, the output is lowered by 4 dB.

### High Ratio

If this parameter is activated, **Ratio** is automatically set to the maximum value. This allows you to use the effect as a limiter, for example.

### Soft Knee

If this button is deactivated, signals above the threshold are instantly compressed, according to the set ratio. If **Soft Knee** is activated, the onset of the compression is more gradual, producing a less drastic result.

### Make-Up

Raises the overall sound. This can become necessary if too much gain reduction is introduced by the **Threshold** and **Ratio** parameters. You can see the amount of gain reduction in the Gain Reduction (**GR**) meter.

#### NOTE

This parameter is not available if the **Auto** button is activated.

### Auto Make-Up Gain

Sets the **Make-Up** value automatically, depending on the current **Threshold** and **Ratio** settings.

### Attack

Determines how fast the effect reacts to sounds that exceed the threshold. The longer the **Attack** time, the longer it takes to reduce the gain. With longer **Attack** times, the onset of sounds exceeding the threshold passes through unprocessed.

### Hold

Sets the time period during which the compression is applied after the sound exceeds the set threshold.

### Release

Determines how fast the Compressor effect reacts to sounds that fall below the threshold. The longer the **Release** time, the longer it takes to return to the original level.

#### NOTE

This parameter is not available if **Auto Release** is activated.

---

### Auto Release

Allows you to set the release time automatically. The Compressor analyzes the input sound continuously to find the optimal setting.

### Peak/RMS

Determines whether the input signal is analyzed based on **Peak** or **RMS** values or a mixture of both. With a setting of 0%, the compressor uses **Peak** sensing only, and at 100%, **RMS** sensing only. **Peak** means that the compressor senses the peak level of the sound. **RMS** means that the compressor senses the average power of the sound. **Peak** sensing responds faster than **RMS** sensing. Typically, **Peak** sensing is used for transient sounds and **RMS** sensing for sustained sounds.

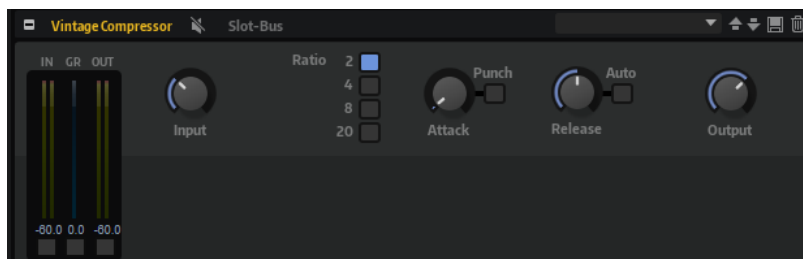
### Live

If this button is activated, the look-ahead feature of the effect is disengaged. Look-ahead results in more accurate processing, but adds a certain amount of latency as a trade-off. If **Live** mode is activated, there is no latency, which is better for live processing.

## Vintage Compressor

Vintage Compressor is modeled after vintage type compressors.

This compressor features separate controls for **Input** and **Output** gain, **Attack**, and **Release**. In addition to this, there is a **Punch** mode, which preserves the attack phase of the signal, and a program-dependent **Auto** feature for the **Release** parameter.



### In/Out Meters

Show the highest peaks of all available input and output channels.

### GR Meter

Shows the amount of gain reduction.

### Input

Determines the compression amount. The higher the input gain, the more compression is applied.

### Ratio

Sets the amount of gain reduction for sounds that are louder than the threshold. The higher the ratio, the more the output is lowered.

### Attack (0.1 to 100 ms)

Determines how fast the compressor responds. If the attack time is long, more of the initial part of the signal passes through unprocessed.

### Punch

If this is activated, the early attack phase of the signal is preserved, retaining the original punch in the audio material, even with short **Attack** settings.

### Release (10 to 1000 ms or Auto mode)

Sets the time after which the gain returns to its original level. If **Auto Release** is activated, the plug-in automatically finds the best release setting for the audio material.

### Output (-48 to 24 dB)

Sets the output gain.

## Tube Compressor

This versatile compressor with integrated tube-simulation allows you to achieve smooth and warm compression effects. The GR meter shows the amount of gain reduction. Tube Compressor features an internal side-chain section that allows you to filter the trigger signal.



### In/Out Meters

Show the highest peaks of all available input and output channels.

### GR Meter

Shows the amount of gain reduction.

### Input

Determines the compression amount. The higher the input gain, the more compression is applied.

### Limit

Increases the ratio of the compressor for a limiting effect.

### Drive (1.0 to 6.0)

Controls the amount of tube saturation.

### Attack (0.1 to 100 ms)

Determines how fast the compressor responds. If the attack time is long, more of the initial part of the signal passes through unprocessed.

### Release (10 to 1000 ms or Auto mode)

Sets the time after which the gain returns to its original level. If **Auto Release** is activated, the plug-in automatically finds the best release setting for the audio material.

### Output (-12 to 12 dB)

Sets the output gain.

### Mix

Sets the ratio between the dry and the wet signal, preserving the transients of the input signal.

### Side-Chain

Activates the internal side-chain filter. The input signal can then be shaped according to the filter parameters. Internal side-chaining is useful for tailoring how the gate operates.

### Monitor

Allows you to monitor the filtered signal.

### Filter Type (Low-Pass/Band-Pass/High-Pass)

If **Side-Chain** is activated, these buttons allow you to set the filter type to low-pass, band-pass, or high-pass.

### Center

If **Side-Chain** is activated, this sets the center frequency of the filter.

### Q-Factor

If **Side-Chain** is activated, this sets the resonance or width of the filter.

## Limiter

Limiter prevents the sound from exceeding the set output level. This can be used to avoid clipping in subsequent effects, for example.



The input and output meters indicate the level before and after the Limiter. The Gain Reduction meter in the middle indicates the current attenuation of the level.

### Input

Adjusts the input level of the sound. By increasing the input level, you can drive the sound more and more into limiting.

### Output

Sets the maximum output level of the sound.

### Release

Sets the time that the gain needs to return to its original level. The longer the release time, the longer it takes to return to the original level.

NOTE

This parameter is not available if the **Auto** button is activated.

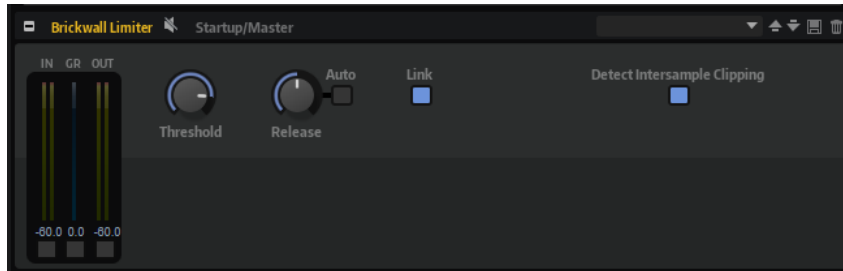
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**Auto**

Sets the release time automatically. The Limiter continuously analyzes the input sound to find the optimal setting.

## Brickwall Limiter

Brickwall Limiter ensures that the output level never exceeds a set limit.



Due to its fast attack time, Brickwall Limiter can reduce even short audio level peaks without creating audible artifacts. However, this plug-in creates a latency of 1 ms. Brickwall Limiter features separate meters for input, output, and the amount of limiting.

**Threshold (-20 to 0 dB)**

Determines the level where the limiter kicks in. Only signal levels above the set threshold are processed.

**Release (ms or Auto mode)**

Sets the time after which the gain returns to the original level when the signal drops below the threshold. If the **Auto** button is activated, the plug-in automatically finds the best release setting for the audio material.

**Link Channels**

If this option is activated, the plug-in uses the input from the channel with the highest level. If the option is deactivated, each channel is analyzed separately.

**Detect Intersample Clipping**

If this option is activated, the plug-in uses oversampling to detect and limit signal levels between two samples to prevent distortion when converting digital signals into analog signals.

NOTE

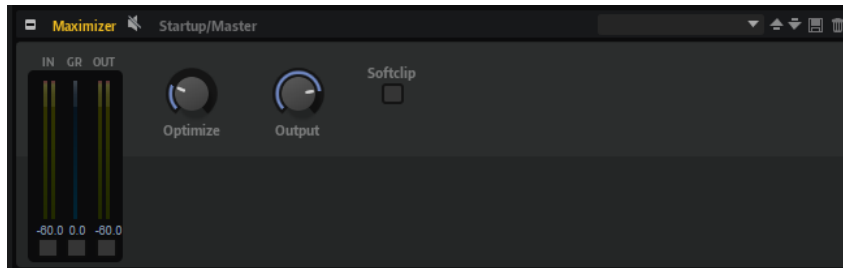
Brickwall Limiter is designed for the reduction of occasional peaks in the signal. If the Gain Reduction meter indicates constant limiting, try raising the threshold or lowering the overall level of the input signal.

---



## Maximizer

The Maximizer plug-in raises the loudness of audio material without the risk of clipping.



### Optimize

Determines the loudness of the signal.

### Output

Sets the maximum output level.

### Soft Clip

If this button is activated, **Maximizer** starts limiting or clipping the signal softly. At the same time, harmonics are generated, adding a warm, tube-like characteristic to the audio material.

## Expander

The Expander reduces the output level in relation to the input level for signals below the set threshold. This is useful to enhance the dynamic range or reduce the noise in quiet passages.



The graphical control to the left shows the expansion curve. You can edit the **Threshold** and **Ratio** values with the handles of this control. The input and output meters indicate the level before and after the expansion. The Gain Reduction meter indicates the current attenuation of the level.

### Threshold

Sets the threshold. Sounds that are softer than the threshold are reduced in gain. Sounds above the threshold remain unaffected by the process.

### Ratio

Sets the amount of gain reduction for sounds that are softer than the threshold. The higher the ratio, the more the output is lowered. For example, if the ratio is set to 2:1 and the amplitude of the sound is 4 dB below the threshold, the output is lowered by 2 dB. If the amplitude is 8 dB below the threshold, the output is lowered by 4 dB.

### Soft Knee

- If this button is deactivated, signals above the threshold are compressed instantly based on the set ratio.

- If this button is activated, the onset of the expansion is more gradual, producing a less drastic result.

### Attack

Determines how fast the Expander reduces the gain when the sound falls below the set threshold. The longer the attack time, the longer it takes to reduce the gain.

### Hold

Sets the time period during which the expansion is applied after the sound falls below the set threshold.

### Release

Determines how fast the Expander effect raises the gain after the sound exceeds the set threshold. The longer the release time, the longer it takes to raise the gain.

#### NOTE

This parameter is not available when the **Auto Release** button is activated.

### Auto

Activate this to set the release time automatically. The Expander analyzes the input sound continuously to find the optimal setting.

### Peak/RMS

Determines whether the input signal is analyzed based on **Peak** or **RMS** values or a mixture of both. With a setting of 0%, the expander uses **Peak** sensing only, and at 100%, **RMS** sensing only. **Peak** means that the expander senses the peak level of the sound. **RMS** means that the expander senses the average power of the sound. **Peak** sensing responds faster than **RMS** sensing. Typically, **Peak** sensing is used for transient sounds and **RMS** sensing for sustained sounds.

### Live

If this button is activated, the look-ahead feature of the effect is disengaged. Look-ahead results in more accurate processing, but adds a certain amount of latency as a trade-off. If **Live** mode is activated, there is no latency, which is better for live processing.

## Gate

The Gate effect passes sound only to its output if the input sound exceeds the set threshold. Sounds below the threshold are silenced.

An internal side-chain filter allows you to analyze a filtered version of the input sound instead. This way, the gate detects only certain frequencies of the input sound.



### Threshold

Determines the level that activates the gate. Signal levels above the set threshold trigger the gate to open, and signal levels below the set threshold close the gate.

### Filter

Activates the internal side-chain filter. If this button is activated, the input sound is filtered before it is analyzed. The gate opens only if the filtered sound exceeds the set threshold. When the **Filter** button is deactivated, the filter controls are not available.

### Filter Type

Sets the filter type for the side-chain filter. Select high-pass (**HP**) to detect high frequencies, band-pass (**BP**) to detect mid frequencies, and low-pass (**LP**) to detect low frequencies only.

### Monitor

Allows you to listen to the sound of the side-chain filter. The gate is inactive when the **Monitor** button is activated.

### Center

Sets the center frequency of the side-chain filter.

### Q-Factor

Adjusts the bandwidth of the filter from wide to narrow.

### Attack

Determines how fast the gate opens when the sound exceeds the set threshold. The longer the attack time, the longer it takes for the sound to fade in.

### Hold

Sets the time period during which the gate is applied after the sound falls below the set threshold.

### Release

Determines how fast the gate closes after the sound falls below the set threshold. The longer the release time, the longer it takes for the sound to fade out.

#### NOTE

This parameter is not available when the **Auto** button is activated.

---

### Auto

Sets the release time automatically. The gate continuously analyzes the input sound to find the optimal setting.

### Peak/RMS

Determines whether the input signal is analyzed based on **Peak** or **RMS** values or a mixture of both. With a setting of 0%, the gate uses **Peak** sensing only, and at 100%, **RMS** sensing only. **Peak** means that the gate senses the peak level of the sound. **RMS** means that the gate senses the average power of the sound. **Peak** sensing responds faster than **RMS** sensing. Typically, **Peak** sensing is used for transient sounds and **RMS** sensing for sustained sounds.

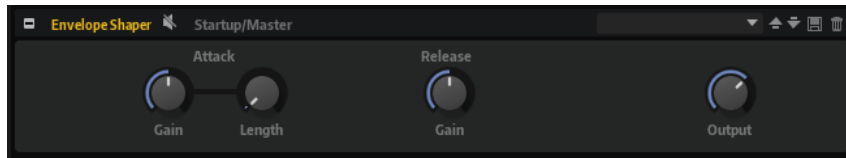
### Live

If this button is activated, the look-ahead feature of the effect is disengaged. Look-ahead results in more accurate processing, but adds a certain amount of latency as a trade-off. If **Live** mode is activated, there is no latency, which is better for live processing.

## Envelope Shaper

The Envelope Shaper effect can be used to attenuate or boost the gain of the attack and release phase of audio material.

Be careful with levels when boosting the gain and, if needed, reduce the output level to avoid clipping.



### Attack - Gain

Changes the gain of the attack phase of the signal.

### Attack - Length

Determines the length of the attack phase of the signal.

### Release - Gain

Changes the gain of the release phase of the signal.

### Output

Sets the output level.

## Spatial and Panner Effects

The **Spatial + Panner** submenu contains the stereo panorama effects.

### Stereo Pan

This effect allows you to set the stereo position and width of the signal.



### Input Swap

Swaps the stereo channels.

### Pan

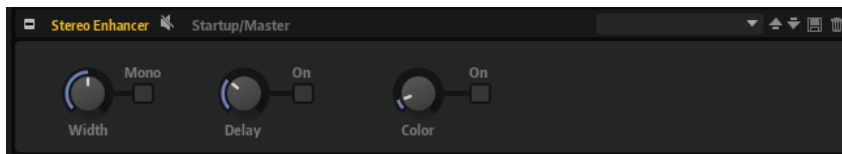
Sets the pan position of the signal. The panning is available for mono and stereo input signals.

### Width

Adjusts the stereo width of the signal from stereo to mono.

## Stereo Enhancer

The Stereo Enhancer effect expands the stereo width of stereo audio material. It cannot be used with mono files.



### Width

Controls the width or depth of the stereo enhancement. Turn clockwise to increase the enhancement.

### Delay

Increases the amount of differences between the left and right channels to further increase the stereo effect.

### Color

Generates additional differences between the channels to increase the stereo enhancement.

### Mono

Switches the output to mono, to check for unwanted coloring of the sound, which can occur when enhancing the stereo image.

## Surround Effects

The **Surround** submenu contains the effects for positioning the signal in the surround field and for downmixing a surround signal to stereo.

## Surround Panner

The Surround Panner allows you to position a signal in a two-dimensional surround field. You can either pan the left/right and the front/rear position individually, via the corresponding controls. Alternatively, use the positioning handle in the pan area to control both positions at the same time.



To move a sound source, click anywhere in the pan area and drag. Click to set the handle to a specific position.

You can limit movement to a specific direction using modifier keys. This way, you can scale down your movements or have the surround source move along a particular axis.

- Press **Shift** to allow for very fine mouse movements. This is useful when panning in the miniature display of the mixer channel, for example.
- To restrict movement to horizontal, press **Ctrl/Cmd**.

- To restrict movement to vertical, press **Ctrl/Cmd - Shift**.
- To restrict movement to diagonal (bottom left to top right), press **Alt/Opt**.
- To restrict movement to diagonal (bottom right to top left), press **Alt/Opt - Shift**.
- If the positioning handle is located outside the pan area, you can move the mouse pointer to the handle by pressing **Shift - Ctrl/Cmd - Alt/Opt**.

## Controls

### Left/Right

Adjusts the horizontal (X) position of the audio signal.

### Front/Rear

Adjusts the depth (Y) position of the audio signal.

### Width

Controls the width of the stereo input signal from 0% (mono) over 100% (stereo) to 141.4% (expanded stereo).

### LFE

Controls the level of the LFE channel.

### Rotate

Rotates the source channels around the positioning handle. All input channels circle around the handle – without moving beyond the borders of the surround field.

### Orbit Center

Rotates the entire signal around the center of the surround field.

### Radius

Changes the distance of the signal from the orbit center. By default, the radius is set to 100%, but you can lower it to move closer to the center or increase it to orbit on a larger circle.

### Center

Distributes part or all of the signal to the left and right front speakers. This can be used to widen the center signal. At 100%, the center source is provided entirely by the phantom image created by the left and right speakers. This can be useful if you want to rotate the surround signal without using the center speaker at all, for example. A blue line at the top of the surround field indicates the distance up to which a phantom signal is added. If you position the source signal inside this range, the signal is sent to all three channels.

## Downmix

This effect allows you to downmix a surround signal to a stereo signal.

### NOTE

For this effect, no controls are available, because the downmix is performed automatically.

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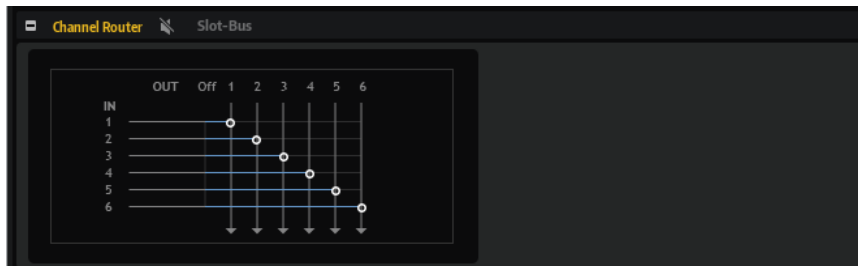
## Tools Effects

The **Tools** submenu contains the channel router effect that allows you adjust the channel routing for a bus.

### Channel Router

This effect allows you to change the channel routing of a bus, to adapt the channel format to different multi-channel samples, for example.

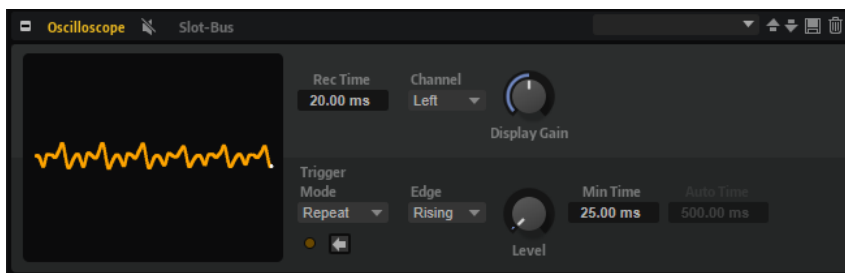
Each of the six input channels can be routed to a specific output channel.



- To set up the routing, click and drag the handles in the display.
- If a handle is set to **Off**, the corresponding input channel is not routed to an output.

### Oscilloscope

This effect allows you to visualize the input signal.



#### Display Settings

The top row of controls determines what is shown in the display on the left.

##### Record Time

Specifies the time that is recorded and visualized.

##### Channel

Allows you to choose the left channel, the right channel, or the sum of the two channels for display.

##### Display Gain

Allows you to adjust the displayed level.

#### Trigger Settings

The **Trigger** settings allow you to specify when the oscilloscope starts recording. You can specify the **Trigger Level**, specify whether this level must be reached from above or below, determine the **Minimum Trigger Time** between two recordings, and select one of three trigger modes.

### Trigger Mode

- **Repeat** triggers the recording every time the trigger conditions are met.
- **Auto** works like **Repeat**, but automatically triggers the recording after 500 ms if the trigger conditions have not been met in this period of time. This usually resets the display to a zero line.
- **Single** triggers the recording when the trigger conditions are met and stops after the specified **Record Time**. Afterwards, the display freezes.

### Edge

Specifies the direction in which the signal has to pass the **Trigger Level** to trigger the recording:

- Select **Rising** to trigger the recording when the rising signal passes the **Trigger Level**.
- Select **Falling** to trigger the recording when the falling signal passes the **Trigger Level**.
- Select **Any** to trigger the recording whenever the signal passes the **Trigger Level**.
- Select **Off** to always trigger the recording after the **Minimum Trigger Time**.

### Trigger Level

Specifies the level at which the recording starts.

### Minimum Trigger Time

Specifies the minimum time between two triggers. This can be used to optimize the visualization of complex periodic signals.

### Reset Trigger (Single)/Force Trigger

Resets the trigger in **Single** mode and forces a trigger in **Repeat** mode.

## Legacy Effects

The **Legacy** submenu contains legacy effects that were used in HALion 3.

### HALion 3 Legacy Effects

The HALion 3 effects on this menu are added to ensure compatibility with older projects.

#### Amp Simulator

Amplifier modeling effect.

##### Model

The type of amplifier model. This changes the tone character.

##### Mode

Mono/Stereo operation. Mono saves CPU, and in some cases sounds more solid.

##### Drive

Overdrive amount.

##### Feedback

Feedback amount. The result depends on the input signal.

##### Treble

Treble boost. Optionally in or out of phase for different tones.



**Mix**

Wet/dry mix.

**Bit Reduction**

Digital, lo-fi, quality degradation.

**Mode**

Determines whether the bit depth is fixed (**Linear**) or depends on the signal level (**Companding**).

**Rate**

Simulated sample rate.

**Depth**

Sample bit depth.

**Slew Rate**

Maximum rate of change of output waveform, for a soft, wooly distortion.

**Mix**

Wet/dry mix.

**Chorus**

A straightforward chorus effect that can be used to widen sounds.

**Rate**

The modulation rate.

**Depth**

The amount of pitch modulation.

**PreDelay**

The initial delay, to vary the tightness of the chorused voices in relation to the dry signal.

**Mix**

Wet/dry mix.

**Compressor**

A simple compressor effect.

**Threshold**

Compression threshold.

**Ratio**

Compression amount.

**Attack**

Attack time.

**Release**

Release time.

**Output**

Output level trim.

## **Delay**

A simple mono-in/stereo-out delay.

### **Time**

Delay time.

### **Sync**

If **Sync** is activated, you can set the delay time in fractions of beats.

### **Feedback**

Controls the number of delay repeats.

### **Balance**

Ratio of left delay time to right delay time.

### **Damp**

High-cut filter to soften delay repeats.

## **Distortion**

Hard clipping distortion.

### **Drive**

Distortion amount.

### **Bias**

Adjusts the balance between even and odd harmonics, that is, the character of the distortion.

### **Tone**

Distortion tone.

### **Out**

Output level trim.

### **Mix**

Wet/dry mix.

## **Early Reflections**

A short, dense reverb for simulating small acoustic spaces and to thicken or blur sounds.

### **Time**

Length of reverb tail. It also allows you to change the sound from dense early reflections to a trashy, grainy 80's-type reverb.

### **Low EQ**

Low-cut EQ.

### **High EQ**

High-cut EQ.

### **Mix**

Wet/dry mix.

## **Enhancer**

Psycho acoustic spectrum shaping.

### **High Depth**

High frequency boost, combined with mid cut.

### **High Tune**

High/mid tune.

### **Low Depth**

Low frequency boost.

### **Low Tune**

Low frequency tune.

## **Ensemble**

Chorus with a more complex modulation waveform for a lively thickening effect.

### **Rate**

The modulation rate.

### **Depth**

The amount of pitch modulation.

### **Shimmer**

Creates a more complex modulation effect.

### **Width**

Stereo width adjustment.

### **Mix**

Wet/dry mix.

## **Flanger**

A classic flanger effect.

### **Rate**

Sweep rate.

### **Depth**

Sweep depth.

### **Feedback**

Feedback amount. Increase for a more intense flanging effect.

### **PreDelay**

Initial delay. Adjusts the minimum delay time/maximum flange frequency.

### **Mix**

Wet/dry mix.

## **Gate**

Simple gate effect.

### **Threshold**

Gate threshold.

### **Range**

Level reduction when gate closed.

**Attack**

Attack time.

**Release**

Release time.

**Output**

Output level trim.

**Hall Reverb**

A simple reverb with adjustable pre-delay and damping.

**PreDelay**

Delays the wet signal to simulate larger acoustic spaces or to create a slap-back effect.

**Time**

Length of reverb tail.

**Damp**

Progressive damping of high frequencies.

**Low EQ**

Low-cut EQ.

**High EQ**

High-cut EQ.

**Mix**

Wet/dry mix.

**Limiter**

Hard level limiting.

**Drive**

Input signal drive.

**Attack**

Attack time.

**Release**

Release time.

**Output**

Output level trim.

**Long Delay**

This effect provides the same parameter set as the Delay effect, except that longer delays of up to four seconds can be set.

**Modulate L/R**

This effect features three modes of signal distortion, where one side of a stereo signal is used to modulate the other.

**Mode**

- **Ring Mod:** Ring modulation.

- **Env Mod:** The signal level of the right channel is modulated by the level of the left channel.
- **Duck:** The signal level of the right channel is reduced when the level of the left channel increases.

#### **Thru**

Defines which input signals are used as the dry signal for the Mix.

#### **Smooth**

Smoothing of modulation.

#### **Drive**

Level trim.

#### **Mix**

Wet/dry mix.

### **Multiband**

Three-band compressor.

#### **Drive**

Input signal drive (increase for more density).

#### **Lo/Hi**

Balance of low and high frequency bands.

#### **Mid**

Level of mid frequency band.

#### **Attack**

Attack time.

#### **Release**

Release time.

#### **Output**

Output level trim.

### **Non-Linear Reverb**

A gated reverb with a sharp cutoff.

#### **Time**

Length of reverb tail. It also allows you to change the sound from dense early reflections to a trashy, grainy 1980's-type reverb.

#### **Low EQ**

Low-cut EQ.

#### **High EQ**

High-cut EQ.

#### **Mix**

Wet/dry mix.

### **Overdrive**

Softer distortion with a gradual onset.

### **Drive**

Overdrive amount.

### **Bias**

Overdrive character. Adjusts the balance between even and odd harmonics.

### **Out**

Output level trim.

### **Mix**

Wet/dry mix.

## **Pan & Tremolo**

Autopan and Tremolo effect as used in vintage electric pianos.

### **Rate**

Sweep rate.

### **Phase**

Relative phase of left and right channel amplitude modulation, to vary from tremolo to autopan.

### **Shape**

Shape of modulation waveform from thin pulse, through sine, to fat pulse.

### **Mix**

Wet/dry mix.

## **Parametric EQ**

Two-band parametric equalizer.

### **Gain 1/2**

Cut/boost amount for the two bands.

### **Freq 1/2**

Sets the center frequency for the two bands.

### **Width 1/2**

Sets the bandwidth for the two bands (Q).

### **Output**

Output level trim.

## **Phaser**

A four pole phaser for subtle phasing effects.

### **Rate**

Sweep rate.

### **Depth**

Sweep depth.

### **Feedback**

Feedback amount. Increase for a more pronounced effect.

### **Stereo**

Offset between left and right modulation.

### **Center**

Sets the center frequency around which the modulation occurs.

### **Mix**

Wet/dry mix.

## **Rotary Speaker**

Simulation of a rotary speaker cabinet with high and low rotors.

### **Rate**

Master speed control: Stop, Slow, Fast.

### **Dirt**

Amount of overdrive.

### **LoHi**

Crossover frequency between low and high rotors.

### **Width**

Stereo width.

### **Tone**

Adjusts the tone of the overdriven signal.

### **Low/High Speed**

Speed of the high and low rotors.

### **Low/High Acceleration**

Acceleration of the high and low rotors.

### **Mix**

Wet/dry mix.

## **Shelf EQ**

Simple tone control.

### **Output**

Output level trim.

### **Bass**

Low frequency cut/boost.

### **Treble**

High frequency cut/boost.

## **Stereo Delay**

A stereo-in/stereo-out delay.

### **Time**

Delay time.

### **Feedback**

Controls the number of delay repeats. For minimum feedback, set the slider to the mid position. By moving the slider to the left or right, cross delay is applied, where left output feeds back into right input or vice versa.

### **Sync**

If **Sync** is activated, you can set the delay time in fractions of beats.

### **Balance**

Ratio of left delay time to right delay time.

### **Damp**

High-cut filter to soften delay repeats.

## **Stereo Width**

A stereo width enhancer with 4 modes.

### **Mode**

- **Adjust** mode adjusts the existing width of the stereo signal.
- **Swap** mode adjusts the existing width of the stereo signal and additionally swaps the left and right channels.
- **Comb** mode applies a stereo comb filter effect.
- **Haas** mode synthesizes the stereo width by delaying one channel.

### **Delay**

Delay time (not used in **Adjust** and **Swap** modes).

### **Width**

Overall width adjustment.

### **Low/Mid/High**

Width adjustment for the low, mid, and high frequencies.

### **Output**

Output level trim.

## **TalkBox**

Modulated vowel formant filter.

### **Rate**

LFO modulation rate.

### **Depth**

LFO modulation depth.

### **Vowel**

In center setting, vowels are produced when there is no modulation.

### **Env Mod**

Amount of vowel modulation by input signal level.

### **Env Att**

Rate of response to a rising input signal level.

### **Env Rel**

Rate of response to a falling input signal level.

### **Mix**

Wet/dry mix.



## Tape Delay

Simulation of a vintage 4-head analog tape delay.

### Time

Delay time.

### Sync

If **Sync** is activated, you can set the delay time in fractions of beats.

### Feedback

Controls the number of delay repeats.

### Vintage

Amount of vintage color and tape flutter.

### Mix

Wet/dry mix.

### Head 1

Delay level 1 (the output is panned left).

### Head 2

Delay level 2 (the output is panned right).

### Head 3

Delay level 3.

### Head 4

Delay level 4.

### Pan 3+4

Varies the panning of delays 3 and 4 from center to hard left/right.

### Vol 3+4

Varies the volume of delay outputs 3 and 4.

## Wah Pedal

An auto-wah effect.

### Rate

Modulation rate.

### Depth

Modulation depth.

### Pedal

Adjusts the filter frequency.

### Mode

- **Auto Wah:** Envelope controlled wah effect.
- **Pedal Wah:** No modulation. The **Pedal** parameter sets the frequency.
- **Mod Wah:** LFO modulation. The **Rate** parameter controls the modulation rate.

### Resonance

Sets the amount of filter resonance.

**Tracking**

Adjusts the envelope tracking speed in **Auto** mode, and the envelope rate modulation in **Mod** mode.

**Mix**

Wet/dry mix.

# MIDI Modules Reference

The MIDI modules in HALion range from standard arpeggiator modules to more dedicated modules that trigger specific events or deliver specific modulation signals.

MIDI modules can be used to control articulations of sampled instruments, for example. They process the stream of MIDI events within a program. In addition, they can produce monophonic modulation signals, which can be used as sources in the modulation matrix. MIDI modules can be assigned to an entire program or to specific layers. This way, you can process the MIDI stream of an entire program, or parts of it.

To perform more complex tasks, you can assign multiple MIDI modules in series.

- To add a module, click **Create New MIDI Module** on the toolbar of the **Program Tree**, and select a MIDI module.

## Common Functions

Some functions and settings are available in several MIDI modules. These are described in the following sections.

## Inserting MIDI Modules

---

### PROCEDURE

1. In the **Program Tree**, select the program or layer for which you want to insert the MIDI module.
2. Right-click the program or layer, and select **New > MIDI Module**.
3. Select the MIDI module that you want to insert.

You can also insert multiple MIDI modules and use them in series.

---

## Bypassing MIDI Modules

Bypassing a MIDI module can be used to play a layer without the FlexPhrasers or the conditions that are set with the MegaTrig module, for example.

---

### PROCEDURE

- To bypass a MIDI module, activate **Bypass**  in the top right of the section of the **MIDI Modules Editor**.
-

## MIDI Modules Editor

In the **MIDI Modules Editor**, you can edit the parameters of the MIDI modules. The editor shows the MIDI modules that are selected in the **Program Tree**.



The buttons at the top of the editor allow you to specify the modules to be affected.



### Show MIDI Modules Contained in the Corresponding Layer

If this button is activated, the MIDI modules that are used in the current layer are displayed.

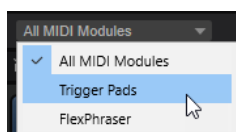
### Show MIDI Modules Higher up in the Signal Flow

If this button is activated, the MIDI modules that are used in the current layer and those used higher up in the signal flow are displayed.

### Show MIDI Modules Combined

If this button is activated, MIDI modules of the same type are combined, allowing you to modify the selected MIDI modules simultaneously. The number of module instances that are edited together is displayed behind the module name on the title bar. Parameter settings that differ in the individual MIDI modules are shown in red.

On the **Show Only Selected Module Type** pop-up menu, you can specify which combined MIDI Module type is shown in the editor.



### ABS/REL

Allows you to select whether changes to the parameter values are absolute or relative.

### SEL/ALL

Allows you to select whether to apply the editing to all or to the selected MIDI modules.

### RELATED LINKS

[Absolute and Relative Editing](#) on page 117

## Changing the Order of the MIDI Modules

MIDI modules are processed in the order in which they are displayed in the **Program Tree**, from top to bottom.

---

### PROCEDURE

- To change the order of the MIDI modules, drag them to new positions in the **Program Tree**. The routing between the MIDI modules changes accordingly.
- 

## Assigning MIDI Modules in the Modulation Matrix

Some MIDI modules, like the FlexPhraser, process the MIDI events themselves. Other MIDI modules, like True Pedaling, produce modulation signals that must be assigned as a source or as a modifier in the modulation matrix before they can be used.

---

### PROCEDURE

1. In the **Program Tree**, select the zones that you want to edit.  
Make sure that the zones are part of a program or layer with a MIDI module that produces modulation signals.
  2. Open the **Sound Editor**, and show the **Modulation Matrix** section.
  3. On the pop-up menu of the **Source/Modifier** column, open the **Modulation Module** submenu, and select a MIDI module.  
The submenu lists only MIDI modules that belong to the same layer or that are higher up in the hierarchy.
- 

## Adding and Deleting your own MIDI Modules

You can program your own MIDI modules with the script engine of HALion and make them available on the **Create New MIDI Module** menu.

- To add a module to the MIDI module library, right-click it in the **Program Tree**, select **MIDI Module Library > Save Module**, enter a name for the module, and click **Save**.

### NOTE

You can also create subfolders within the library folder to organize your own MIDI modules. These subfolders appear on the **Create New MIDI Module** menu as submenus.

- To delete a module from the library, right-click it in the **Program Tree**, select **MIDI Module Library > Delete Module**, select the module, and click **Open**, then **Yes**.

### NOTE

Deleted modules cannot be retrieved. They are erased from disk.

---

RELATED LINKS

[Lua Script](#) on page 671

## FlexPhraser

The FlexPhraser is an arpeggio and phrase player.

You can choose from a great variety of phrases that suit a wide range of musical instruments and styles. Depending on the selected phrase, the FlexPhraser uses your live playing to modify the phrase in real-time. This allows you to re-harmonize phrases by playing different chords, for example.

### Presets

FlexPhraser presets contain the selected phrase, as well as the performance settings of the FlexPhraser, such as **Tempo**, **Tempo Scale**, **Loop**, **Swing**, etc.

#### NOTE

Presets can only be saved and loaded for phrases, not for sliced loops.

---

RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## Loading Phrases

Phrases are sorted into subfolders, according to the type of instrument. Each instrument subfolder contains phrases of different musical styles.

#### NOTE

Some FlexPhrases make extensive use of key switches to switch between multiple playing styles of an instrument while playing. These phrases can be found on the **Construction Sets** submenu. They work best with the corresponding instrument layers.

---

#### PROCEDURE

1. At the top of the FlexPhraser, click in the **Phrase** field.
2. On the pop-up menu, open the submenu for the instrument, and select the phrase that you want to load.

In general, you can apply any phrase to any type of instrument. However, a phrase for guitar might not be suitable for use with a piano, for example.

---

## FlexPhraser Parameters



### Act

Activates the FlexPhraser.

### User

Activates the user phrase and the user phrase editor.

### Phrase

Allows you to select a phrase.

### KSOFF (Key Switches Off)

Phrases that make use of key switches and noises, such as fret noises for guitar phrases, for example, usually only work with programs for the same type of instrument. Programs without key switches and noises interpret these events as regular notes and include them during playback, which yields unexpected results. To avoid the playback of key switches and noises, activate **KSOFF**.

#### NOTE

**KSOFF** filters out any note events that do not transpose with your playing. Therefore, it is not recommended for use with drum phrases.

#### NOTE

**KSOFF** is not available for user phrases.

### Drag MIDI Phrase to Host Sequencer

Allows you to drag the recorded MIDI phrase to your host sequencer.

### Record Output

Allows you to record the MIDI output of the arpeggiator.

### Variations

The variation buttons allow you to switch between the available variations.

### Loop

Allows you to play the phrase in a loop.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

### Mute

Mutes the FlexPhraser. The phrase still plays in the background. If you deactivate **Mute**, playback resumes immediately.

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.

- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Trigger Mode

Determines the moment when the FlexPhraser scans for new notes that you play on the keyboard.

- If this is set to **Immediately**, the FlexPhraser scans for new notes all the time. The phrase changes immediately, in reaction to your playing.
- If this is set to **Next Beat**, the FlexPhraser scans for new notes at every new beat. The phrase changes in reaction to your playing on each new beat.
- If this is set to **Next Measure**, the FlexPhraser scans for new notes at the start of new measures. The phrase changes in reaction to your playing on each new measure.

### Restart Mode

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Chord** restarts the phrase on new chords.

NOTE

The phrase does not restart upon notes that are played legato.

---

- **New Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.

### RstVar (Restart on Variation Change)

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the FlexPhraser, even if no new notes or chords were triggered.

### Key Mode

Determines if and how the playback of the phrase is affected by the order of the notes, as played on the keyboard.

- If **Sort** is selected, the notes are played in the order of the selected phrase, regardless of the chronological order.
- If **As Played** is selected, the notes are played in the order in which you play them on the keyboard.
- If **Direct** is selected, the phrase creates controller events instead of notes. You hear the notes that you play plus any controller events of the phrase, such as pitch bend, volume, pan, etc.

NOTE

Not all phrases contain controller data.

---

### Vel Mode

- If **Original** is selected, the notes of the phrase play with the velocity that is saved in the phrase.



- If **Vel Controller** is selected, you can choose a velocity controller to generate or modulate the velocities of the notes.
- If **Original + Vel Controller** is selected, the phrase velocity is determined by the combination of the velocity saved in the phrase and the velocity derived from the velocity controller.

### Vel Controller

If the **Vel Mode** pop-up menu is set to **Vel Controller** or **Original + Vel Ctrl.**, the **Vel Controller** pop-up menu is available. It allows you to generate or modulate the velocities of the notes using the incoming controller values.

- If **Velocity** is selected, the triggered notes inherit the velocity of the note that you play.
- If **Aftertouch** is selected, the triggered notes receive their velocity from the aftertouch controller.
- If **Poly Pressure** is selected, the triggered notes receive their velocity from the poly pressure controller. This allows you to control the velocity via the keys.
- Selecting **MIDI Controller** opens a submenu, where you can select a MIDI controller.

The value of this MIDI controller is used as the velocity for the triggered notes.

### Fetch

If the **Vel Controller** pop-up menu is set to **Aftertouch**, **Poly Pressure**, or a MIDI controller, you can use the **Fetch** option to change the way that the notes are generated.

- If **Fetch** is activated, the first note that you play defines the initial velocity. As soon as the controller value exceeds this velocity, new notes receive their velocity from the controller.
- If **Fetch** is deactivated, the generated notes receive their velocity from the current controller value.

#### NOTE

**Fetch** is not available if the **Vel Controller** pop-up menu is set to **Velocity**.

---

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the FlexPhraser. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Octaves

Extends the phrase playback to include higher or lower octaves. Positive settings extend the playback to higher octaves, and negative settings to lower octaves. For example, a value of +1 first plays the phrase in the octave range that you originally played. Then, it repeats the phrase one octave higher.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

## Recording the MIDI Output of the FlexPhraser

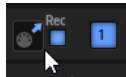
The phrases played by the FlexPhraser depend on the notes that are played and can therefore not be exported directly. However, it is possible to generate exportable phrases by recording the MIDI output of the FlexPhraser.

---

### PROCEDURE

1. Click **Record FlexPhraser MIDI Output**.

The arrow in the **Drag MIDI** field starts flashing to indicate record mode.



2. Play some notes.

3. When you are done, click **Record FlexPhraser MIDI Output** again.

Recording stops. In the **Drag MIDI** field, the arrow remains lit to indicate that a MIDI phrase can be exported.

4. Click the **Drag MIDI** field, and drag the phrase on a MIDI track in your host sequencer application.
- 

## Phrase Playback Types

HALion features a substantial selection of phrase types, organized in submenus and categorized according to functional descriptions or musical styles, such as **Classic Arp**, **Synth Seq**, **Chord Seq**, **Bass**, etc.

The **Construction Sets** submenu contains phrases made for instrument layers. These phrases use key switches to switch between different playing styles, to increase the realism of your performance. The phrases that can be found in the various other categories use a number of different playback types to allow phrase-specific user interaction while playing.

For example, with drum patterns, pressing any note triggers the same rhythm pattern. Other phrases are played back using only the played note and its octave notes. And if you play back a programmed sequence according to the played chord, the following applies:

- If you press a single key, the phrase is played back using the programmed sequence, which means that notes other than the ones you play are triggered.
- If you are adding notes to those already held, the sequence changes accordingly, for example, the phrase plays back according to the chord you play.

## Variations

For each module, you can set up eight different variations of phrases. You can switch between them with the variation buttons at the top right.

You can remote-control the variation buttons using the trigger pads, which gives you the possibility to switch between variations by playing the trigger keys that are assigned to the trigger pads.

### NOTE

To prevent switching to another variation in the middle of a beat or measure, use the trigger modes **Next Beat** or **Next Measure**.

---

## Creating FlexPhraser Variations

### PROCEDURE

1. Click one of the variation buttons at the top right of the FlexPhraser.
  2. You can either start from scratch or base the new variation on an existing variation.
    - To start from scratch, assign a phrase and edit the FlexPhraser settings.
    - To use an existing variation as a base, use the context menu commands **Copy FlexPhraser Variation** and **Paste FlexPhraser Variation**.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Key Mode**, **Vel Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once for each inserted FlexPhraser module.

---

### RELATED LINKS

[Switching between Variations](#) on page 636

## User Phrases

The user pattern of the FlexPhraser has up to 32 steps. Each step has an adjustable velocity, gate length, and transpose value. By setting the steps, adjusting their length, or leaving pauses, you define the rhythm of the user pattern.

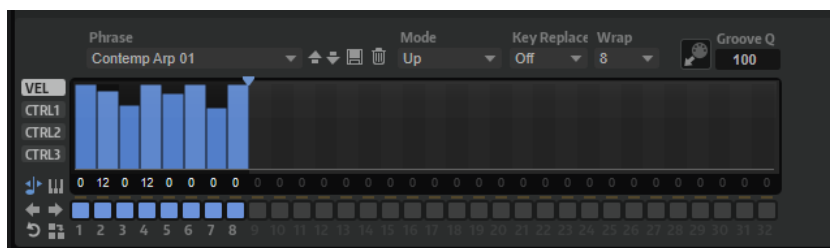
You can combine consecutive steps to create longer notes. By selecting a mode, you define how the notes play back. In addition, there are three MIDI control sequences, that is, each step can send three modulation signals.

To create your own phrases, activate the **User** button.

For user phrases, the regular FlexPhraser parameters are available, except for the **KSOFF** button.

## User Phrase Editor

In the user phrase editor, you can set up your user phrases.



You can display the velocity curve or three MIDI controller sequences for the phrase.

### Phrase

To load a phrase, select it from the **Phrase** pop-up menu.

#### NOTE

Saved phrases include the **Mode**, **Key Replace**, and **Wrap** parameters, as well as the steps with their **Level**, **Length**, and **Legato** settings. The selected MIDI controllers or any settings on the main FlexPhraser page are not saved.

### Mode

Specifies the playback of the notes.

- If **Step** is selected, the last note that is received triggers a monophonic sequence.
- If **Chord** is selected, the notes are triggered as chords.
- If **Up** is selected, the notes are arpeggiated in ascending order.
- If **Down** is selected, the notes are arpeggiated in descending order.
- If **Up/Down 1** is selected, the notes are arpeggiated first in ascending, then in descending order.
- If **Up/Down 2** is selected, the notes are arpeggiated first in ascending, then in descending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.  
If **Key Mode** is set to **As Played**, the first and the last note are repeated.
- If **Down/Up 1** is selected, the notes are arpeggiated first in descending, then in ascending order.
- If **Down/Up 2** is selected, the notes are arpeggiated first in descending, then in ascending order. This mode depends on the set **Key Mode**.  
If **Key Mode** is set to **Sort**, the highest and the lowest note are repeated.

If **Key Mode** is set to **As Played**, the first and the last note are repeated.

- If **Random** is selected, the notes are arpeggiated in random order.

### Groove Q

To adapt the timing of a phrase to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field. You can quantize the playback of the user phrase to the timing of a sliced loop by dragging its MIDI file from the **MIDI export** drag field to the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter to the right of the drop field determines how accurately the phrase follows the timing of the MIDI file.

### Key Select

The FlexPhraser scans the keyboard and writes the keys that you press into a note buffer.


Depending on the selected **Key Mode**, this note buffer is sorted either by pitch or in the order in which you play the keys.

**Key Select** allows you to play back a defined key from the note buffer. You can set up **Key Select** for each step individually, which allows you to create very elaborate phrases.

#### NOTE

**Key Select** cannot be used in **Step** or **Chord** mode.

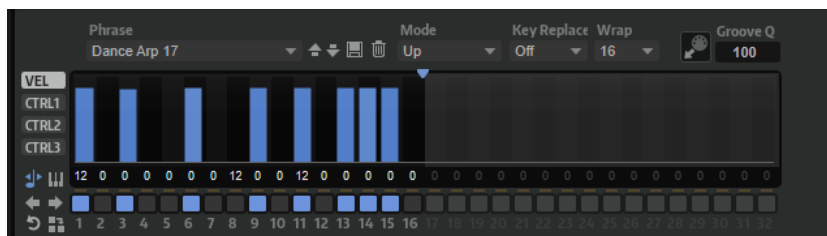
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- To access the **Key Select** values of the steps, click **Show Key Values**  to the left of the editor.
- To switch between the available **Key Select** values for a step, click the value and drag up/down, or use the scroll wheel.

The following options are available:

- **P** (Phrase) plays the note of the user phrase, according to the selected mode, for example, **Up**, **Down**, **Up/Down 1**, etc.
- The settings **1 - 8** play the corresponding keys from the note list. Which key is played depends on the **Key Mode** setting. For example, if **Key Mode** is set to **Sort**, the setting **1** plays the lowest key.
- **L** (Last) always plays the last key from the note buffer. Depending on the **Key Mode**, this is the highest note or the last note in the note buffer.
- **A** (All) plays all keys from the note buffer as a chord.

### Velocity Curve



### Key Replace

With this parameter, you can deactivate the **Key Select** function or specify how to replace missing keys.

For example, if **Key Select** is set to 1 - 2 - 3 - 4 and you play a chord with 3 notes, key 4 is considered missing.

- **Off** deactivates **Key Replace** and **Key Select**. The selected arpeggio plays back without modifications.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio inserts a rest instead.
- **1st** replaces the missing keys with the first note in the note buffer.
- **Last** replaces the missing keys with the last note in the note buffer.
- **All** replaces the missing keys with all notes in the note buffer. The notes are played as a chord.

NOTE

**Key Replace** can be set for each individual variation.

---

### Wrap

For all modes except **Step** and **Chord**, you can use this parameter to restart the arpeggio after a specified number of steps.

NOTE

Deactivated steps are taken into account.

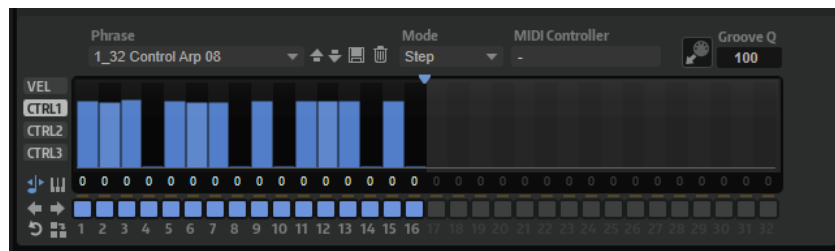
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In **Step** and **Chord** mode, this parameter only affects the **Octaves** setting.

If the **Octaves** parameter is active, the arpeggio traverses the octaves and restarts from the original octave after the specified number of steps.

### Controller Curve

To show a controller curve, click one of the controller buttons on the left.



#### MIDI Controller

Allows you to select the MIDI controller that you want to use.

### Editing User Phrases

You can make detailed settings for the user phrase in the editor for the user phrases.

To set up the phrase, activate the **Vel** button to the left of the step display.

To set up a controller curve for the phrase, activate one of the controller buttons to the left of the step display.

- To specify the number of steps for the pattern, drag the **Number of Steps** handle to the right or left.

## Activating Steps

A phrase can contain up to 32 steps. Only the steps that are activated are played.

- To activate a step, click its **On/Off** button below the display.  
This can be necessary if you change the gate length of one step so that it overlaps with the following step, thereby deactivating it.

### NOTE

If you activate a step that was inactive because of an overlapping previous step, the previous step is shortened.

- To activate all steps, right-click in the step display, and select **Enable All Steps** from the context menu.

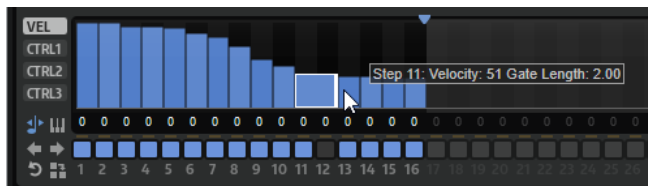
## Editing Steps

The height of a step represents its value. You can edit the steps in the following ways:

- To activate all steps, select **Enable All Steps** from the context menu.
- To adjust a value, click a step, and drag up or down.
- To adjust multiple steps, click and draw a curve.
- To adjust the velocity of all steps relatively, **Shift**-click and drag.
- To draw a ramp with steps, hold down **Alt/Opt**, and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift**-**Alt/Opt**, and draw a line.
- To transpose a step, click in the field below it, and enter the number of semitones for the transposition.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **Shift**-**Ctrl/Cmd**, and click a step.
- To introduce a legato between two steps, click the number below the first of these steps, so that a small arrow is shown.

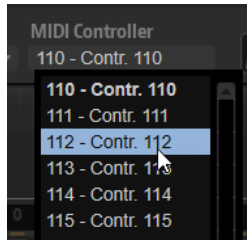
If **Legato** is activated, the **Gate Scale** parameter is not taken into account.

For velocity steps, the width of a step represents its gate length.







- To adjust the gate length of a step, drag its right border.
- To adjust the gate length of all steps, hold down **Shift**, and drag the right border of a step.  
You can only adjust the length this way until a step reaches the next step. If you increase the gate length of a step so that it overlaps with the following step, the latter step is deactivated.
- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.
- To reset the length of all steps, hold down **Shift**-**Ctrl/Cmd**, and click on a highlighted right border.
- To fill the gaps between consecutive steps, select **Fill Gap** or **Fill All Gaps** from the context menu.

Each MIDI controller lane can send a MIDI controller. By selecting the same MIDI controller as a source in the modulation matrix, you can modulate any of the destinations with the MIDI controller sequence.



- To assign a controller, open the **MIDI Controller** pop-up menu, and select the controller, or use the corresponding control on your hardware.

### Adjusting the Phrase

- To shift the rhythm of the phrase, click **Shift Phrase Right**  or **Shift Phrase Left** .
- If you shift the rhythm of the phrase to the left, the first step is moved to the end. If you shift the phrase to the right, the last step is moved to the beginning.
- To reverse the phrase, click **Reverse Phrase** .
- To duplicate short phrases, click **Duplicate Phrase** .

#### NOTE

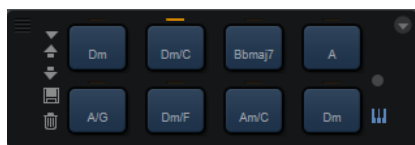
The maximum number of steps is 32. Therefore, phrases that contain more than 16 steps cannot be duplicated as a whole.

---

## Trigger Pads

You can use the trigger pads to trigger single notes or whole chords and to switch between FlexPhraser or arpeggiator variations.

Many of the programs that come with HALion make use of the trigger pads.



If a note or a chord is assigned to a pad, this pad turns blue. If a pad switches between variations, the line above the pad turns orange.

- To trigger a pad, click on it.

### Presets

Pad presets save trigger notes and chord snapshots, but not the FlexPhraser variations. This means that you can exchange trigger notes and chords by loading presets without losing your FlexPhraser variation settings.

### Bypass

Bypassing the Trigger Pads module deactivates any functionality assigned to the trigger pads.

#### RELATED LINKS

[Handling Section and Module Presets](#) on page 25



## Assigning Trigger Notes to Pads

You can assign a MIDI note to a pad and trigger the pad by playing this note.

To define the trigger note, do one of the following:

- Right-click a pad, open the **Assign Trigger Note** submenu, and from the further submenus, select the octave and note that you want to assign.
- Open the context menu for a pad, select **Learn Trigger Note**, and play the note on your MIDI keyboard, or click a key on the internal keyboard.

The name of the assigned trigger note is displayed in the top left corner of the pad.

On the internal keyboard, keys that serve as trigger notes are shown in blue. These keys do not play sounds but trigger the corresponding pads instead.

- To remove a trigger note from a pad, right-click the pad, and select **Forget Trigger Note**.

## Assigning Chords or Notes to Trigger Pads

---

### PROCEDURE

1. Right-click a pad, and select **Snapshot Chord**.

The pad starts flashing.

2. Do one of the following:

- Play a chord or a single note, and then click the pad that is flashing to assign the chord or note to the pad.
- Drag a chord event from the chord track of your Steinberg DAW onto a trigger pad. This transfers the corresponding MIDI notes to the pad.

If you first drag a chord event onto the internal keyboard, the corresponding chord is played back. This is useful to verify whether you selected the correct chord.

If you define a chord that contains a key switch, you can trigger the chord with a specific instrument expression.

If you add keys to a chord that also work as trigger notes, they trigger the underlying MIDI note instead of the trigger note.

---

### RESULT

Triggering the pad now plays the chord or note.

## Default Trigger Note Settings

Assigned trigger notes are saved with each program to allow for maximum flexibility. However, you can save a fixed set of default trigger notes to reflect an existing hardware setup, for example.

- To specify a default set of trigger notes, set up the trigger notes for all pads, right-click a pad, and select **Save Trigger Notes as Default**.
- To activate the default trigger note settings, right-click a pad and select **Use Default Trigger Notes**.

From now on, changing programs or multi-programs does not change the trigger notes anymore.

If you deactivate **Use Default Trigger Notes**, the last set of trigger notes remains active. To return to the trigger notes that were saved with the program, reload the program.

## Assigning Key Switches to Trigger Pads

To use the pads for switching between expressions, assign them to the corresponding key switches.

---

### PROCEDURE

- Right-click a pad, select **Snapshot Chord**, and play the key switch.
- 

## Removing Chords or Notes from Trigger Pads

---

### PROCEDURE

- Right-click the trigger pad, and select **Clear Chord**.
- 

## Switching between Variations

You can switch between variations using the trigger pads.

Variations are available for the FlexPhraser and the B-Box, for example.

---

### PROCEDURE

1. Right-click the trigger pad that you want to use for switching to the selected FlexPhraser variations.
  2. On the menu, select **Snapshot Variations**.  
The line above the pad turns orange to indicate that a FlexPhraser variation is assigned.
- 

### RESULT

If you trigger the pad, it switches to the variation that was selected when you made the snapshot.

### NOTE

Instead of saving the variation settings themselves, the trigger pad saves only the variations that were selected when you made the snapshot. This allows you to modify variations after creating the snapshot. However, if you replace or add layers, you must first remove the assignment using the **Clear FlexPhrasers** command on the context menu and then take the FlexPhraser variation snapshot again.

---

### RELATED LINKS

[Creating FlexPhraser Variations](#) on page 629  
[B-Box](#) on page 393

## Naming Pads

Entering names for pads allows you to obtain a better overview of their functionality, for example.

---

### PROCEDURE

1. Right-click the pad to open the context menu, and select **Rename Pad**.

2. Enter the new name, and press **Enter**.
- 

## Combining Multiple Trigger Pads Modules

You can use multiple Trigger Pads modules inside a layer, in a serial connection.

This allows you to memorize and trigger more than eight chords, for example. However, it is not possible to memorize more than eight FlexPhraser variations. Only the last Trigger Pads module can be used to switch between FlexPhraser variations.

## Creating MIDI parts from Trigger Pads

You can create a MIDI part of the chord that is assigned to the pad by using drag and drop.

---

### PROCEDURE

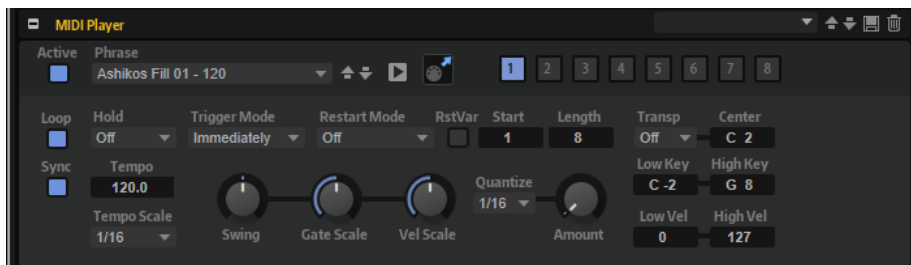
- Drag a trigger pad outside the **Trigger Pads** section, and drop it in the project window of your Steinberg DAW or another host sequencer.
- 

### RESULT

A MIDI part containing the chord that is assigned to the pad is created. The length of the part is one bar.

## MIDI Player

The MIDI Player allows you to load up to eight different MIDI files. For example, you can load different variations of a MIDI file and modify these variations by using the performance parameters.



You can use the Trigger Pads to switch between variations.

### NOTE

The MIDI Player was developed for use with single track phrases, not multi-track MIDI files. If you use multi-track MIDI files, all tracks are played back.

---

### Presets

MIDI Player presets contain the selected MIDI phrases, as well as the performance settings of the MIDI Player, such as **Tempo**, **Tempo Scale**, **Loop**, **Swing**, etc.

### RELATED LINKS

[Handling Section and Module Presets](#) on page 25


## Loading MIDI Phrases

---

### CHOICES

- Click in the **Phrase** field, and select a phrase from the pop-up menu.  
The phrases are sorted into subfolders, according to their musical uses.
  - Drag a phrase on the **Phrase** field.
  - Drag one or more phrases on a variation button.  
If the MIDI files contain controller data, the data is sent to the modulation matrix, where the controllers can be used as modulation sources.  
If you drag multiple files, they are automatically distributed to different variation buttons.
- 

## Playing Back MIDI Phrases

- Click the play button  next to the **Phrase** field to play back the MIDI phrase.  
Click again to stop playback.

## MIDI Player Parameters

### Active

Activates the MIDI Player.

### Phrase

Allows you to select a phrase.

### Play/Stop

Allows you to play back the phrase.

### MIDI Export Field

Allows you to export the phrase using drag and drop.

### Variation buttons

Allow you to load up to eight MIDI files.

### Loop

If this is activated, the MIDI file plays back in a loop.

### Sync

Synchronizes the MIDI file to the tempo of your host application.

### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Hold

Allows you to prevent the phrase from stopping or changing when the keys are released.

- If **Off** is selected, the phrase changes as soon as you release a key. The phrase stops immediately when you release all keys.
- If **On** is selected, the phrase plays to the end, even if the keys are released. If **Loop** is activated, the phrase is repeated continuously.

- If **Gated** is selected, the phrase starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the phrase.

### Trigger Mode

Determines how long it takes for phrases to change when you switch to another variation.

- If this is set to **Immediately**, the phrase changes as soon as you switch to another variation.
- If this is set to **Next Beat**, the phrase changes on the first new beat after you switch to another variation.
- If this is set to **Next Measure**, the phrase changes on the first new measure after you switch to another variation.

### Restart Mode

Determines when the phrase is restarted.

- If this is set to **Off**, the phrase runs continuously and does not restart at chord or note changes.
- **New Note** restarts the phrase on new notes.

#### NOTE

The phrase does not restart upon notes that are played legato.

---

- **Each Note** restarts the phrase with each new note that you play.
- **Sync to Host** aligns the phrase with the beats and measures of your host application each time that you start the transport.
- **Follow Transport** follows the transport control of your host application. Playback starts and stops automatically as soon as your host application starts and stops playing.

### RstVar (Restart on Variation Change)

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the MIDI Player, even if no new notes or chords were triggered.

### Start

Shifts the start of the loop in steps of 1/4 notes. The end of the loop is not shifted, that is, the loop is shortened.

### Length

Shortens the loop in steps of 1/4 notes.

### Transpose

Allows you to transpose the original MIDI phrase, according to the key that you play.

- If this is set to **Off**, the phrase is not transposed.
- If this is set to **On**, the MIDI phrase is transposed by the specified value.
- If this is set to **Pitch**, the MIDI notes themselves are not modified, but each note is sent with a pitch transpose value instead.

For example, if the MIDI phrase is used to trigger a multi-sampled drum kit, this does not change which instrument is triggered, but the pitch at which it is played.

### Center Key

Determines the MIDI note that is used as the central position for the **Transpose** function.

### Sync

Synchronizes the phrase to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the phrase with the beats and measures of your host application.

---

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the MIDI Player.

### Tempo Scale

Defines the rate at which notes are triggered, that is, the speed at which the phrase is running. In addition to the **Tempo** parameter, this gives you further control over the playback speed. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled.

### Swing

Shifts the timing of notes on even-numbered beats, which results in a “swing feeling”. Negative values shift the timing backward, and the notes are played earlier. Positive values shift the timing forward, and the notes are played later.

### Gate Scale

Allows you to shorten or lengthen the notes of the phrase. At a value of 100%, the notes play with their original gate length.

### Vel Scale

Allows you to raise or lower the note-on velocities of the phrase. At a value of 100%, the notes are played with their original velocity.

### Quantize

Allows you to set up a quantization grid in fractions of beats. You can also specify dotted and triplet values.

### Amount

Determines how much of the quantization grid is applied. For example, a value of 100% means that the MIDI note events play back only at the specified quantize note values. Lower values move the notes only partially towards the next quantize note value. With a value of 0%, no quantization is applied.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger phrase playback.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger phrase playback.

## Variations

For each module, you can set up eight different variations of phrases. You can switch between them with the variation buttons at the top right.

You can remote-control the variation buttons using the trigger pads, which gives you the possibility to switch between variations by playing the trigger keys that are assigned to the trigger pads.

### NOTE

To prevent switching to another variation in the middle of a beat or measure, use the trigger modes **Next Beat** or **Next Measure**.

---

## Creating Variations

### PROCEDURE

1. Click one of the eight variation buttons at the top right of the MIDI Player.
  2. You can either start from scratch or base the new variation on an existing variation.
    - To start from scratch, assign a phrase and edit the settings.
    - To use an existing variation as a base, use the context menu commands **Copy MIDI Player Variation** and **Paste MIDI Player Variation**.
- 

### RESULT

The variation can now be recalled by clicking the corresponding variation button.

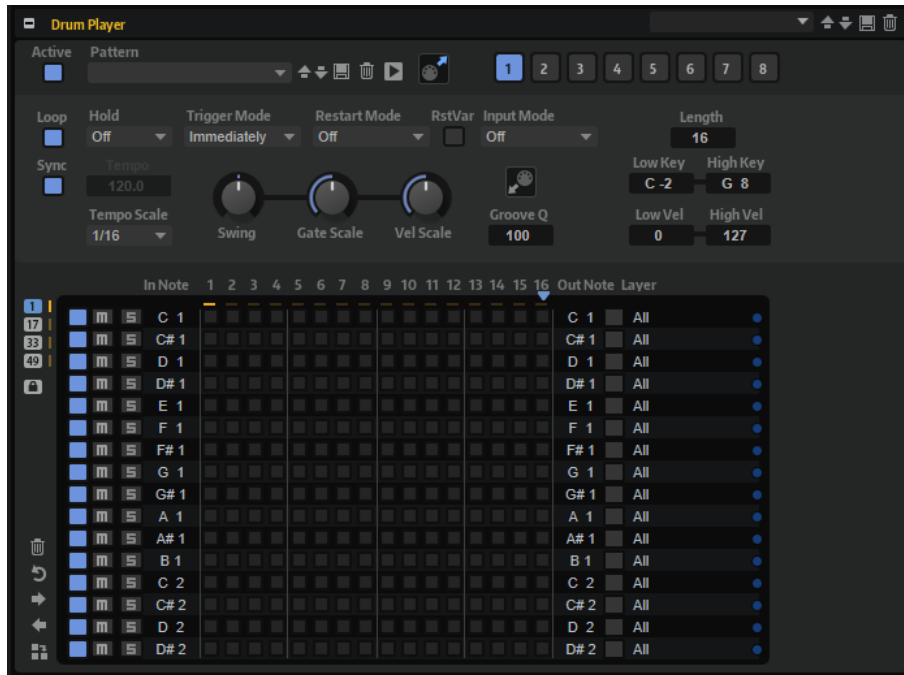
### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once for each inserted MIDI Player module.

---

## Drum Player

The Drum Player module allows for classic drum beat programming with up to 64 steps playing on up to 16 tracks. Each track can play a different sound.



You can set up eight different patterns using the variation buttons and use the Trigger Pads to switch between variations.

### Presets

Drum Player presets contain the selected MIDI phrases, as well as the performance settings of the Drum Player, such as **Tempo**, **Tempo Scale**, **Loop**, **Swing**, etc.

### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

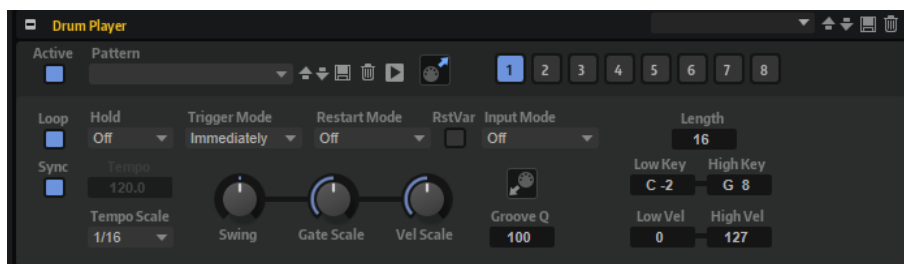
## Loading Patterns

Patterns are sorted into subfolders, according to their musical usage.

### PROCEDURE

- To load a pattern, click in the **Pattern** field, and select a pattern from the pop-up menu.

## Drum Player Parameters





### Active

Activates the Drum Player.

### Pattern

Allows you to select a pattern for the Drum Player.

### Save and Delete

The **Save** and **Delete** buttons to the right of the **Pattern** field allow you to save and delete patterns.

### Play/Stop

Allows you to play back the pattern. Click again to stop playback.

### MIDI Export

Allows you to export the phrase using drag and drop.

### Variation buttons

Allow you to create eight variations of your pattern.

### Loop

If this button is activated, the pattern plays back in a loop.

### Sync

Synchronizes the pattern to the tempo of your host application.

#### NOTE

In addition, you can set **Restart Mode** to **Sync to Host**. This aligns the pattern with the beats and measures of your host application.

---

### Tempo

If **Sync** is deactivated, you can use the **Tempo** control to set the internal playback speed of the Drum Player. The playback speed of the phrase is specified in BPM.

If **Sync** is activated, the **Tempo** parameter is not available.

### Tempo Scale

Defines the speed at which the pattern is running. You can specify a value in fractions of beats. You can also set dotted and triplet note values.

For example, if you change the **Tempo Scale** setting from 1/16 to 1/8, the speed is cut in half. If you set it to 1/32, the speed is doubled. Other values increase or decrease the speed accordingly.

### Hold

Allows you to prevent the pattern from stopping or changing when the keys are released.

- If **Off** is selected, the pattern changes as soon as you release a key. The pattern stops immediately when you release all keys.
- If **On** is selected, the pattern plays to the end, even if the keys are released. If **Loop** is activated, the pattern is repeated continuously.
- If **Gated** is selected, the pattern starts to play when the first key is played. It plays silently in the background, even if the keys are released, and resumes playback at the current position when you press any of the keys again. This way, you can gate the playback of the pattern.

### Trigger Mode

Determines at which moment the Drum Player changes the pattern when you switch to another variation.

- If this is set to **Immediately**, the pattern changes as soon as you switch to another variation.
- If this is set to **Next Beat**, the pattern changes on the first new beat after you switch to another variation.
- If this is set to **Next Measure**, the pattern changes at the first new measure after switching to another variation.

### Restart Mode

Determines whether the Drum Player is restarted when a note is triggered.

- If **Off** is selected, the player is not restarted if it is already running.
- **First Note** restarts the player if a note is triggered and no other notes are playing.
- **Each Note** restarts playback every time a note is triggered.
- **Sync to Host** aligns the playback with the beats and measures of your host application. Playback is synchronized every time you start the transport.
- **Follow Transport** follows the transport control of your host application. Playback starts and stops automatically as soon as your host application starts and stops playing.

### RstVar (Restart on Variation Change)

This option is available for new chords and new notes. If this button is activated, changing a variation restarts the Drum Player, even if no new notes or chords were triggered.

### Input Mode

Determines whether the black and white keys trigger or mute the assigned instrument.

- **Off** triggers the pattern with any key.
- **Trigger** triggers the note that is defined with the **Out Note** parameter. Playback uses the sound of the track. Keys that are not assigned to any **In Note** play back the pattern.
- **Mute** mutes the track for as long as the corresponding **In Note** key is held. Release the key to unmute the track again. Keys that are not assigned to any **In Note** play back the pattern.

### Length

Determines the length of the pattern, that is, the number of steps. The maximum number of steps is 64.

### Swing

Shifts the timing of notes on even-numbered beats. This way, the pattern gets a swing feeling. Negative values let the notes play earlier, positive values let the notes play later.

### Gate Scale

Allows you to shorten or lengthen the notes of the pattern. At a value of 100 %, the notes play with their original gate length.

#### NOTE

If the triggered samples are in **One-shot** mode, this parameter has no effect.

---

### Vel Scale

Allows you to raise or lower the note-on velocities of the pattern. At a value of 100 %, the notes play with their original velocity.

### Groove Quantize value field

Allows you to adapt the timing of a pattern to that of an external MIDI file by dropping this MIDI file on the **Groove Quantize** drop field. You can quantize the playback of the pattern to the timing of a sliced loop by dragging its MIDI file from the MIDI export drag field to the **Groove Quantize** drop field.

The **Groove Quantize Depth** parameter determines how accurately the pattern follows the timing of the MIDI file.

### Key Range

The **Low Key** and **High Key** parameters determine the key range that is used to trigger pattern playback.

### Velocity Range

The **Low Vel** and **High Vel** parameters determine the velocity range that is used to trigger pattern playback.

## Variations

For each module, you can set up eight different variations of patterns. You can switch between them with the variation buttons at the top right.

You can remote-control the variation buttons using the trigger pads, which enables you to switch between variations by playing the trigger keys that are assigned to the trigger pads.

#### NOTE

To prevent switching to another variation in the middle of a beat or measure, use the trigger modes **Next Beat** or **Next Measure**.

---

## Creating Variations

#### PROCEDURE

1. Click one of the eight variation buttons at the top right of the Drum Player.
  2. You can either start from scratch or base the new variation on an existing variation.
    - To start from scratch, assign a pattern, and edit the Drum Player settings.
    - To use an existing variation as a base, use the context menu commands **Copy Drum Player Variation** and **Paste Drum Player Variation**.
- 

#### RESULT

The variation can now be recalled by clicking the corresponding variation button.

#### NOTE

The parameters **Loop**, **Sync**, **Hold**, **Trigger Mode**, **Restart Mode**, **Input Mode**, **Low/High Key**, and **Low/High Vel** are not part of the variations. You set them up only once for each inserted module.

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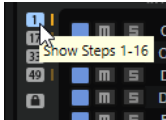
## Drum Player Pattern Editor

You can create and edit the patterns in the pattern editor in the lower section of the Drum Player.

### Pattern Editor Parameters


#### Page buttons

A pattern can contain up to 64 steps. The steps are distributed over four pages that you can access with the page buttons on the upper left of the editor.



During playback, the pages are switched automatically, so that the playback position is always displayed in the editor. Additionally, an indicator above the step display shows which step is being played.






#### Lock button

- To deactivate automatic page switching, activate the Lock  button below the page buttons.

If the Lock button is activated, you can still use the playback indicator to the right of the page buttons to see which page is being played.

#### Pattern functions buttons


The function buttons below the page buttons allow you to edit entire patterns.

- Click **Clear Pattern**  to delete all pattern steps in the editor.
- Click **Reverse Pattern**  to reverse the pattern.  
This mirrors the pattern around its middle step.
- To shift the rhythm of the phrase, click **Shift Pattern Left**  or **Shift Pattern Right** .  
If you shift the rhythm of the pattern to the left, the first step is moved to the end. If you shift the pattern to the right, the last step is moved to the beginning.
- Click **Duplicate Pattern**  to copy all events between the pattern start and end markers and paste them after the end marker.  
If any events are located after the end marker, they are deleted.

#### On/Off button

To activate a lane, activate its **On/Off**  button.

#### Mute

To mute a lane, activate its **Mute**  button.

#### Solo

To solo a lane, activate its **Solo**  button.

#### In Note

Determines which key is used to play the sound that is triggered by the track.

#### Out Note

Determines the note number that is used by the track to trigger notes.

#### Layer

Allows you to limit the track output to a specific layer. For this to work, the layer must be on the same level as the Drum Player module.

### Activity LED

The activity LED on the right lights up when an instrument is triggered, either by the playing track, the trigger button, or an incoming MIDI note.

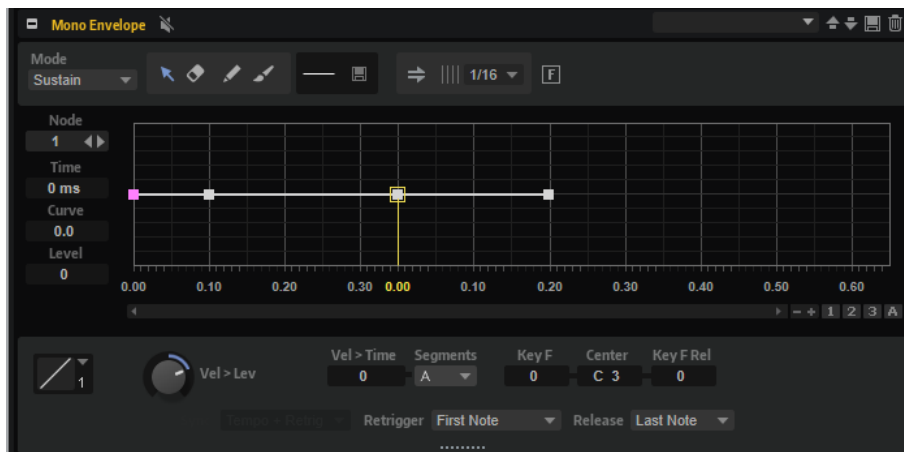
### Creating and Editing Patterns

- To add a step, click on a step field in the editor.
- To add all steps for a lane, hold down **Shift**, and click.  
To remove all steps, hold down **Shift**, and click again.
- To set the velocity for a step, click the step, and drag up or down, or use the mouse wheel.  
You can set each step to low, medium, or high velocity.
- To change the velocity of all steps in a lane, hold down **Shift**, and use the mouse.
- To remove a step, click it.
- To remove all steps in a pattern, click **Clear Pattern**.

## Mono Envelope

This MIDI module triggers a monophonic multi-segment envelope that you can use as a modulation source in the modulation matrix of a zone.

In this context, monophonic means that the envelope is not played back per zone. Instead, it is played back only once for the program or layer that it belongs to.



You can set up conditions for triggering and releasing the envelope. By default, this envelope is bipolar.

### RELATED LINKS

- [Modulation Sources](#) on page 210
- [Modulation Parameters](#) on page 208
- [Envelope Section](#) on page 185
- [Handling Section and Module Presets](#) on page 25

## Mono Envelope Parameters

### Mode

Determines how the envelope is played back when it is triggered.

- Select **Sustain** to play the envelope from the first node to the sustain node. The sustain level is held for as long as you play the note. When you release the note, the envelope continues with the stages following the sustain. This mode is ideal for looped samples.
- Select **Loop** to play back the envelope from the first node to the loop nodes. As a result, the loop is repeated for as long as you hold the key. When you release the note, the envelope continues playing the stages that follow the sustain. This mode is ideal for adding motion to the sustain of the envelope.
- Select **One Shot** to play the envelope from the first to the last node, even if you release the key. The envelope has no sustain stage. This mode is ideal for drum samples.

### Sync to Host Tempo

Allows you to synchronize the envelopes to the tempo of your host application.

### Fill

Allows you to add multiple envelope nodes after the selected nodes.

### Fixed Mode

- With **Fixed Mode** activated, only the selected nodes are moved when you move a node on the time axis.
- With **Fixed Mode** deactivated, all subsequent nodes are moved as well when you move a node.

### Env Node

Displays the active envelope node. To select a node, enter its number in the field. To step through the nodes, use the **Previous Node/Next Node** buttons.

### Time

Specifies the period of time between two nodes. Depending on the **Sync** mode, the **Time** parameter is displayed in milliseconds and seconds, or in fractions of beats.

#### NOTE

The fraction is always reduced to the smallest possible value. 2/16 is displayed as 1/8, for example.

---

### Curve

Allows you to adjust the curvature between two nodes from linear to logarithmic or exponential behavior.

### Level

Specifies the amplitude of the envelope at the position set by the **Time** parameter.

### Trigger Mode

Sets the condition for triggering the envelope.

- Select **First Note** to trigger the envelope with the first note that you play. Any subsequent notes that you play legato do not trigger the envelope.
- Select **Each Note** to trigger the envelope with each note that you play. The envelope plays back from its attack each time you press a key.

### Release Mode

Sets the condition for releasing the envelope.

- Select **First Note** to release the envelope with the first note that you release.

- Select **Last Note** to release the envelope with the last note that you release.

### Level Velocity

Determines how the velocity affects the level of the envelope.

The level of the envelope depends on two factors: the setting of this parameter and how hard you hit a key. With positive values, the harder you hit a key, the higher the level of the envelope. With negative values, the harder you hit a key, the lower the level of the envelope.

### Level Velocity Curve

Specifies how the incoming velocity translates to the level of the envelope.

The characteristics of each curve are represented by a small icon.

### Time Velocity

Adjusts the influence of velocity on the phases of the envelope. Positive values decrease the length of the phases for higher velocity values. Negative values increase the length of the phases for higher velocity values.

### Segments Affected by Time Velocity

Allows you to select the phases of the envelope to be affected by the **Time Velocity** parameter.

- **Attack** – The velocity affects the attack only.
- **Attack + Decay** – The velocity affects all phases up to the sustain phase.
- **Decay** – The velocity affects all phases including the sustain phase, but without the attack.
- **Attack + Release** – The velocity affects the attack and the release phases.
- **All** – The velocity affects all phases.

### Time Key Follow, Center Key, and KeyF Rel (Key Follow Release)

With the **Time Key Follow** and **KeyF Rel** parameters, you can scale the envelope phases across the keyboard.

- **Time Key Follow** scales all times before the sustain node.
- **KeyF Rel** scales all times after the sustain node, that is, the release phase of the envelope.

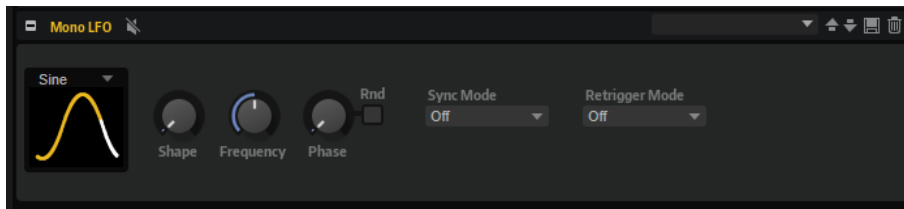
The value that you specify for **Center Key** is used as the central position for the **Time Key Follow** and **KeyF Rel** functions.

The envelope phases depend on the keyboard range in which the note is played and on the corresponding **Time Key Follow** setting:

- Positive values decrease the phase lengths for notes above and increase the phase lengths for notes below the **Center Key**, that is, the higher the notes you play, the faster the envelope.
- Negative values increase the phase lengths for notes above and decrease the phase lengths for notes below the **Center Key**, that is, the higher the notes you play, the slower the envelope.

## Mono LFO

You can add monophonic LFOs to the program as MIDI modules. An LFO module can be used for an entire program or for specific layers.



In this context, monophonic means that these LFOs are only calculated once and feed multiple voices at the same time. A pitch modulation controlled by the modulation wheel is a typical example of one LFO controlling the vibrato for all voices. Monophonic LFOs appear as sources in the modulation matrix of the zones contained in a layer or program.

- To bypass the LFO, click the **Bypass** button in the title bar.

#### NOTE

This deactivates all LFOs.

---

#### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## Mono LFO Parameters

### LFO Wave Shape

**Waveform** selects the basic type of waveform. **Shape** changes the characteristics of the waveform.

- **Sine** produces smooth modulation, suitable for vibrato or tremolo. **Shape** adds additional harmonics to the waveform.
- **Triangle** is similar to **Sine**. **Shape** continuously changes the triangle waveform to a trapezoid.
- **Saw** produces a ramp cycle. **Shape** continuously changes the waveform from ramp down to triangle to ramp up.
- **Pulse** produces stepped modulation, where the modulation switches abruptly between two values. **Shape** continuously changes the ratio between the high and low state of the waveform. If **Shape** is set to 50%, a square wave is generated.
- **Ramp** is similar to the **Saw** waveform. **Shape** adds a gradually increasing amount of silence before the sawtooth ramp up begins.
- **Log** produces a logarithmic modulation. **Shape** continuously changes the logarithmic curvature from negative to positive.
- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.
- **S & H 2** is similar to **S & H 1**. The steps alternate between random high and low values. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal, with the control set fully to the right.

### Sync Mode

You can sync the LFO either to the tempo of the host application or to the Step Modulator. The behavior of the **Frequency** parameter depends on the option you select:

- Select **Off** to adjust the speed of the modulation in Hertz.



- Select **Tempo + Retrig** to adjust the speed of the modulation in fractions of beats. You can also set dotted and triplet note values.  
The restart behavior of the LFO depends on the **Retrigger** setting.
- Select **Tempo + Beat** to adjust the speed of the modulation in fractions of beats. You can also set dotted and triplet note values.  
The LFO restarts with the transport of the host and aligns with the beats of the project. The **Retrigger** setting is not taken into account.

### Retrigger Mode

Determines whether the LFO is restarted when a note is triggered. If this is set to **First Note** or **Each Note**, the waveform starts at the position specified by the **Phase** parameter.

- If this is set to **Off**, the LFO runs freely.
- If this is set to **First Note**, the LFO restarts when a note is triggered and no other notes are held.
- If this is set to **Each Note**, the LFO restarts each time a note is triggered.

### Frequency

Controls the frequency of the modulation, that is, the speed of the LFO. If **Sync Mode** is active, the frequency is set in fractions of beats, or the number of steps of the Step Modulator.

### Phase

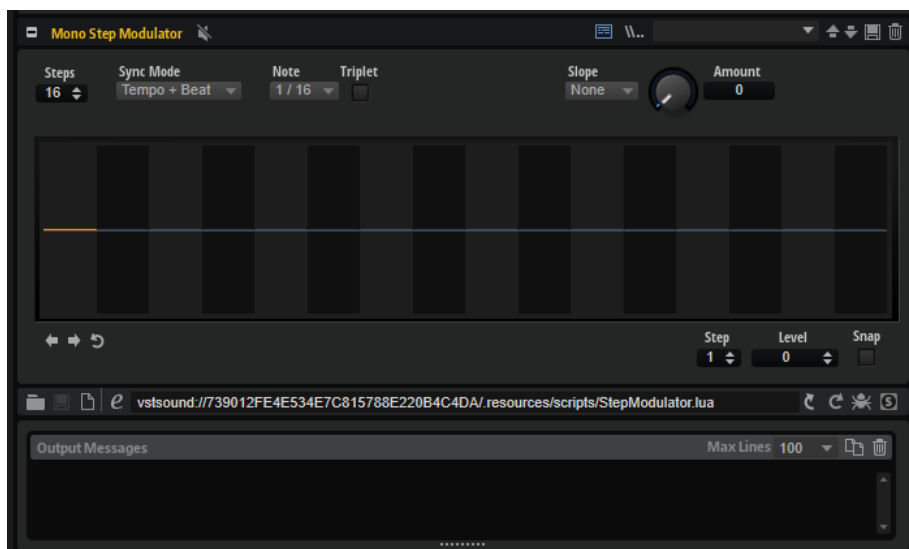
Sets the initial phase of the waveform that is used when the LFO is retriggered.

### Random

Causes each note to start with a randomized start phase. The **Phase** control is deactivated.

## Mono Step Modulator

You can add the step modulator to the program as a MIDI module and use it as a modulation source in the modulation matrix of a zone.



### RELATED LINKS

[Step Modulator](#) on page 201

## Mono Step Modulator Parameters

### Steps

Sets the number of steps in the sequence. The maximum number of steps is 32.

### Sync Mode

- **Off** allows you to adjust the speed at which the sequence repeats.  
Whether the sequence restarts when you play a note depends on the **Retrigger Mode**.
- **Tempo + Retrig** allows you to adjust the length of the steps in fractions of beats. The speed of the modulation depends on the number of steps, the note value, and the tempo you set in your host application. To use triplet note values, activate **Triplet**.  
Whether the sequence restarts when you play a note, depends on the selected **Retrigger Mode**.
- **Tempo + Beat** allows you to adjust the length of the steps in fractions of beats. The speed of the modulation depends on the number of steps, the note value, and the tempo you set in your host application. To use triplet note values, activate **Triplet**.  
The sequence restarts with the transport of the host application and lines up to the beats of the project. **Retrigger Mode** is not taken into account.

### Frequency

If **Sync Mode** is set to **Off**, this controls the speed at which the sequence is repeated.

### Note

If **Sync Mode** is set to one of the **Tempo** settings, this adjusts the length of the steps in fractions of beats. You can also select triplet values.

### Triplets

Activate this button to use triplet note values.

### Retrigger Mode

Determines whether the sequence restarts when you play a note. This parameter is only available if **Sync Mode** is set to **Off** or **Tempo + Retrig**.

- If this parameter is set to **Off**, the sequence is not restarted. Instead, it resumes playback at the position where you released the key.
- If this parameter is set to **First Note**, the sequence restarts when a note is triggered and no other notes are held.
- If this parameter is set to **Each Note**, the sequence restarts each time a note is triggered.

### Slope

Determines whether the step modulator jumps from step to step or creates ramps between the steps.

- **No Slope** produces hard steps.
- **Slope on Rising Edges** creates ramps for rising edges only.
- **Slope on Falling Edges** creates ramps for falling edges only.
- **Slope on All Edges** creates ramps for all edges.

### Amount

If **Slope** is set to **Slope on Rising Edges**, **Slope on Falling Edges**, or **Slope on All Edges**, this parameter determines the time of the ramp between two steps. The higher the setting, the smoother the transitions between steps.

### Step

Allows you to select a specific step.

### Level

Shows the level of the selected step.

### Snap

If **Snap** is activated, the level of each step can only be adjusted in steps of 1/12th.

### Shift Pattern Right/Shift Pattern Left

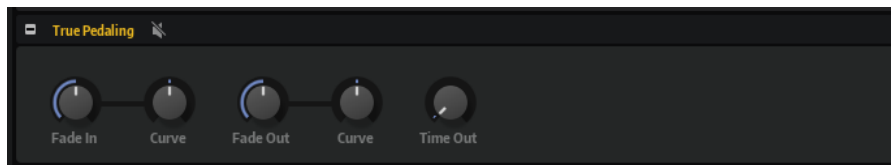
Shift all the steps to the right/left. If you shift the pattern to the left, the first step is moved to the end. If you shift the pattern to the right, the last step is moved to the beginning.

### Reverse Pattern

Reverses the pattern, that is, inverts the order of all steps.

## True Pedaling

This MIDI module produces a modulation signal from the sustain pedal that you can use to simulate true pedaling of grand pianos. Instead of switching between two layers, this module allows you to crossfade between layers when you press or lift the sustain pedal, which produces a more realistic sound.



## True Pedaling Parameters

### Fade In Time

Specifies the fade in time of the modulation signal. The fade in time is applied when you press the sustain pedal.

### Fade In Curve

Sets the curvature of the fade in. Use negative values for an outward-shaped curve and positive values for an inward-shaped curve.

### Fade Out Time

Specifies the fade out time of the modulation signal, when you lift the sustain pedal.

### Fade Out Curve

Sets the curvature of the fade out. Use positive values for an outward-shaped curve and negative values for an inward-shaped curve.

### Time Out

Sets a time limit for the sustain pedal effect. On acoustic pianos, pressing the sustain pedal after a period of time has little to no effect. You can achieve the same effect by using this parameter: Pressing the sustain pedal after the time that you set here has

no effect. Any resonance samples that have been triggered, but were not faded in, are released.

## Setting up a Crossfade between Two Layers

---

### PROCEDURE

1. Set the **Level** parameter of the zones with the note-on samples to 0 dB.
  2. Set the **Level** parameter of the zones with the sustain resonance samples to the minimum setting.
  3. In the modulation matrix, select the True Pedaling module as modulation source and assign it to the **Level** modulation destination.
  4. For the crossfade to take effect, modulate the level of the note-on samples in negative direction and the level of the sustain resonance samples in positive direction.
- 

### RESULT

The resonance samples are triggered with each note, but they are only heard if you press the sustain pedal.

## MegaTrig

The MegaTrig module allows you to control playing styles and articulations and to trigger release samples and instrument noises by setting up conditions. You can combine up to eight conditions into an expression using logical operations.



## Setting up Conditions

By setting up conditions, you can determine which zone to trigger.

### PREREQUISITE

- You have inserted the MegaTrig module at the position where you want to apply the condition.  
This can be the program or one of its layers. All zones within a program or layer are affected.
- The **MIDI Modules Editor** shows the MegaTrig module.

**NOTE**

It is possible to set up expressions that cannot be true, such as “Note-on AND Note-off”, “Note-on AND Key up”. Be sure to verify that your expressions can be true.

---

**PROCEDURE**

1. From the **Condition** pop-up menu for the first condition row, select an event.  
For example, select **Note-Off** to trigger new samples when a key is released.
2. Activate the condition by clicking its **On/Off** button on the left.
3. Use the **Range** controls on the right to adjust the range of the notes that trigger the condition.
4. Optional: To set up more conditions, repeat these steps for additional rows.
5. Select the logical operations, **AND** or **OR**, from the menu to the left of the conditions. To invert a condition, activate the **NOT** operation.  
For example, the expression “Note-on AND Sustain On” is true if you play notes while holding down the sustain pedal.

**NOTE**

The operation **AND** is executed before the operation **OR**.

---

6. Use the **Trigger** option to specify which notes are triggered when the expression becomes true, that is, when the conditions are met.
  7. Optional: Set up the parameters in the **Note-off Velocity** section.
- 

**RELATED LINKS**

[MegaTrig Conditions](#) on page 658

[MegaTrig Parameters](#) on page 655

## MegaTrig Parameters

In the upper section of the MegaTrig editor, you set up the condition, and in the lower section, you can make further settings for the condition.



### Operator

Logically combines two conditions.

- If **AND** is selected, the condition is true if both conditions are true.
- **OR** combines two conditions logically. The expression is true if one of the conditions is true.

### Not

Inverts the condition. A condition that was previously true becomes false, and vice versa.

### On

Activates the corresponding condition.

### Condition

Sets the event for the condition that you specify. The condition is true if the event is of the correct type and within the specified range.

### Min

Sets the lowest value for a true condition. Use the arrow buttons, the value field, or the range fader to adjust the minimum value of the range.

### Range

Shows the range for the condition.

### Max

Sets the highest value for a true condition. Use the arrow buttons, the value field, or the range fader to adjust the maximum value of the range.



### Expression

The **Expression** field displays the set conditions and logical operations.

Click the edit button to edit the expression manually. Use parentheses to specify the execution order.

### Trigger Options

- If **New Notes** is selected, only new notes trigger the zones if the expression is true.
- If **Held Notes** is selected, held notes and new notes trigger the zones if the expression is true.

#### NOTE

**Held Notes** and **New Notes** trigger the notes as you play them on the keyboard.

- If **Fixed Note** is selected, a specific note is triggered if the expression is true. You can specify this note with the **Note** and **Velocity** parameters.  
You can use this to trigger sample zones that are not mapped to the different keys but to a specific MIDI note, for example, to trigger the pedal noise of a piano.

### Note-Off Velocity

The parameters below the trigger options control the velocity of note-off samples.

The velocity can also have an effect on the level of the note-off samples, as programmed in the zone.

### Source

Determines whether the velocity that is sent to the release samples is taken from the note-on or the note-off event.

#### NOTE

If your keyboard does not send note-off events, set this parameter to **Note-On** so that the note-off sample plays with the same velocity as the note-on sample.

---

#### Velocity Amount

Sets the amount of the note-off velocity decay.

#### Decay

Allows you to configure a gradual decay of the note-off velocity over time.

#### Decay Curve

Sets the curvature of the note-off velocity decay.

Use positive values for an outward-shaped curve and negative values for an inward-shaped curve. Without changing the overall decay time, an outward-shaped curve reduces the note-off velocity faster, and an inward-shaped curve reduces it more slowly.

#### Decay Key Follow

Allows you to scale the decay time based on the pitch.

You can set a center key that is used as the central position for the **Key Follow** function. For example, set this parameter to positive values to decrease the decay time for notes above and to increase it for notes below the center key.

#### Decay Center Key

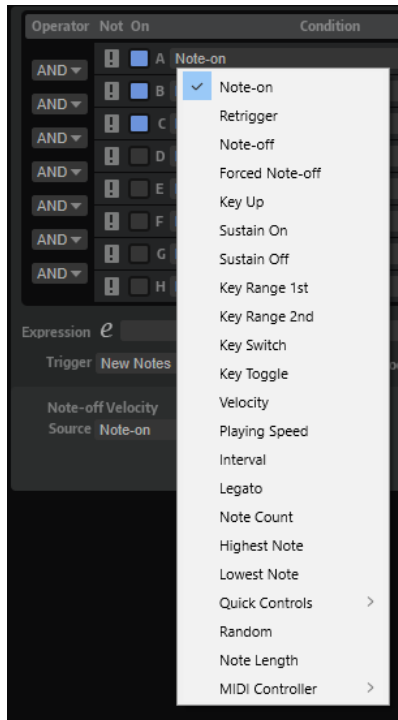
Specifies the note number that is used as a central position for the **Decay Key Follow** function.

#### RELATED LINKS

[Setting up the Expression Manually](#) on page 660

## MegaTrig Conditions

From the **Conditions** pop-up menu, you can select the events for your condition.



### Note-on

This condition is true if a key is pressed.

You can specify a key range for this event with the controls on the right.

### Retrigger

This condition is true if a note is retriggered. You can specify a key range for the retriggered note.

#### NOTE

This condition must be combined with **Note-on**, and **Mono** and **Retrigger** must be activated in the **Voice Management** section of the corresponding layer or program.

---

### Note-off

This condition is true if a key is released. This is either the case if a note-off event is received that has a matching note-on event or if the sustain pedal is lifted.

You can specify a key range for this event with the controls on the right.

#### NOTE

This helps you to trigger the correct release samples when switching between the articulations of an instrument. For this to work, the layers of the note-on and note-off samples must reside in the same layer of the corresponding MegaTrig module for the key switch.

---

### Forced Note-off

This condition is true if a note is released. Forced means that a matching note-on event is not needed. In other words, the note-off event always passes through. This includes



notes that are released by lifting the sustain pedal. You can specify a key range for the note-off events.

#### **Key Up**

This condition is true if a note is released, even if the sustain pedal is pressed. This condition uses the full range of the keyboard.

#### **Sustain On**

This condition is true if the sustain pedal is pressed.

#### **Sustain Off**

This condition is true if the sustain pedal is released.

#### **Key Range 1st**

This condition is true as soon as the first note within the specified note range is held.

#### **Key Range 2nd**

This condition is true as soon as the second note within the specified note range is held.

#### **Key Switch**

This condition is true if a key in the specified key range is pressed. Multiple key switch assignments across different layers of the program work like radio buttons, that is, only one key switch assignment can be active at a time. By default, the key switch assignment with the lowest key is true.

#### **NOTE**

If you want the key switch assignments across different layers to work individually, activate **Individual MegaTrig Management** for the corresponding layers. This may be necessary if two programs with key switches are copied into one program at the same time, for example.

---

#### **Key Toggle**

This condition switches between true and false each time that you hit a key within the specified note range. By default, the condition is true. If you switch the condition starting from 0, the odd numbers are false, and the even numbers are true.

#### **Velocity**

This condition is true if the received velocity is within the specified velocity range.

#### **Playing Speed**

The condition is true if the time between successive notes is within the specified range.

#### **Interval**

This condition is true if the interval between successively played notes is within the specified range.

#### **Legato**

This condition is true if you play notes legato. You can specify a key range for the legato notes.

#### **Note Count**

This condition is true if the number of played notes is within the specified range.

#### **Highest Note**

This condition is true if the played notes match the specified range. The **Range** control specifies the order of the notes in a chord from high to low.

For example, a range from 0 to 1 means that the first and second highest notes play and that all other notes are filtered out.

#### Lowest Note

This condition is true if the played notes match the specified range. The **Range** control specifies the order of the notes in a chord from low to high.

For example, a range from 0 to 1 means that the first and second lowest notes play and that all other notes are filtered out.

#### Quick Controls

This condition is true if the quick control is within the specified range.

#### Random

Produces a random value between 0 and 100 for each note that is played. This condition is true if the random value is within the specified range.

#### NOTE

If you use several MegaTrig modules, you can use the same random value across all modules by selecting **Random** for the same MegaTrig row. By setting the ranges so that they do not overlap, you can switch randomly between the corresponding layers.

---

#### Note Length

This condition is true if the note length is within the specified range.

#### MIDI Controller

This condition is true if the controller is within the specified range.

## Setting up the Expression Manually

Instead of using the **AND/OR** menus and **NOT** buttons, you can enter the expression manually. This way, you can also influence the execution order of the expression.

---

#### PROCEDURE

1. Click the edit button next to the **Expression** field.
2. Enter the conditions and logical operations, for example **A AND B OR C**.  
Instead of **AND**, **OR**, and **NOT**, you can also type **&**, **|** and **!**.
3. Use parentheses to specify the execution order, for example **A AND (B OR C)**.

#### NOTE

If you edit the expression manually, the **AND/OR** menus and the **NOT** and **On** buttons are not available.

---

## Triggering Note-Off Samples

You can emulate the decaying of a note, for example, a piano note, by triggering a note-off sample when a key is released.

#### PREREQUISITE

- The program includes a layer that contains the note-on samples and another layer that contains the note-off samples.

- The note-on samples and the note-off samples are mapped to the same key range, that is, for each note-on sample, a corresponding note-off sample is available.

---

#### PROCEDURE

1. Insert the MegaTrig module for the layer with the note-off samples.
2. Open the **MIDI Modules Editor** for this layer, so that the MegaTrig control panel is shown.
3. Set the first condition to **Note-off**.  
This way, a new note is triggered when a key is released.
4. Activate the **Enable/Disable Condition** button in the **On** column.  
Now, when a note within the set range is released, a new sample from the note-off layer is triggered.
5. On the **Trigger** pop-up menu, select **New Notes**.  
This way, the condition is evaluated every time a new note is played.
6. On the **Note-Off Velocity Source** pop-up menu, select **Note-on**.  
This way, the velocity of the note-off sample is the same as the one of the note-on sample. If you use a keyboard that is capable of sending note-off velocity, you can set this to **Note-off**.
7. Optional: Set up the decay in the following way:
  - Specify a decay time for the note-off sample with the **Decay** control.
  - Specify the amount of decay with the **Amount** control.
  - Specify a decay curve with the **Curve** control.
  - Use the **Key Follow** control and **Center Key** value field to control the decay time with the pitch of the note that you play.

---

#### RESULT

When you now play a note-on sample and release the key, the corresponding note-off sample is played.

## Triggering Pedal Noise Samples

You can use the MegaTrig module to trigger pedal noise samples for your piano notes.

#### PREREQUISITE

- The program contains the piano samples and the pedal noise sample.
- The pedal noise sample is mapped to a key outside the range that is used to trigger piano samples, to prevent accidental triggering while playing.

---

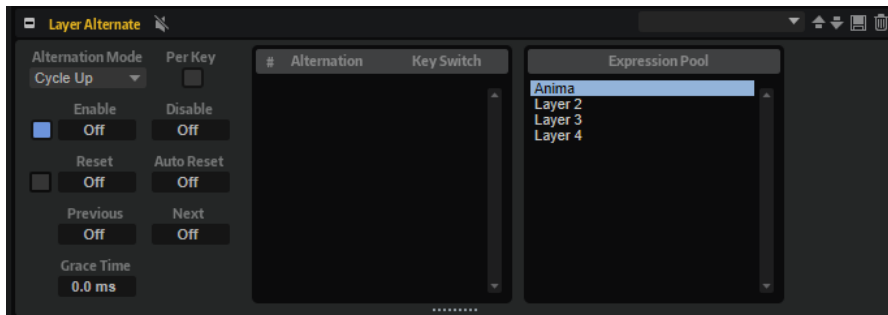
#### PROCEDURE

1. Insert the MegaTrig module.
2. Open the **MIDI Modules Editor** for this layer, so that the MegaTrig control panel is shown.
3. Set the first condition to **Note-on**.
4. Set the second condition to **Sustain On**.
5. Activate both conditions, and set the operator to **AND**.  
Now, the condition is true if a note is played and the sustain pedal is pressed.
6. Set the **Trigger** pop-up menu to **Fixed Note**.

7. Specify the pitch and the velocity of the key that triggers the pedal noise sample via the **Note** and **Velocity** controls.
- 

## Layer Alternate

You can use this module to automatically switch between different layers. This is useful for alternating between the up and down bows of a string instrument or the left and right hand of drum strokes, for example.



### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## Alternating between Layers

---

### PROCEDURE

1. In the **Program Tree**, insert the Layer Alternate module above the layers between which you want to switch.
2. Open the editor for the module, and drag the layers from the **Expression Pool** into the **Allegation List**, in the order in which you want them to alternate.  
You can rearrange the order of the list via drag and drop. To remove a layer from the list, use the context menu.
3. Select the **Allegation Mode**, make sure that **Enable** is activated, and start playback.

### NOTE

Depending on the selected **Allegation Mode**, the layers either alternate in the order listed or in a random manner.

---

### RESULT

Playback alternates between the layers. The layer that is played back is highlighted.

### NOTE

Layer Alternate can only be used to switch between layers. For switching between zones, use variation groups.

---

### RELATED LINKS

[Variation Groups Section](#) on page 111

## Using Key Switches

Key switches allow you to switch to a particular layer, regardless of the current position in the **Alternation List**.

You can specify a key switch for each layer in the **Alternation List**. As soon as the corresponding note is played, the **Alternation List** jumps to the new layer. The alternation then continues from that position.

To specify a key switch for a layer, enter the note, as text or as a number, in the corresponding key switch column of the **Alternation List**.

## Layer Alternate Parameters

### Expression Pool

Shows the available layers.

### Alternation List

Shows the layers that are used by Layer Alternate. The layer that is played back is highlighted.

You can change the order of the layers by dragging them to a new position. To remove a layer from the **Alternation List**, use the context menu for the selected key switch.

### Alternation Mode

- Select **Cycle Up** to cycle through the layers in the **Alternation List** in ascending order, that is, from the lowest index number upwards.
- Select **Cycle Down** to cycle through the layers in the **Alternation List** in descending order, that is, from the highest index number downwards.
- Select **Random** to alternate the layers randomly with each note that you play.
- Select **Random Exclusive** to alternate the layers randomly, but without repetitions.

### Per Key

Allows you to apply the alternation for each MIDI key separately. If this option is deactivated, the alternation is applied globally across the entire keyboard, so that any key that you play advances the alternation sequence.

### Enable/Disable

The two value fields allow you to specify the MIDI keys that enable/disable the alternation sequence.

If no key is specified in the **Disable** field, the key in the **Enable** field is used to enable and disable the alternation sequence.

#### NOTE

The keys that are specified for **Enable** and **Disable** are used exclusively for these functions and cannot trigger any notes.

---

If this is set to **Off**, playback remains on the selected layer.

You can also use the **On/Off** button to the left of the value fields to activate/deactivate the alternation sequence.

### Reset

Specifies the key that resets the alternation sequence.

### Auto Reset

Allows you to automatically reset the layer alternation after a specific time.

### Previous

Specifies the key that switches to the previous entry in the list.

### Next

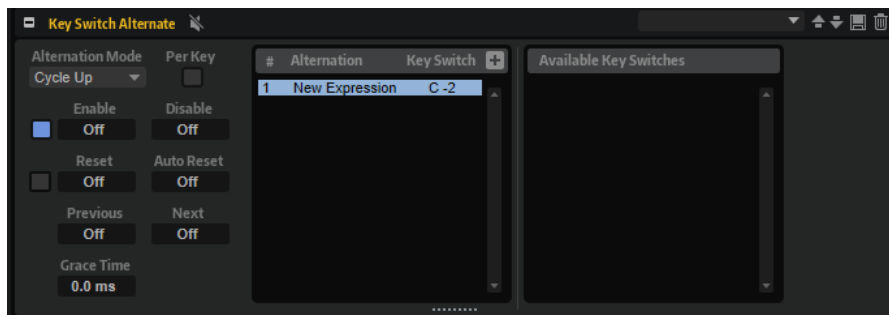
Specifies the key that switches to the next entry in the list.

### Grace Time

Sets the minimum time between two steps. This allows you to play chords, for example, because otherwise, each note of a chord would play a different layer.

## Key Switch Alternate

This module allows you to automatically switch between different layers that are using MegaTrig key switches.



Key Switch Alternate is provided for compatibility with HALion 3 programs. In HALion 3, the alternation between layers was initiated using key switches. With the current program version, use the Layer Alternate module instead.

### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## Alternating Key Switches

---

### PROCEDURE

1. In the **Program Tree**, insert the Key Switch Alternate module above the layers that contain the MegaTrig modules with key switch settings.
2. Open the editor for the module, and drag the key switches from the **Available Key Switches** list to the **Alternation List** in the order in which you want them to alternate.  
You can rearrange the order of the list via drag and drop. To remove a key switch from the list, use the context menu.
3. Select an alternation mode, make sure that **Enable** is activated, and start playback.

### NOTE

Depending on the selected **Alternation Mode**, the triggered key switches either alternate in the order listed or in a random manner.

---

#### RESULT

Playback alternates between the different key switches. The key switch that is triggered is highlighted.

## Key Switch Alternate Parameters

### Available Key Switches

Shows the available key switches.

### Alternation List

Shows the key switches that are used to control an alternation.

You can change the order of the key switches by dragging them to a new position. To remove a key switch from the **Alternation List**, use the context menu for the selected key switch.

### Alternation Mode

- Select **Cycle Up** to cycle through the key switches in ascending order, that is, from the lowest index number upwards.
- Select **Cycle Down** to cycle through the key switches in descending order, that is, from the highest index number downwards.
- Select **Random** to alternate the key switches randomly with each note that you play.
- Select **Random Exclusive** to alternate the key switches randomly, but without repetitions.

### Per Key

Allows you to apply the alternation for each MIDI key separately. If this option is deactivated, the alternation is applied globally across the entire keyboard, so that any key that you play advances the alternation sequence.

### Enable/Disable

The two value fields allow you to specify the MIDI keys that enable/disable the alternation sequence.

If no key is specified in the **Disable** field, the key in the **Enable** field is used to enable and disable the alternation sequence.

#### NOTE

The keys that are specified for **Enable** and **Disable** are used exclusively for these functions and cannot trigger any notes.

---

If this is set to **Off**, you can manually trigger a specific key switch by clicking it in the **Alternation List**.

You can also use the **On/Off** button to the left of the value fields to activate/deactivate the alternation sequence.

### Reset

Specifies the key that resets the alternation sequence.

### Auto Reset

Allows you to automatically reset the key switch alternation after a specific time.

### Previous

Specifies the key that switches to the previous entry in the list.

### Next

Specifies the key that switches to the next entry in the list.

### Grace Time

Sets the minimum time between two steps. This allows you to play chords, for example, because otherwise, each note of a chord would play a different layer.

## Manually Adding Alternations

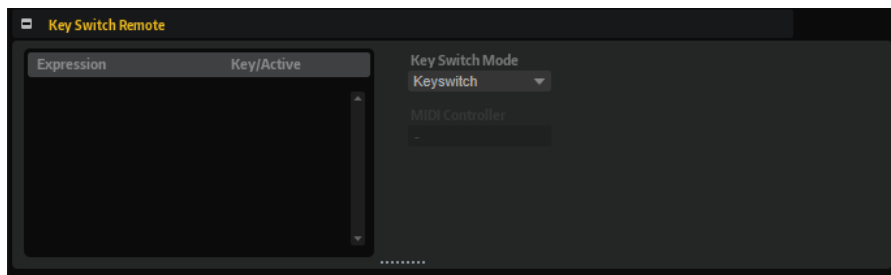
---

### PROCEDURE

1. Click the + button above the **Alternation List**.
  2. Specify the name of the alternation.
  3. Specify the key switch note to be sent.
- 

## Key Switch Remote

The Key Switch Remote module allows you to remote-control key switches that are used within the parent layer.



## Key Switch Remote Parameters

### Expression list

The expression list shows all available layers. If a layer contains a MegaTrig module that is set to **Key Switch**, the specified key is displayed in the **Key/Active** column.

### Key Switch Mode

Allows you to determine whether the key switches are used as they were set up in the MegaTrig modules, remapped to other keys, or whether you want to use a MIDI controller instead.

#### NOTE

Regardless of the selected mode, the original key switch assignments still work. The last key switch that is received always has priority.

---

- If **Key Switch** is selected, the original key switch assignments are used to switch to an expression.  
The keys are displayed in the list and cannot be edited.
- If **Remapped** is selected, you can transpose the original key switch assignments to the playable range of your MIDI keyboard.



To do so, enter the MIDI note that you want the expression to be reassigned to. You can also transpose multiple key switches at the same time by pressing **Shift** and dragging one of the faders for the key switch that you want to change.

#### NOTE

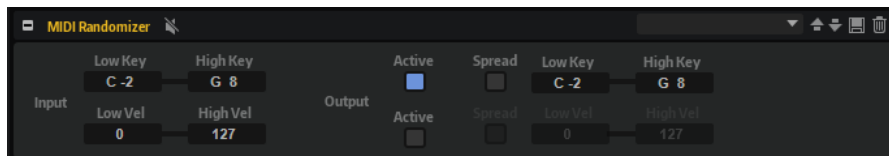
MIDI notes that are used for key switches can no longer be used to trigger samples.

- If **Controller** is selected, you can select a MIDI controller that remote-controls the original key switches.

The list does not show any MIDI note names, but checkboxes that allow you to specify the expressions that you can switch to. Inactive expressions cannot be addressed.

## MIDI Randomizer

The MIDI Randomizer module allows you to randomly trigger notes.



The notes that are used by the MIDI Randomizer can be created by modifying the original notes and/or velocity values via an adjustable deviation amount, or within a completely independent range that can be set for key and/or velocity. You can also limit the input range for incoming MIDI notes to specify the notes for the module to react to.

#### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## MIDI Randomizer Parameters

### Input Section

In the **Input** section on the left, you can make the following settings:

#### Low Key/High Key

These values define which incoming notes are used to create random notes.

#### Low Vel/High Vel

These values define the velocity range that is used to create random notes.

### Output Section

In the **Output** section to the right, there are two rows of settings.

The upper row contains the key range parameters.

#### Active

If this option is activated, the MIDI Randomizer creates notes within the key range, as specified by the **Low Key** and **High Key** parameters.

### Spread

If this option is activated, the input values are varied randomly. Use the **Amount** parameter to define to what degree the random notes are allowed to diverge from the original keys.

The lower row contains the velocity range parameters.

### Active

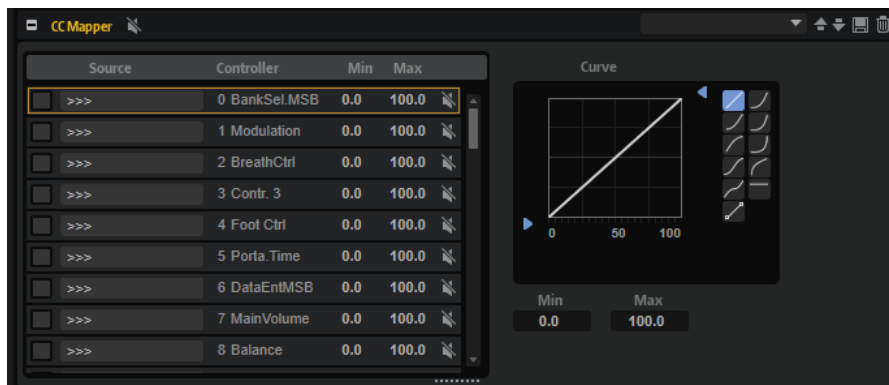
If this option is activated, the MIDI Randomizer creates notes within the velocity range, as specified by the **Low Vel** and **High Vel** parameters.

### Spread

If this option is activated, the input values are varied randomly. Use the **Amount** parameter to define to what degree the random notes are allowed to diverge from the original keys.

## CC Mapper

This MIDI module allows you to map MIDI controllers to other MIDI controllers before they are passed on to the following layers and zones. You can also use it to transform incoming values using curves.



MIDI controllers, aftertouch, and pitchbend can be freely mapped to all MIDI controllers, aftertouch, pitchbend, and the eight global controllers, that is, **Contr. A** to **Contr. H**.

The global controllers allow you to change the MIDI controller assignment via a single setting in the CC Mapper, instead of changing the modulation matrix assignments of the zones separately, for example. This can be achieved by assigning them in the modulation matrix and mapping a MIDI controller or velocity to them using the CC Mapper.

#### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## CC Mapper Parameters

### Source

Determines the source controller to be remapped.

### Controller

Lists the available destination controllers.

### Bypass

Deactivates the remapping for a controller.

### Min

Determines the minimum value to be sent.

### Max

Determines the maximum value to be sent.

## Curve and Range Editor

You can set up a curve and a range for each remapped source. The curve and range editor displays the settings of the selected source controller, represented by an orange frame.

To select a different source, click the button to the left of it.

### Curve Types

You can use one of the available curve types or create your own custom curves.

### Custom curves

To set up your own curve, select the **Custom** preset.

- To insert a node, double-click in the editor.
- To delete a node, double-click it.
- To adjust the shape of the curve, drag the nodes.
- To change the curvature, drag the lines between the nodes up or down.

### Min/Max

The minimum and maximum values define the range for the output of the function. The values correspond to the **Min** and **Max** columns in the list on the left.

## Remapping Controllers

---

### PROCEDURE

1. To map a MIDI controller to another MIDI controller, aftertouch, or pitchbend, click in the **Source** column for the MIDI controller, and select the controller that you want to remap.
2. In the **Controller** column, select the destination, that is, the controller that you want the controller to be remapped to.

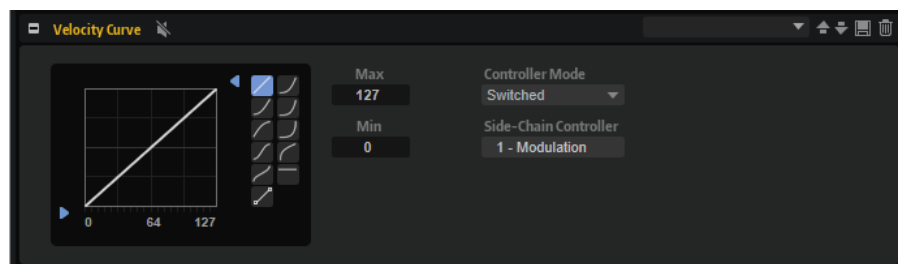
### NOTE

Velocity and the global controllers themselves can only be mapped to the global controllers.

---

## Velocity Curve

The Velocity Curve module allows you to map incoming velocity values to different output values via an adjustable curve.



You can also use this module to limit the output velocity range, or use its side-chain controller input to control the effect of the curve via a MIDI controller.

RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## Velocity Curve Parameters

### Curve display

Allows you to use one of ten preconfigured curve types or create a custom curve. To select a curve type, click on one of the buttons to the right of the curve display.

### Custom curve

Allows you to set up your own curve by selecting the **Custom** preset.

- To insert a node, double-click in the editor.
- To delete a node, double-click it.
- To adjust the shape of the curve, drag the nodes.
- To change the curvature, drag the lines between the nodes up or down.

### Min/Max

Allow you to specify the output velocity. The curve is compressed accordingly.

### Controller Mode

Allows you to control the effect of the curve dynamically.

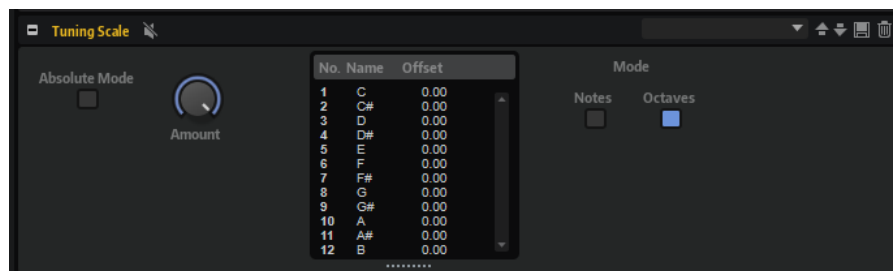
- If this is set to **Off**, the curve is applied at 100%. The side-chain controller cannot be used.
- In **Switched** mode, the velocity curve is only applied if the side-chain controller sends a value higher than 64. This allows you to use a foot switch to activate or deactivate the influence of the velocity curve, for example.
- In **Continuous** mode, the incoming side-chain controller value is used to scale the influence of the velocity curve. If this is 0, the curve has no effect. If this is set to 127, the curve is applied at 100%.
- In **Replace** mode, you can use the side-chain controller as a source for the input velocity. In this case, the originally played velocity is ignored.

### Side-Chain Controller

Specifies which MIDI Controller is used to control the effect of the velocity curve.

## Tuning Scale

This MIDI module allows you to create custom tuning scales or apply one of the tuning scale presets.



### Presets

The most commonly used scale in western music is the equal tempered scale, where adjacent notes are positioned at an equal distance of 100 cents from each other. Another well-known traditional tuning scale is the well-tempered scale or the Kirnberger scale, for example.

You can find examples in the presets that come with HALion.

### Scala Files

You can import tuning scales in the popular Scala file format via the scale preset pop-up menu.

This way, you can make use of the thousands of tuning scale presets that are available on the Internet.

### Absolute Mode

MIDI notes can contain micro-tuning information, that is, tune offsets per note.

If **Absolute Mode** is activated, this information is ignored, and only the settings of the tuning scale are applied.

If **Absolute Mode** is deactivated, the tuning scale settings are applied on top of the incoming micro-tuning information.

### Amount

Specifies how to apply the tuning scale. With a setting of 100%, the tune offsets are applied as specified in the tuning scale. At 0%, the tuning scale is not applied.

### Notes Mode/Octaves Mode

Determines whether your tuning changes are equally applied to all octaves on the keyboard or only to specific notes.

#### RELATED LINKS

[Handling Section and Module Presets](#) on page 25

## Editing Tuning Scales

You can create custom tuning scales by editing the notes per octave or by editing the 128 MIDI notes individually. Editing the scale per octave is particularly useful for creating different temperaments. Editing the scale per note is useful for creating stretched tunings.

---

#### PROCEDURE

1. To the right of the scale editor, specify whether you want to edit the scale per notes or per octaves.
    - Select **Octaves** to equally apply the tune offsets to all octaves on the keyboard.
    - Select **Notes** to apply the tune offsets only to specific notes.
  2. In the scale editor, click the **Offset** field of the note that you want to adjust, and set the tune offset.
- 

## Lua Script

The Lua Script module allows you to create and manage your own scripts.

In the following sections, the basic concepts and procedures are described. For more detailed information on all parameters, editing possibilities, advanced features, etc., go to <https://developer.steinberg.help>.

## Internal Editor vs. External Editor

The Lua Script MIDI module comes with an internal, plain text editor. This editor can be used to write, load, and edit scripts. However, it does not offer code highlighting or advanced editing features.

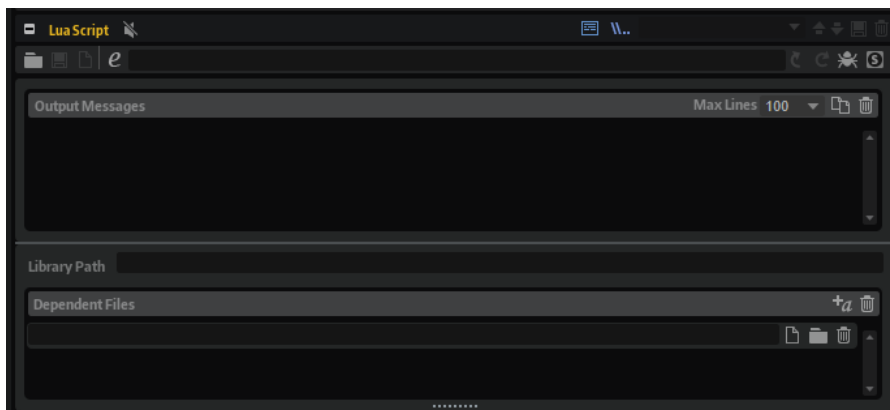
If you want to write complex scripts, you can use an external editor. However, scripts that are written in an external editor are not part of the script module. Only the file path for the script is saved in the VST Preset.

Scripts that are written in the internal editor have the following advantages and disadvantages:

- You can easily use them on another computer, because they are part of the Lua Script module.
- If an internal script is modified, this modification is not automatically applied to all presets in which the script is used. It has to be added manually to each preset.

Scripts that are written in an external editor have the following advantages and disadvantages:

- They can be easily modified throughout all presets that use them.
- If you want to use them on another computer, you must either make sure that the corresponding script file is available on this computer, together with the script module, or you have to manually copy the source code into the internal script editor.



## Toolbar

### Load Script

Allows you to load a script from disk.

The loaded file is referenced by the script module.

### Save Script

Saves a script that was created with the internal editor to disk.

After saving the script to disk, it is referenced by the Lua Script module.

### New Script

Clears the current script module. This command removes any internal or referenced script.

### Edit Script

Opens the script editor.

- If an external editor is specified in the **Options Editor**, this editor is used.
- If no external editor is specified, the internal editor is used.

### Script Source File

Shows the file path to the script source file on your disk.

### Reload from File/Script

Allows you to reload the script.

#### NOTE

- This function does not clear any output messages or remove any parameters that are defined for the script module.
- 

### Reset from File/Script

Resets the current script.

#### NOTE

- This function removes any existing output messages, as well as parameters that are defined for the script module.
- 

### Connect to Debugger

Connects the script module to an external debugger.

### Syntax/Runtime Error

Lights up if a syntax or runtime error occurs when processing the script. In this case, you must fix the error and reset the script.

## Output Messages

In this section, any syntax and execution errors or the output of the print function are displayed.

- To show/hide this section, click **Show/Hide Output Messages** in the top right corner of the editor.

### Max Lines

Sets the maximum number of visible lines.

### Copy Messages to Clipboard

Copies the output messages to the clipboard. This allows you to copy larger output messages to an external editor that offers a text search, for example.

#### NOTE

This also includes any older messages that are not visible anymore.

---

### Clear Message Display

Clears the output messages.

## Library Path

Lua's **require** function allows you to load and run your own libraries. In the **Library Path** field, you can specify where **require** searches for libraries.

#### NOTE

The path that you specify here only applies to this script module. The global library path for script modules is specified in the **Options Editor**.

---

## Dependent Files

This section lists all files that are required by the script module. This list is used to add the script files to a VST Sound container, for example.

- To show/hide this section, click **Show Dependent Files** in the top right corner of the editor.

### Add Required Files Automatically

Allows you to automatically add the files that you included via the **require** function to the list of dependent files.

### Clear Dependent Files

Removes all entries from the list of dependent files.

### Select File

Allows you to change the current entry or to add a new file.

### Select Folder

Allows you to add all files in the specified folder to the list of dependent files.

### Delete Entry

Removes the selected entry from the list of dependent files.

## Creating a Script With the Internal Editor

### PREREQUISITE

You added a Lua Script midi module.

---

### PROCEDURE

1. In the editor for the Lua Script midi module, click **Edit Script**.
  2. In the text editor, enter your script, and click **OK**.
- 

## Setting Up an External Editor

HALion includes a basic text editor for scripts. If you want to use advanced features and code highlighting, you can set up and use an external editor.

---

### PROCEDURE

- In the **Options Editor**, in the **Scripting** section, click **Browse for External Editor**, and select the application that you want to use.
- 

### RESULT

If you now open a script by clicking **Edit Script** in the editor for the Lua Script module, it is opened in the external editor.

### NOTE

A Lua script must be saved to disk before it can be opened in an external editor.

---



# Key Commands Reference

Below, the default key commands are listed according to category.

## Edit Category

---

Option	Key Command
AutoVisibility	<b>V</b>
Copy	<b>Ctrl/Cmd - C</b>
Create Group from Selection	<b>Ctrl/Cmd - G</b>
Cut	<b>Ctrl/Cmd - X</b>
Delete	<b>Delete</b> or <b>Backspace</b>
Edit	<b>Ctrl/Cmd - E</b>
Hide Non-Selected	<b>Ctrl/Cmd - Shift - H</b>
Hide Selected	<b>Ctrl/Cmd - H</b>
Move Down	<b>Shift - Down Arrow</b>
Move Hi Key Left	<b>Alt/Opt - Left Arrow</b>
Move Hi Key Right	<b>Alt/Opt - Right Arrow</b>
Move Hi Velocity Down	<b>Alt/Opt - Down Arrow</b>
Move Hi Velocity Up	<b>Alt/Opt - Up Arrow</b>
Move Left	<b>Shift - Left Arrow</b>
Move Low Key Left	<b>Ctrl/Cmd - Left Arrow</b>
Move Low Key Right	<b>Ctrl/Cmd - Right Arrow</b>
Move Low Velocity Down	<b>Ctrl/Cmd - Down Arrow</b>
Move Low Velocity Up	<b>Ctrl/Cmd - Up Arrow</b>
Move Right	<b>Shift - Right Arrow</b>

---

<b>Option</b>	<b>Key Command</b>
Move Up	<b>Shift - Up Arrow</b>
Mute	<b>M</b>
Paste	<b>Ctrl/Cmd - V</b>
Redo	<b>Ctrl/Cmd - Shift - Z</b>
Rename	<b>F2</b>
Replace Samples	<b>Ctrl/Cmd - R</b>
Select All	<b>Ctrl/Cmd - A</b>
Select None	<b>Ctrl/Cmd - Shift - A</b>
Select Tree	<b>Ctrl/Cmd - T</b>
Show All	<b>Ctrl/Cmd - Shift - U</b>
Show Selected	<b>Ctrl/Cmd - U</b>
Solo	<b>S</b>
Undo	<b>Ctrl/Cmd - Z</b>

---

## Global Category

---

<b>Option</b>	<b>Key Command</b>
Down	<b>X</b>
Enable Mapping Selection Options	<b>Ctrl/Cmd - M</b>
Import Samples	<b>Ctrl/Cmd - I</b>
Left	<b>A</b>
Right	<b>D</b>
Up	<b>W</b>

---

## Media Category

---

Option	Key Command
Open	<b>Return</b> or <b>L</b>

---

## Navigate Category

---

Option	Key Command
Bottom	<b>End</b> (Windows only)
Down	<b>Down Arrow</b>
Left	<b>Left Arrow</b>
Less	<b>Ctrl/Cmd - Num -</b>
More	<b>Ctrl/Cmd - Num +</b>
Right	<b>Right Arrow</b>
Toggle Selection	<b>Ctrl/Cmd - Space</b>
Top	<b>Home</b> (Windows only)
Up	<b>Up Arrow</b>

---

## Zoom Category

---

Option	Key Command
Zoom In	<b>H</b>
Zoom Out	<b>G</b>

---


# Using the Standalone Version of the Plug-in

You can use HALion independently of a host application.

If you use HALion as a standalone application, an additional section is available at the top of the control panel. In this section, you can define key commands, set up audio and MIDI interface routings, adjust the master volume, and access the integrated MIDI scratch pad, which allows you to record your musical ideas without having to start a MIDI sequencer application. It can also be used to play multitrack arrangements that trigger the different programs.

## Preferences Settings

You can configure the standalone version of HALion via the **Plug-in Preferences** dialog.

- To open the **Plug-in Preferences** dialog, click the **Open Preferences** button  to the right of the audio output field, or right-click in the topmost section of the control panel, and select **Plug-in Preferences** from the context menu.

## Preferences Dialog

The **Plug-in Preferences** dialog has several pages on which you can make settings.

### MIDI Page

On the **MIDI** page, you can access the 64 input ports in groups of 16. For each of these groups, you can make separate routing settings.

#### MIDI Input Ports

Use this pop-up menu to specify a MIDI input.

#### Channel Filter

Determines whether MIDI events are recorded on all MIDI channels, or only on one specific channel.

#### Filter 'All Notes Off' Controller

Activate this parameter to avoid unwanted "All Notes Off" messages. Such messages are sent by some keyboards when the last key is released. This causes HALion to stop playback, even when the sustain pedal is still in use.

### Inputs Page

On the **Inputs** page, you can specify which inputs of the audio interface are connected to HALion's stereo input.

This is the input that can be selected from the **Sample Recorder**.

## Outputs Page

You can use the **Audio Output Ports** pop-up menus to assign different audio outputs. HALion supports 64 channels: two Master channels (left and right), 31 additional left and right stereo channels, and one 5.1 surround channel. You can assign different audio outputs for each channel.

- To map an output to a channel, select it from the pop-up menu.
- To set the front and rear channels to incrementing audio output ports, hold down **Shift**, and select an audio output.
- To assign the audio outputs to the front and rear channels in pairs, hold down **Alt/Opt-Shift**, and select an audio output.

## Metronome Page

On the **Metronome** page, a number of settings can be made regarding the use of a metronome.

### Mode

Activates/Deactivates the metronome or sets it to **Count In** mode.

### Accent

Accentuates the first beat of each bar.

### Level

Adjusts the volume of the metronome.

### Connections

Allows you to select a separate stereo output for the metronome.

## General Page

### Don't prompt for confirmation when quitting HALion

If you want the plug-in to close without prompting when you quit the program, activate **Don't prompt for confirmation when quitting HALion**.

### High DPI Mode

- If **High DPI Mode** is activated, the plug-in uses high-resolution bitmaps when it is displayed with a scaling of 150% or higher on a high-resolution monitor, such as 4K (UHD), 5K, etc. This allows for sharper images on high-resolution displays.

#### NOTE

Windows systems currently only support scaling factors that are multiples of 100. For example, if you use a scaling factor of 150%, in HALion, the scaling factor is set to 200%.

**High DPI Mode** may not be compatible with some combinations of software and hardware. If you experience display issues with your setup, you can deactivate **High DPI Mode**.

- If **High DPI Mode** is deactivated, the native monitor resolution is used.

## ASIO Driver Page

From the **ASIO Driver** pop-up menu, you can select your audio hardware driver.

### Release Driver when Application is in Background

Activate this option if you plan to use several audio applications simultaneously.

### Input Latency/Output Latency

The input and output latency values for your audio hardware are displayed. Latency is the amount of time it takes for your system to respond to any messages that are sent to it. High latency results in a noticeable delay between pressing a key and hearing the sound.

You can change the latency via the **Buffer Size** parameter in the control panel for your driver, which you open by clicking the **Control Panel** button on the **Advanced** tab.

### Sample Rate

Below the latency values, the sample rate for the connected audio hardware is displayed.

### Audio Priority

Determines which of the HALion processes gains priority when accessing processor resources on your computer.

- In **Normal** mode, non-audio processes and audio playback get roughly equal priorities.
- In **Boost** mode, audio precedes MIDI in priority. Try this mode if audio playback problems occur when playing back MIDI and audio material.

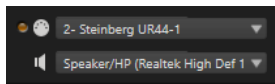
### Activate Steinberg Audio Power Scheme

If this option is activated, all power safe modes that have an impact on real time processing are deactivated. Note that this is only effective for very low latencies, and that it increases the power consumption.

## Advanced Page

Once you have selected the driver, you can specify which inputs and outputs to use and name these on the **Advanced** page. Click the **Control Panel** button to open the control panel for the audio hardware, and adjust the settings as recommended by the audio hardware manufacturer.

## Selecting the MIDI Input and the Audio Output



The MIDI input pop-up menu lists all MIDI devices that are installed on your system.

- Select the MIDI device that you want to use from the **Main MIDI Input Port** pop-up menu. The MIDI activity LED in the top left corner of the control panel indicates incoming MIDI messages via the selected MIDI input. The LED lights up on receiving note-on and controller messages. This way, you can check if HALion and your MIDI keyboard are connected to the same MIDI device input.

The Audio output pop-up menu lists all outputs of the selected ASIO device.

- To select an audio output for the main stereo channel of the plug-in, open the **Audio Output Ports** pop-up menu.

### RELATED LINKS

[ASIO Driver Page](#) on page 679

## Scratch Pad

The scratch pad allows you to record and play back MIDI files in Standard MIDI File format (SMF). You can load existing MIDI files, and you can record your own files and save them.



### Info icon

Hover over the info icon in the top left corner of the scratch pad to display the name of the loaded MIDI file.

### Song position indicator

The song position indicator shows the position of the transport cursor. Above the song position indicator, the position is displayed as a number.

- To move the transport cursor, drag the song position indicator to a new position.
- To switch the time format between **Time** and **Bars**, click **Select Time Format** in the top right corner of the display.

### Transport controls

- Click **Play** to start playback of the MIDI file.
- Click **Stop** to pause the MIDI file at the current position. Click the button twice to reset the song position to the start.
- Click **Record** to start recording.
- Activate **Loop** to play the entire MIDI file in a loop.

### Tempo

- Set this parameter to **Track** to follow the original tempo of the MIDI file. With the **Adjust Tempo** parameter, you can scale the playback relatively to the original tempo of the MIDI file.
- Set this parameter to **Fixed** to enter the tempo manually. You can either enter the value directly in the value field, or you can enter a tempo by repeatedly clicking the **Tap to set Tempo** field next to the value field.

The scratch pad and the metronome use the **Tempo** setting.

### Time Signature

Determines the time signature. You can enter a new time signature in fractions of beats.

### Load MIDI File

Allows you to load a MIDI file. The scratch pad can play back multi-track MIDI files sending notes on all 16 MIDI channels. It also sends MIDI program change messages when a MIDI file is loaded.

### Save Recording as MIDI File

Allows you to save the MIDI file.

### Record Mode

Determines when to start recording after you click **Record**.

- To start recording immediately, select **Direct**.
- To start recording with the first MIDI note, select **MIDI**.
- To start the recording after a count-in of one bar, select **Count In 1**.

- To start the recording after a count-in of two bars, select **Count In 2**.

### **Metronome**

Allows you to activate a metronome that you can use for recording and practicing.

### **Metronome Volume**

Sets the level for the metronome click.

#### RELATED LINKS

[Using the Metronome](#) on page 682

## Recording Your Performance

---

### PROCEDURE

1. Click the record symbol below the **Record** button to select a record mode.
  2. Click the **Record** button to start recording.  
To indicate that the recording is running, the song position indicator moves from left to right.
  3. When you are done recording, click the **Stop** button.
- 

#### RELATED LINKS

[Scratch Pad](#) on page 681

[Saving a MIDI File](#) on page 683

## Using the Metronome

---

### PROCEDURE

- To select the playback mode of the metronome, click **Metronome**, and select one of the options from the pop-up menu:
    - If **On** is selected, the metronome is activated and plays continuously.
    - If **Count In** is selected, the metronome plays only during the count-in of a recording.
    - To deactivate the metronome, select **Off**.
- 

## Loading a MIDI File

You can load MIDI files in Standard MIDI File format (file name extension `.mid`).

---

### PROCEDURE

1. Click the **Load MIDI File** button below the transport buttons.
  2. In the file dialog, select the file that you want to use.
  3. Click **Open** to load the MIDI file.
-



## MIDI Channel Filter

If a multi-track MIDI file is loaded, you can play back all MIDI events or only the events of a specific MIDI channel.

- To specify events for playback, click the **MIDI Channel Filter** field to the right of the info icon, and select an option from the pop-up menu.

## Saving a MIDI File

---

### PROCEDURE

1. Click the **Save Recording as MIDI File** button below the transport buttons.
  2. In the file dialog, specify a location and a file name.
  3. Click **Save** to save your recorded performance as a MIDI file.
- 

## Master Volume



Use the volume control on the right to set the master volume of the outputs of the standalone version of HALion.

# Index

## A

ABS button [117](#)  
Absolute Editing [117](#)  
Audio Busses [281](#)  
Audio Output [680](#)

## B

Browser  
    Loading Files [82](#)

## C

Control Panel [14](#)  
    Setup Options [14](#)

## D

Decomposing samples [237](#)  
Delay Effects [564](#)  
Distortion Effects [577](#)  
Dynamics Effects [597](#)

## E

Editors  
    Available [16](#)  
Effect Slots [287](#)  
Effects [279](#), [560](#)  
    Amplifier [577](#)  
    Auto Filter [570](#)  
    Bass Tape Ducking Delay [564](#)  
    Brickwall Limiter [602](#)  
    Channel Router [609](#)  
    Chorus [587](#)  
    Compressor [598](#)  
    Distortion [580](#)  
    DJ-EQ [568](#)  
    Downmix [608](#)  
    Envelope Shaper [606](#)  
    Equalizer [568](#)  
    Expander [603](#)  
    Flanger [588](#)  
    Frequency Shifter [592](#)  
    Gate [604](#)  
    Graphic EQ [567](#)  
    Limiter [601](#)  
    Maximizer [603](#)  
    MorphFilter [574](#)  
    Multi Delay [565](#)  
    Octaver [586](#)  
    Phaser [590](#)  
    Resonator [574](#)

## Effects (continued)

    Reverb [562](#)  
    REVerence [560](#)  
    Ring Modulator [591](#)  
    Rotary [594](#)  
    Step Flanger [588](#)  
    Stereo Pan [606](#)  
    StereoEnhancer [607](#)  
    Studio EQ [566](#)  
    Surround Panner [607](#)  
    Tape Saturator [582](#)  
    Tremolo [590](#)  
    Tube Compressor [600](#)  
    Tube Saturator [582](#)  
    Using [287](#)  
    Vibrato [596](#)  
    Vintage Compressor [599](#)  
    Vintage Ensemble [596](#)  
    VST Amp [580](#)  
    VST Bass Amp [583](#)  
    WahWah [577](#)  
Effects Page [287](#)  
Envelopes  
    Selecting nodes [192](#)  
    Setting up the Loop [196](#)  
    Synchronizing to host [195](#)  
EQ Effects [566](#)

## F

Filter Effects [570](#)  
FM synthesis [154](#)

## H

HALion 3 Effects [610](#)

## I

Insert Effects [286](#)

## K

Key Commands [675](#)

## L

Layers [54](#)  
    Loading [55](#)  
Legacy Effects [610](#)

**M**

- Macro Page [497](#)
  - Adding a background image [499](#)
  - Connecting the program parameters [499](#)
  - Controls [497](#)
  - Creating a template [522](#)
  - Libraries [497](#)
  - Loading a template [499](#)
  - Preparations [498](#)
  - Resources [497](#)
  - Saving [501](#)
  - Templates [497](#)
- Macro Page Designer [502](#)
  - Canvas [519](#)
- Macro Pages
  - Collaborating with Others [539](#)
  - Creating [497](#)
  - Exchanging Pages and Content [539](#)
- Mapping Editor [93](#)
- Master Section [28](#)
- MediaBay [69](#)
  - Results List [76](#)
- MIDI Controllers [275](#)
  - Assigning [275](#)
  - Factory Controller Assignment [277](#)
  - Parameter range [275](#)
  - Unassigning [275](#)
- MIDI Editor [273](#)
- MIDI Input [680](#)
- MIDI Modules [621](#)
  - Assigning in the Modulation Matrix [623](#)
  - Bypassing [621](#)
  - CC Mapper [668](#)
  - Changing the Order [623](#)
  - Drum Player [642](#)
  - Editor [622](#)
  - FlexPhraser [624](#)
  - Inserting [621](#)
  - Key Switch Alternate [664](#)
  - Key Switch Remote [666](#)
  - Layer Alternate [662](#)
  - MegaTrig [654](#)
  - MIDI Player [637](#)
  - MIDI Randomizer [667](#)
  - Mono Envelope [647](#)
  - Mono LFO [649](#)
  - Mono Step Modulator [651](#)
  - Trigger Pads [634](#)
  - True Pedaling [653](#)
  - Tuning Scale [670](#)
  - Velocity Curve [669](#)
- Missing Samples
  - Finding [55](#)
- Mixing [279](#)
- Modulation Effects [586](#)
- Modulation Matrix [205](#)
- Mono Step Modulator [651](#)
- Multi Selection [22](#)
- Multis [54](#)

**N**

- Note Expression [113](#)

**O**

- Options Editor [41](#)
- Organ Zones
  - Voice Control Section [123](#)

**P**

- Panner Effects [606](#)
- Pitch Detection
  - Wavetable Editor [269](#)
- Pitch Shift Effects [585](#)
- Preferences Dialog [678](#)
- Presets [54](#)
  - Module Presets [24](#)
  - VST Presets [24](#)
- Program Slot Section [27](#)
- Program Table [288](#)
  - Parameters [288](#)
- Program Tree [292](#)
  - Elements [292](#)
- Programs [54](#)
  - Loading [55](#)

**Q**

- Quick Controls [33](#)
  - Bypassing [40](#)
  - Managing [38](#)

**R**

- Recording
  - Samples [334](#)
- REL button [117](#)
- Relative Editing [117](#)
- Reverb Effects [560](#)

**S**

- Sample Editor [221](#)
  - Creating Loops [244](#)
  - Creating Slices [246](#)
  - Zoom [243](#)
- Sample Recorder [334](#)
- Samples
  - Decomposing [237](#)
  - Exporting [311](#)
  - Finding [55](#)
  - Importing [305](#)
  - Recording [334](#)
  - Replacing [247, 310](#)
- Slices
  - Creating [246](#)
- Sound Editor [103](#)
  - Main Section [104](#)
  - Note Expression Section [112](#)
  - Quick Control Assignments Section [36](#)

Sound Editor (*continued*)  
  Trigger Section [105](#)  
  Variation Groups Section [111](#)  
  Voice Management Section [107](#)  
Spatial Effects [606](#)  
Standalone Plug-In Version [678](#)  
  Loading MIDI Files [682](#)  
  Preferences [678](#)  
  Saving MIDI Files [683](#)  
Surround Effects [607](#)

## T

Tools Effects [609](#)

## V

Value Ranges  
  Adjusting [22](#)  
VST Bass Amp [583](#)

## W

Wavetable  
  Creating [269](#)  
Wavetable Editor [248](#), [249](#)  
  2D Wave [255](#)  
  3D Map [255](#)  
  Analyzer [255](#)  
  Replacing Samples [271](#)  
  Spectrum Analyzer [255](#)  
Wavetable Synthesis [248](#)  
Wavetable Zones  
  Editing in the Wavetable Editor [248](#)

## Z

Zone Editor [115](#)  
  Amplifier Section [183](#)  
  Envelope Section [185](#)  
  Filter Section [180](#)  
  LFO Section [196](#)  
  Organ Oscillator Section [145](#)  
  Oscillator Section [125](#)  
  Pitch Section [124](#)  
  Sample Oscillator Section [128](#)  
  Voice Control Section [119](#)  
  Wavetable Section [146](#)  
Zones  
  Editing [115](#)  
  Fades and Crossfades [100](#)  
  Mapping [93](#)  
Zoom snapshots [101](#), [194](#)  
Zooming [194](#)