HALION6

VST Sampler & Sound Creation System

steinberg

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

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Introduction

Conventions

In our documentation, we use typographical and markup elements to structure information.

Typographical Elements

The following typographical elements mark the following purposes.

Prerequisite

Requires you to complete an action or to fulfill a condition before starting a procedure.

Procedure

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

Important

Informs you about issues that might affect the system, the connected hardware, or that might bring a risk of data loss.

Note

Informs you about issues that you should consider.

Tip

Adds further information or useful suggestions.

Example

Provides you with an example.

Result

Shows 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, etc.

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**.

Key Commands

Many of the default key commands, also known as keyboard shortcuts, use modifier keys, some of which are different depending on the operating system.

When key commands with modifier keys are described in this manual, they are indicated with the Windows modifier key 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 You Can Reach Us

Click the Steinberg logo in the top right corner of the control panel to open a pop-up menu containing items for getting additional information and 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 online and most of it can be downloaded in PDF format from steinberg.help.

- To visit 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 **Help** > **HALion Help**.

- You can find the documentation for the HALion scripting features, as well as additional parameter descriptions regarding the **Macro Page Designer** under http://developer.steinberg.help.

  Here, you can find tutorials and parameter references, download example files, and much more.

Setting Up

You can use HALion as a plug-in in different 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

HALion loads with a stereo output configuration by default. 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 lets HALion work in an AU environment without any performance loss or incompatibilities.

For example, to load HALion as an AU instrument for 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 AAX instrument in ProTools.

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

PROCEDURE

1. To use HALion as stereo multichannel plug-in, open the **Track** menu, and select **New** > **Stereo** > **Instrument Track**.
2. To use HALion' 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 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 548

HALion Control Panel

HALion provides flexible and highly customizable window management. 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 freely adjustable. This allows you to make the most of the available screen space.

Configuring the Control Panel

You can set up the control panel by determining the number of different views, that is, window sections, and by further configuring these sections, for example, by adding tabs. For the views and tabs, you can specify the editor that is displayed.

Setup Options

You can configure the control panel using the setup options.

For views, click the **Setup Options** icon in the header to open the menu that contains the setup options.
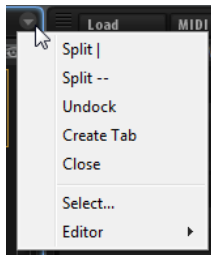
For tabs, right-click the name of the tab to open the context menu that contains the setup options.

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 these two, 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.

Window Handling

Creating Additional Windows

You can create new windows from existing views in the following ways:

- 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.

Using Window Presets

HALion comes with several preconfigured window presets.

- To open a window preset, click the **Open New Window** button in the top bar and select it from the pop-up menu.
- To create your own window presets, use the corresponding commands on the pop-up menu.

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.

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

Screen Sets

You can save the configuration of the control panel as a screen set. This way, you can preconfigure HALion for different workflows and editing situations. By default, the following screen sets are available:
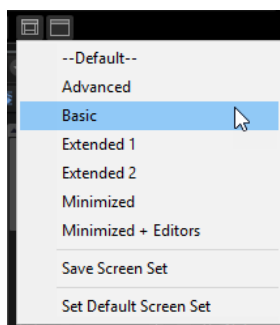
Default

This screen set is optimized for wide-screen monitors and contains the most important editors. It is suitable for a display resolution of 1440 x 900.

Advanced

This is the full editor screen set. It is suitable for a resolution of 1440 x 900.

Basic

> This is a minimized single slot player view. It is suitable for a display resolution of 1024 x 768.

Extended 1

> This screen set is optimized for use on laptops with a display resolution of 1280 x 800.

Extended 2

> This screen set is also optimized for laptops, but it is slightly larger than **Extended 1**. It is suitable for a display resolution of 1440 x 900.

Minimized

> This screen set shows the smallest configuration.

Minimized + Editors

> This screen set provides the minimized plug-in window plus an additional window that contains all editors. This configuration is intended for use in host applications where you cannot resize the main plug-in window.

● 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 the corresponding command from the pop-up menu.
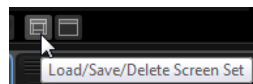
NOTE

Factory presets cannot be deleted.

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.

PROCEDURE

● 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.

Available Editors

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

Slot Rack

Allows you to load and manage the loaded programs.

MIDI Editor

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

Program Tree

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

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**.

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.

MIDI Modules Editor

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

Mapping Editor

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

Sample Editor

Allows you to define the sample and loop parameters.

Wavetable Editor

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

Sample Recorder

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

Browser

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

MediaBay

Allows you to load programs and layers.

Library Creator

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

Macro Page

VST Sound Instrument Sets provide macro pages. These pages are preconfigured to show the most important parameters for the specific programs. Whether it is possible to edit a program only via its macro page or whether you have access to all underlying zone and layer parameters depends on the instrument set.

If a program comes with a macro page, this page is displayed when you open the **Macro Editor**. If you load a program that contains one or multiple layers with macro pages, all macro pages are shown together in the **Macro Editor**. For each macro page, HALion inserts a navigation button on the toolbar that allows you to switch between the pages.

Macro Page Designer

Allows you to create your own macro pages.

Mixer

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

Keyboard

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

Quick Controls

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

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.

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.

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.

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.

MIDI Ctrl

Lists all assigned MIDI controllers.

Undo History

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

Options

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

RELATED LINKS

Common Editing Methods

Dials and Sliders

Dials 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 dials and sliders.

- To adjust a value, click a dial or a slider and drag up and down, or use the mouse wheel.

  If you press **Alt** when clicking a dial, a small slider appears, allowing you to set the parameter.

- To make fine adjustments, press **Shift** and move the dial 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 dials, 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** 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 **Enter**.

  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.
- 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**-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.

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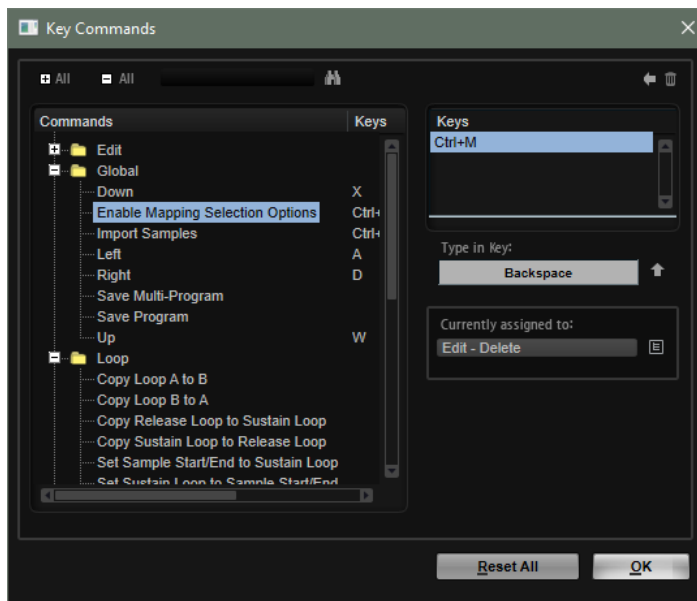
- To open the **Key Commands** dialog, open the **Options Editor** and click the **Key Commands** button in the **Edit** section.

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 any currently assigned key commands.

- To set up a key command, select the function in the list, enter the key command in the **Type in Key** field and click the **Assign** ◼ button to the right of the field. If this key command is already used for another function, this is displayed in the field below.

- To delete a key command, select the function in the list, select the key command in the **Keys** list and click the **Delete** ▥ button.

- To search for a specific function, enter its name in the search field at the top of the dialog and click the **Start/Continue Search** 🔍 button.

NOTE

You can set up several key commands for the same function.

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

The preset controls can be found throughout the program. The handling is always the same.

- 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 delete a preset, click **Delete** 🗑.

NOTE

Factory presets cannot be deleted.

Handling VST Presets

Loading VST Presets

PROCEDURE

1. In the header of the plug-in panel, click the **Preset Management** button next to the preset name field and select **Load Preset**.
2. Do one of the following:
   - Select a preset to load it.
   - Double-click a preset to load it and close the preset loader.

Saving VST Presets

PROCEDURE

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

Inserting VST Presets as Layers

PROCEDURE

1. Right-click the program or layer for which you want to insert the VST preset and select **Load/Save** > **Load to new Layer**.
2. Select a VST preset and click **OK**.

RESULT

The program is inserted as an additional layer.

- Alternatively, drag the VST preset from the **MediaBay** or the file browser into the **Program Tree**, and drop it on a layer.

Replacing Programs and Layers with VST Presets

PROCEDURE

1. Right-click the program or layer that you want to replace.

2. Open the **Load/Save** submenu and select **Replace Program** or **Replace Layer**.

3. Select a VST preset and click **OK**.

RESULT

The program or layer is replaced.

● Alternatively, drag the VST preset from the **MediaBay** or the file browser onto the **Program Tree**, and drop it on a program or layer.

Global Functions and Settings

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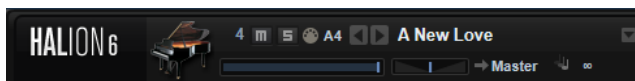
The slot parameters are the same as in the **Slot Rack**, with the following addition:

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 47

Master Section

The master section can be used to set volume and 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 get 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

Missing Busses

Opens the **Pending Busses** dialog, allowing you to resolve any bus connections that could not be established.

Find Missing Samples

Opens the **Find Missing Samples** dialog, allowing you to resolve 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.

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.

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

How many undo/redo operations are available depends on the **Number of Undo Steps** setting on the **Options** page.

RELATED LINKS
Unloading Unused Samples on page 23

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 and 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 above describes 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** 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.

The quick controls can be accessed via the **Quick Controls Editor** for a program or layer.

Value Tooltips

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.

Therefore, parameters that are assigned to a quick control show a value tooltip. This value tooltip indicates the resulting parameter value and the name of the assigned quick control.

Value tooltips can be activated or deactivated in the **Options Editor**.

RELATED LINKS

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 modulation source or modulation modifier in the modulation matrix. This allows you to combine the quick control with other modulation sources.

RELATED LINKS
Modulation Matrix Parameters on page 127

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 guarantee 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 guarantee 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. And you can assign a quick control to the same parameter of all zones inside a layer. This is called a multi assignment.

● Single assignments override multi assignments.

  For example, if a quick control remote-controls the cutoff of all zones inside a layer and you assign the cutoff 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 gets the same quick control assignments as the other zones of that layer.

Quick Control Assignments Editor
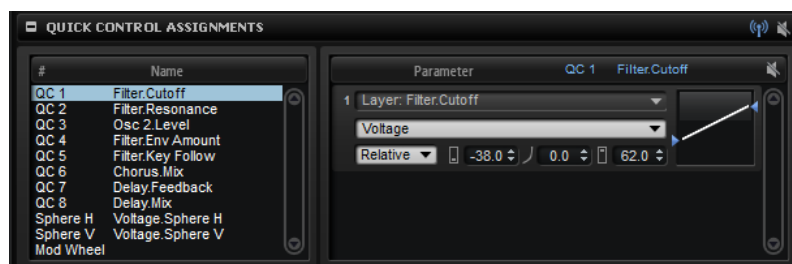
● The **Quick Control Assignments** editor can be found in the **Sound Editor** for programs or layers.

Receive Quick Controls

This button on the title bar of the **Quick Control Assignments** editor 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 are unaffected by the amp envelope.

Bypass All Quick Controls Assignments

This button on the title bar of the **Quick Control Assignments** editor 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 Controls List

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.

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.

Bypass Single Quick Control Assignment

Bypasses the corresponding quick control assignment.

For example, if a quick control is assigned to several layers, this option allows you to bypass the quick control assignment for one of the layers only.

Mode

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

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

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.
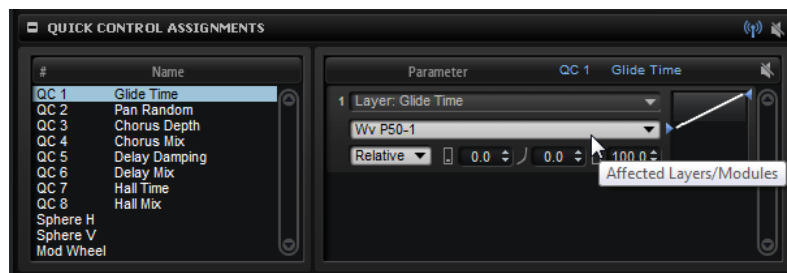
The pop-up menu in the middle of each assignment row displays which part of the program is affected by this quick control assignment. If the name of a zone or module is displayed here, only that zone or module is affected by the quick control assignment. If the name of the program or one of its layers is displayed, all zones inside the program or the layer are affected. You can change which part of the program is 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 all zones or only selected zones within a layer are affected by 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 **Quick Control Assignments** editor, activate the **Receive Quick Controls** 🎛 button.

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 assignment in the **Quick Control Assignments** editor separately.

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 towards exponential behavior.
  - Click and drag the curvature in the display on the right.

Setting the Mode for the Quick Control Assignment

A quick control behaves either as continuous control or as 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 in 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 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.

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 that has a single assignment that uses **Absolute** or **Relative** mode, HALion adjusts the setting of the quick control automatically so that the sound

does not change. Likewise, if you assign multiple parameters to the same quick control, HALion sets the range of this quick control assignment automatically.

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.
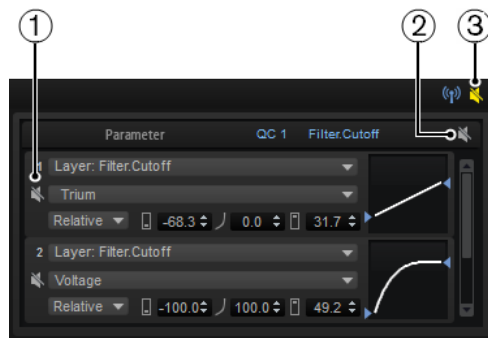
1   To bypass a single assignment for one quick control, click **Bypass Single Quick Control Assignment** in the **Quick Control Assignments** editor.

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 the quick controls directly to parameter controls, you can also assign them as 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, and MIDI controllers.
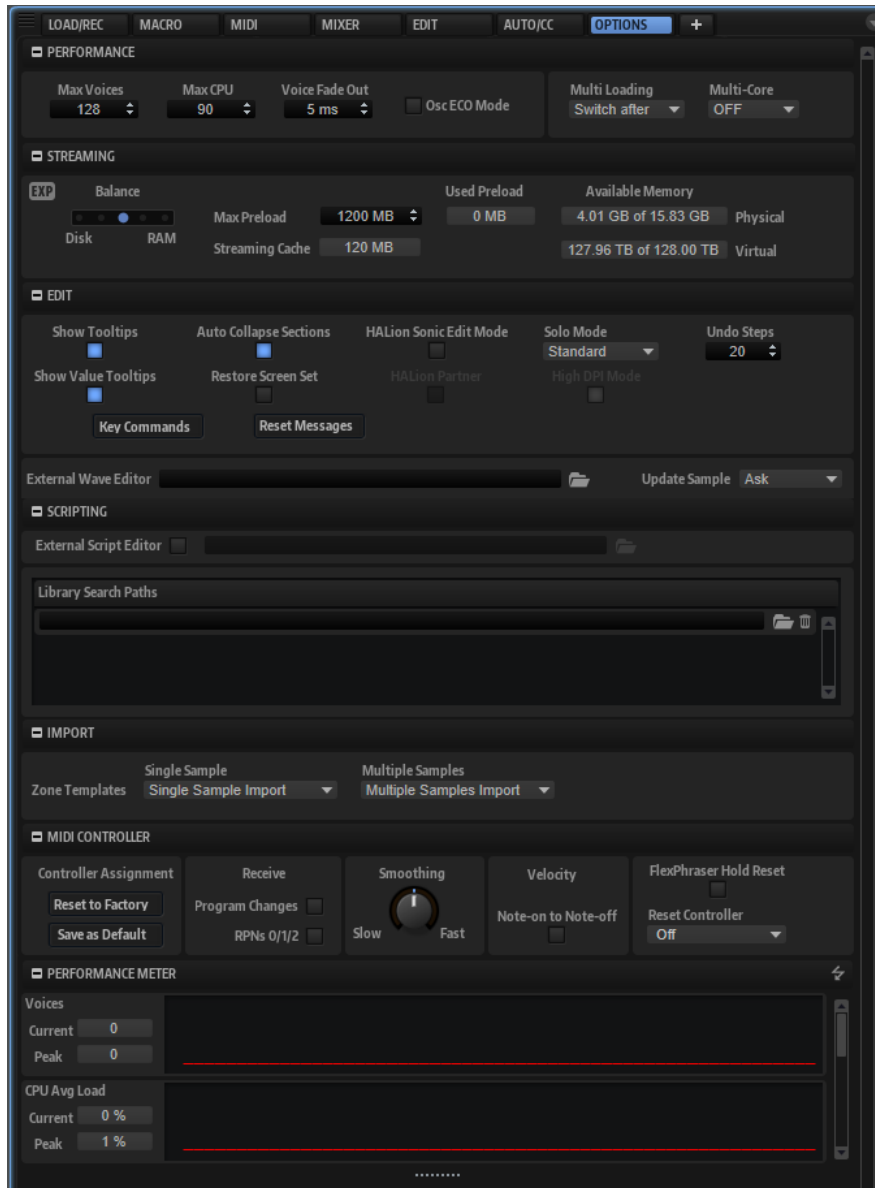
Performance Section

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 from CPU overloads, you can specify a maximum limit for the CPU load of the plug-in instance. HALion steals voices automatically when this limit is exceeded.

At a setting of 100 %, no voices are stolen and the available CPU is used to its limit. This can lead to audio drop-outs.

NOTE

Because of the reaction time of the plug-in, it is possible that you get 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 at a value a bit 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 have been reached.

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 is kept in the RAM until the new multi has been completely loaded.

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

Multi-Core

On 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 here depends on multiple factors, and varies from system to system, and project to project. A good starting point is to set this value to one core less than the available number of cores.

NOTE

If problems occur, 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 across the available cores.

Streaming Section

Some of the programs come with several gigabytes of samples. That is a large amount of data and 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 should be used and how much HALion should 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 always applies to all plug-in instances. It is not saved with the project. You set it up only once for your computer system.

Used Preload and Available Memory

These displays provide information of the memory load in MB according to the current 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

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 in a short 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 larger streaming cache in RAM. If you increase the **Prefetch Time**, it is recommended to also increase the **Streaming Cache**.

- **Streaming Cache** determines the amount of RAM that is reserved for prefetching. The actually needed size depends on the prefetch time, the number of simultaneously streaming voices and the audio format of the samples. For example, higher sample and bit rates need more RAM.

Edit Section

Here, you find common settings of HALion and you can specify an external wave editor that you want to use for editing your samples.

> NOTE
>
> The settings in this section are not saved with a project, but affect the plug-in as a whole.

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.

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.

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

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.

HALion Sonic Edit Mode

This mode allows you to edit a HALion Sonic or HALion Sonic SE 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/HALion Sonic SE cannot be deleted or replaced, in order to ensure the compatibility with those program versions. 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.

Number of Undo Steps

Specifies the number of available undo steps.

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 % and 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 used is 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.

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 reload the plug-in for the changes to take effect.

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.

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.

Here, you specify which application to use. You can enter the path manually or click the **Browse** button to navigate to the corresponding application folder.

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 old 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 always 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.

Scripting Section

In this section, you can set up and activate an external script editor and specify where HALion searches for script libraries.
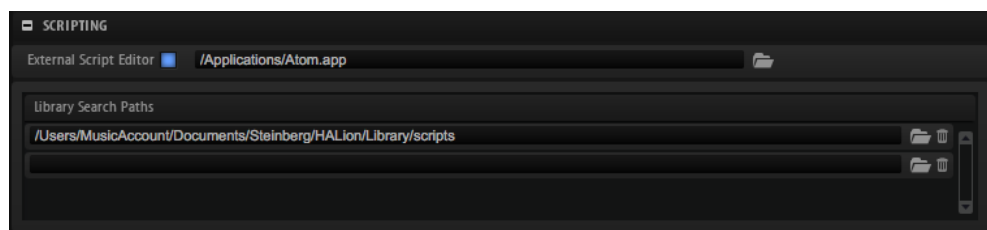
Use External Script Editor

Activates/Deactivates the use of the external editor.

Library Search Paths

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

RELATED LINKS
Setting Up an External Editor on page 542

Import Section

In this section, you can specify which zone templates to use when importing 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

Controller Assignment

With the two buttons in this section, you can save your customized MIDI controller assignments as default 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 Program Changes

If this option is activated, HALion responds to program change messages. These are used by General MIDI (GM) files, for example.

Receive RPNs 0/1/2

GM files can contain information about pitchbend range, coarse tuning, and fine tuning. This information is transmitted as RPNs (Registered Parameter Numbers). Activate this option if you want HALion to respond to RPNs.

MIDI Controller Smoothing

MIDI controllers have a maximum resolution of 128 steps. Therefore, 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 towards the **Slow** setting. 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 towards the **Fast** setting. 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 note-off velocity for the notes.

FlexPhraser

Hold Reset sends a global hold reset message to all FlexPhraser modules or arpeggiators that are used.

The **Reset Controller** pop-up menu allows you to assign a dedicated MIDI controller to the **Hold Reset** button for remote-controlling it.

Performance Meter Section

This 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 the **Reset** button in the title bar of the section. The following values are displayed:

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.

Dropout/s

The number of dropouts per second. This can be an indicator for hard disks that are 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 these parameters 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.
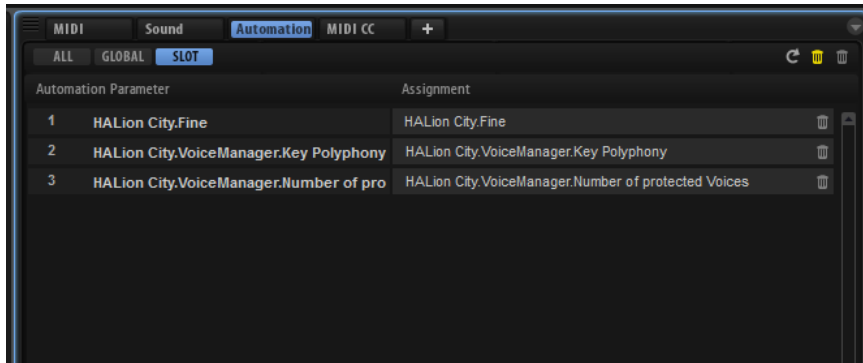
With the tabs at the top, you can specify whether you want to show the automation parameters for the slot, the global parameters, or all automation parameters.

On the left, the name of the automation parameter is shown, and on the right, the name of the assigned HALion parameter. 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 those 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.
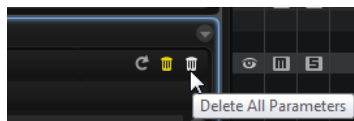
- To remove all disconnected automation parameters, click **Delete Disconnected Parameters** on the toolbar.
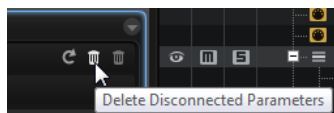
  Disconnected automation assignments could not be connected properly. This can occur if you make automation settings for a program and then load another program with a different structure into a slot, for example.

- 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 free 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, select these zones, or the layer that contains these zones, first.

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

The following sections describe how to load, save, and manage the different kinds of sound files in HALion.

Programs, Layers, Multis, Macro Pages, and Presets

Programs

A program is a complex instrument or sound that can consist of up to 4 layers. Often, a program contains a single layer that comes with all necessary components, such as the synthesis part or insert effects. 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.

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, add some effects to individual layers or to the whole program and you get a unique sound experience.

Layers

Programs are combinations of up to 4 layers. HALion offers 5 different layer types. You can choose between synth, sample, instrument, drum, and sliced loop layers. Each layer type is based on an individual sound architecture and has a dedicated editor.

Synth and Sample Layers

For synth and sample layers, you get access to a synthesizer editor with components such as a highly flexible filter section, powerful multi-stage envelopes, LFOs, a step modulator, and a modulation matrix. These layer types differ in their basic sound source. While a synth layer provides an oscillator section with three main oscillators, a sub oscillator, a noise generator, and a ring modulation stage, the sample layer loads a specific multi-sample instead.

Drum Layers

The drum layers load a multi-sampled drum set, for which you can individually adjust the most important parameters of each drum instrument. Each drum instrument can be set to a specific pan position or an individual output, or it can be filtered, reversed, and so on.

Loop Layers

Loop layers load a sliced loop, that is, a combination of a loop-specific MIDI phrase and the individual slices mapped across the keyboard. You can either play the original loop or a transposed version of it, or trigger single slices manually. Each slice can be modified with the same parameters as the drum instruments.

Instrument Layers

Instrument layers contain several multi-samples of an instrument that can be parts of single sounds or different articulations. These sublayers are called expressions.

You can modify expression parameters. By switching off an expression, you can shorten the load time of a sound.

Multis

HALion is a multitimbral plug-in that can load up to 64 sounds (or programs) and combine them. This combination is called a multi-program, or multi for short. You can use multis 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 and Macro Pages

VST Sound Instrument Sets from Steinberg provide additional content for VST instruments based on the HALion technology. They come with their own edit pages, called macro pages, that feature a customized look and a collection of controls that match the functions of the VST Sound Instrument Set. When you edit a program or layer of a certain VST Sound Instrument Set, the accompanying macro page opens. For details on the functions and controls of a particular macro page, refer to the documentation that comes with the corresponding VST Sound Instrument Set.

Furthermore, you can create your own macro pages with HALion's **Macro Page Designer**.

Presets

You can save and load all types of sounds as presets, that is, you can create presets for single programs, for layers, and for multis.

Content Files and Folder Structure

HALion comes with a large amount of ready-to-use sound content, made up of hundreds of multis, 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

Registering VST Sounds

To be able to use the content from VST Sound containers, these 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, please consult the **Library Manager** documentation on steinberg.help.

Loading Programs and Layers

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 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 in the **Slot Rack**.

● Via the slot context menu.

● Samples and third-party programs can be loaded into the **Slot Rack** from a file browser or the **Results List** using drag and drop.

NOTE

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

Inserting Programs in between Slots

To add a program or layer in 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. If this happens, the **Find Missing Sample** dialog opens
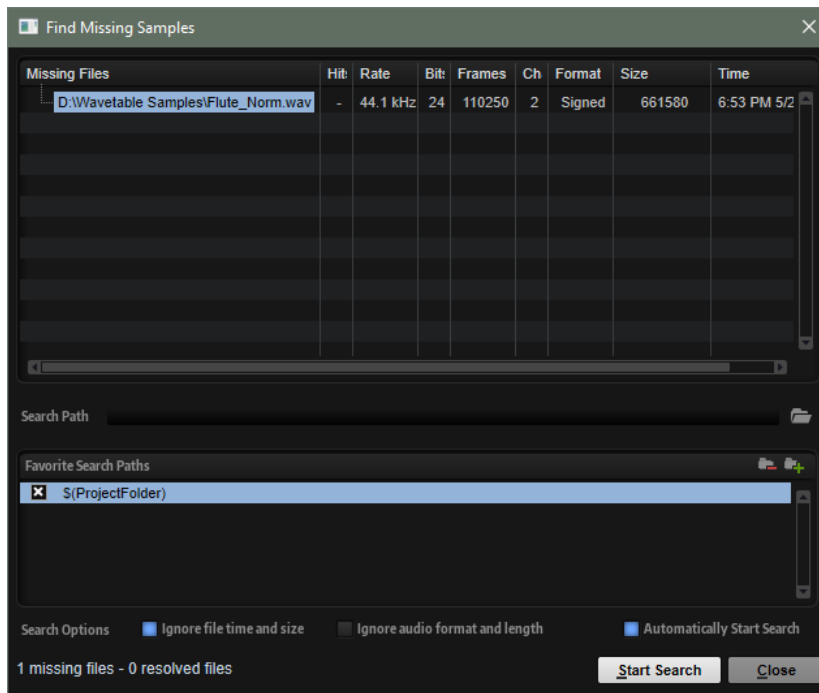
The dialog displays a list of all samples that are missing, with information regarding the format, size, and creation date.

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 start the search process.

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 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 correspond 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. By default, this option is activated. However, if you want to specify the search path or modify other options before starting a search, deactivate this option.

Load Dialog
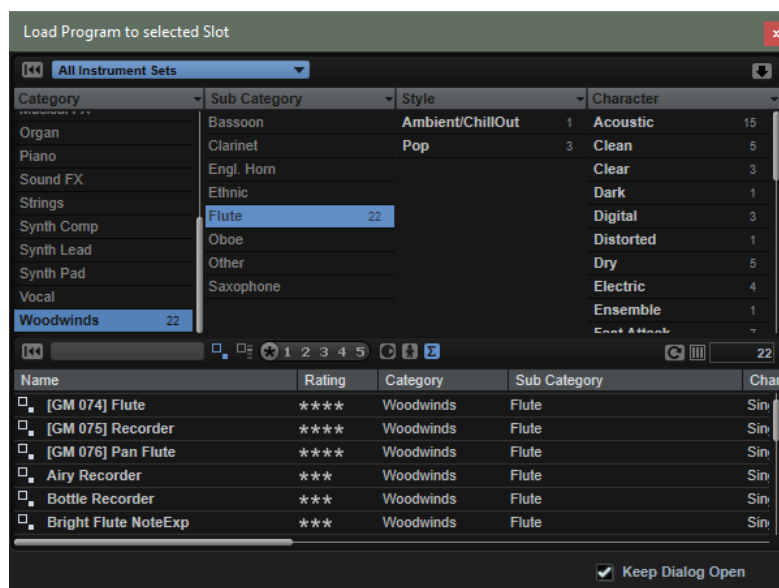
The **Load** dialog contains many of the **MediaBay** functions, allowing for very sophisticated search criteria.

RELATED LINKS
Filtering the Results on page 52
File Management in the MediaBay on page 51
Results List on page 53

Slot Rack

The **Slot Rack** has 64 slots. Each slot can hold a program, that is, you can work with 64 programs at the same time.
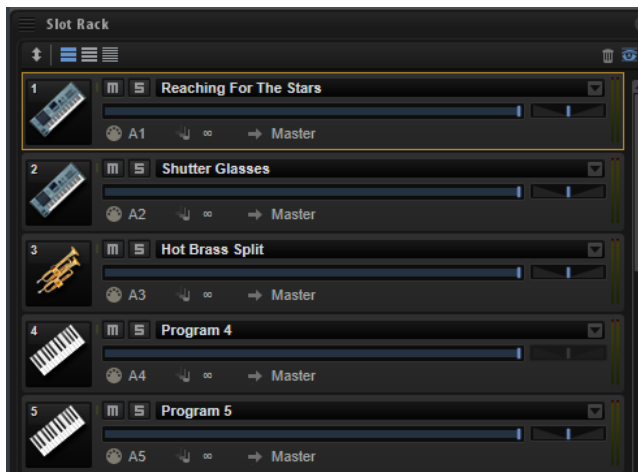
Once a program is loaded in the **Slot Rack**, it can be played and edited.

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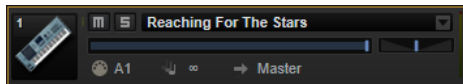
For the slots in the **Slot Rack**, the following controls are available:

Program Icon

> The program icon on the left shows to which sound category a program belongs if a category is set.

Mute

> Deactivates playback of the program.

Solo

> Activate the **Solo** button of a slot to hear only the corresponding program. Several slots can be soloed at the same time.

Level

> The level fader controls the output level of a program. 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

> This green bar next to the slot number and symbol indicates incoming MIDI data.

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 to which output bus the slot sends 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 or layer to load it into this slot.

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 under a new name.

Save Program As

Allows you to save the program under a new name.

Save All Programs

Allows you to save all programs as a VST preset.

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 keeping their respective formats.

Remove Program

Removes the program from the slot.

Init Program

Loads the **Init** program. This contains a neutral synth layer.

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.

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

Managing and Loading Files

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

Managing Multis

Multis can load multiple sounds or programs and combine them.

You can use multis 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, these multis 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

You can load multis in the following ways:

- 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 containing folder.

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. However, programs that use samples from VST Sound containers cannot be exported.

PROCEDURE

1. Click the **Export Multi-Program as VST 3 Preset with Files** button next to the multi slot.
2. Set up the attributes for the multi in the **New Preset Tags** section on the right, enter the name of the multi, and click **OK**.

RESULT

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

File Management in the MediaBay

The **MediaBay** gives access to presets, such as multis, programs, and layers.

In the top section of the page, you specify which sounds to look for. The lower section presents the corresponding results.
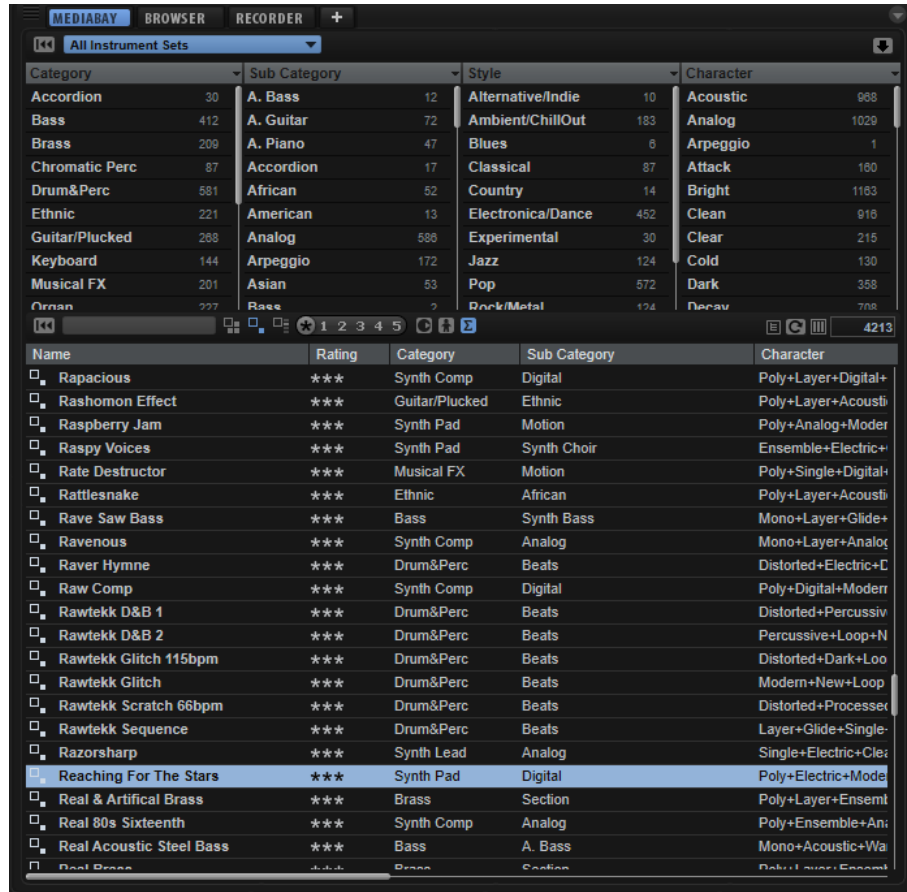
- To adjust the size of the two sections, drag the divider at the top of the results list.

Browsing for Files

The **MediaBay** allows you to browse for and load files. You can restrict the amount of files that are searched by filtering the results list or entering a search text.

PROCEDURE

1. On the **Select Content Set** menu, select the content set from which you want to load a program or layer. To browse the entire content, select **All**.

2. On the toolbar of the results list, specify whether you want to browse through the available programs ▣ or layers ▣.

3. Optional: In the upper section of the page, click on an attribute to display only those files containing the attribute, for example, percussion, or a specific musical style, etc.

   You can activate several attribute filters simultaneously.

4. If you are looking for a specific file, enter its name in the text search field on the toolbar.

   You can also enter text that is part of the file name or the file attributes in the search field.

5. In the results list, double-click a file to load it in the selected slot.

6. Play a note on your keyboard or use the internal keyboard to listen to the selected file.

If the file is not what you were looking for, step through the files in the results list and listen to them until you found the file that you want to use.

Filtering the Results

You can filter the results list using the configurable attribute columns at the top or by restricting the search to a specific content set.

Content Set Filter

Use the **Select Content Set** pop-up menu to restrict the search to a specific content set. By default, the search is performed in all installed content sets.
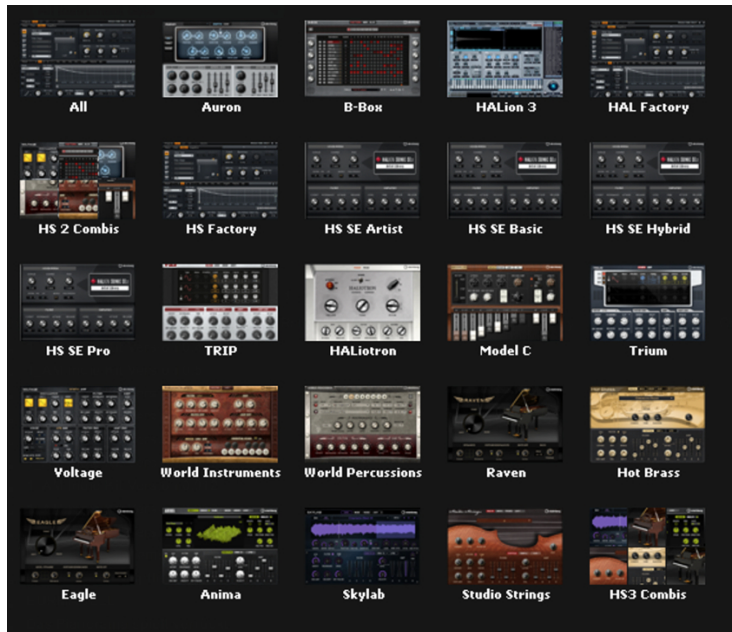
Attribute Filter

- To set up the filter, click on specific values in the columns.
- To select different filter criteria, click the column header and select a different attribute from the submenu.

Only the files that match the set filter are displayed in the results list.

Using User Icons for Content Libraries

The **Select Content Set** pop-up menu allows you to filter presets according to their library name. To be able to filter out your user presets, you can set up a custom library name for your user presets in the **MediaBay**. By default, the pop-up menu displays user libraries with a generic library icon, but you can also set up your own icons for your libraries.

PROCEDURE

1. Open the **Select Content Set** pop-up menu.
2. Right-click the icon for your custom library and select **Select Custom Library Icon**.
3. Navigate to the file that you want to use, and select it.
   You can only use `.jpeg` or `.bitmap` files.
4. To remove a user icon from a library, right-click it and select **Remove Custom Library Icon**.

RESULT

The new icon is shown in the **MediaBay** and on the **Select Content Set** pop-up menu.

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 according to the category filter.

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 is updated immediately 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 Search Text** next to the search field.

To restrict the search to the names only, activate **Search Names Only** ⊞. This way, other attributes are not taken into account.

View Filters

The toolbar has three filter buttons that allow you to define which preset types to display: multis ⊞, programs ⊞, or layers ⊞. In the results list, the corresponding icon is shown to the left of the preset name.

Rating Filter

You can limit the results list according to the rating of the presets. Use the rating slider to define the minimum rating.

Content Filters

The content filter buttons allow you to define whether to show the entire content ⊞, only the factory content , or only your user content .

Show Program Structure

Allows you to look inside multis, programs, and layers. This allows you to load only specific components, for example.

Rescan Disk

Rescans the disk for files that match the search criteria. Click this button if you added or removed files on your hard disk, for example.

Set Up Result Columns

Allows you to select which attribute columns to display on the toolbar.

Results Counter

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

RELATED LINKS

Configuring the Results List

You can specify which file attributes you want to be displayed in the results list and set up the column order so that this attribute is visible without scrolling. This allows you to find the files that have a particular attribute more quickly.

● To configure which attributes are 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.

● 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

Programs from the factory content are 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 load only 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, or layer.
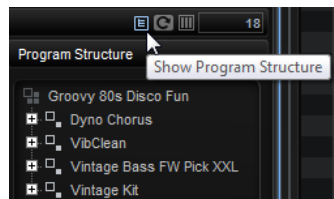
2. Navigate through the tree structure and select the items that you want to use, for example, a program within a multi, a single layer of a program, or a single zone.

> **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

Presets can be described by using a predefined set of attributes.

PROCEDURE

1. In the **New Preset Attributes** section of the **Save** dialog, click in the field of the attribute value that you want to set.

Depending on the attribute, a menu or a dialog opens.

2. Select a value.

Attribute values are written into the corresponding preset 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.

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 in another folder than the default folder, you must register these files in the **MediaBay**.

PROCEDURE

1. In the top right of the **MediaBay**, click **Import FXB/FXP/HSB/VST Sound** and select **Register HSB/VST Sound Files**.
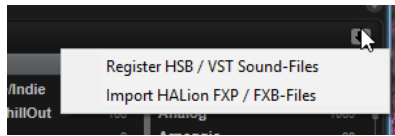
2. Navigate to the files, select them, and click **OK**.

   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 right of the **MediaBay**, click **Import FXB/FXP/HSB/VST Sound** and select **Import HALion FXP/FXB Files**.
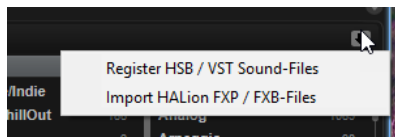
2. Navigate to the folder that contains the FXP/FXB file.

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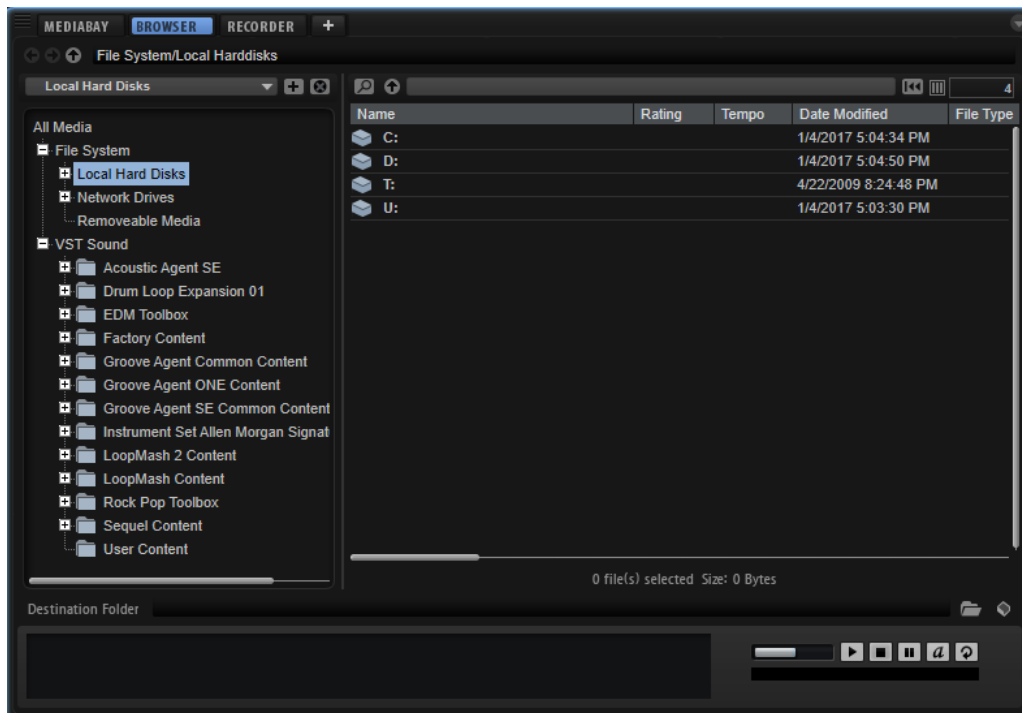
In the **Browser**, you can search and load the following files:

● Samples and zones from the file system or from within loaded programs.
This also includes program formats from other software and hardware samplers.

● Programs, layers, and sublayers.

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 navigation history, click at the very right of the path field.

Location Tree

The location tree on the left in 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.
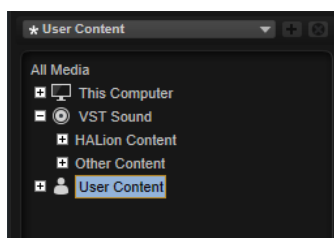
If you select an entry in the tree, the results list shows the corresponding content.

Location Tree Context Menu
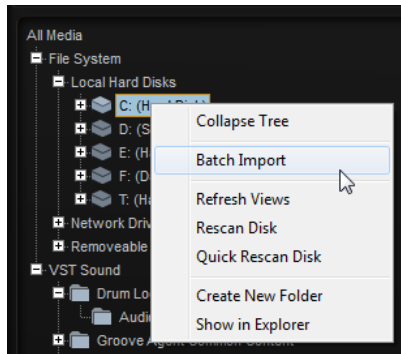
Batch Import

Select this command 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.

Rescan Disk

Rescans the selected element in the tree. The corresponding files are opened, the information is extracted, and the database file is updated accordingly.

Quick Rescan Disk

Rescans only the folders that have changed since the last scan.

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

Shows the location of the selected file on your system.

Locations

You can save folders or directories on your system as favorite locations for quick access.
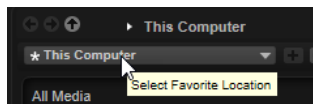
The text field above the tree shows the name of the selected folder. If the name is preceded by an asterisk, the folder has not been saved as a location yet.

Managing Locations

- 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**.

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 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.

- To move up one level in the folder hierarchy, click **Browse Containing Folder**.

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**.

Configuring the Results List

You can specify which file attributes you want to be displayed in the results list and set up the column order so that this attribute is visible without scrolling. This allows you to find the files that have a particular attribute more quickly.

- To configure which attributes are 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.

- 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 Location Content** button and enter the search text in the text field.

3. Optional: Click the button to the right of the search field to specify whether you want to search for samples, MIDI files layers, programs, multis, or all types.

4. To start the search, press **Return** or click **Search/Stop Search** to the right of the search text.

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 10,000.

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

Preview and File Info Sections

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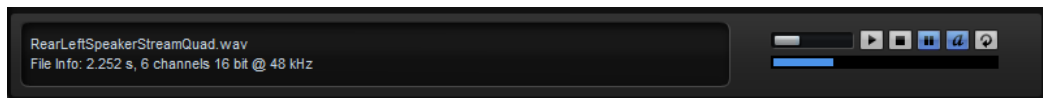
File Info Section

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

● For samples, length, channels, bit depth, and sample rate are shown. 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 play locator 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 always 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 in the results list does not trigger the sample if a sequence from the host or the internal **Style Player** or **MIDI Player** are 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

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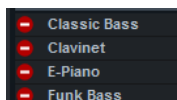
Protected programs and layers are shown with a lock icon to indicate that you cannot extract single zones or samples. However, you can load the programs as a whole.
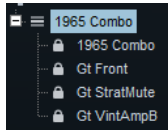
NOTE

These icons only appear after selecting the programs.

RELATED LINKS

Loading Files from HALion 3

You can load FXB and FXP files from HALion 3. These files can be located in a directory on 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 on 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

Loading Third-Party Sampler Programs

The supported third-party sampler programs appear as nodes in the location tree. You can load entire programs, or 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 partition or folder to the **Slot Rack** or the **Program Table**. Any contained programs are then loaded. This is different to 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.

Working with General MIDI Files

HALion can play back files in the General MIDI format. For this, the following preparations must be made:

PROCEDURE

1. Load a GM multi from the **MediaBay**.

   The first 16 slots are prepared with send effects for chorus and reverb.

2. Open the **Options Editor**, navigate to the **MIDI Controller** section, and activate **Receive Program Changes** and **Receive RPNs 0/1/2**.

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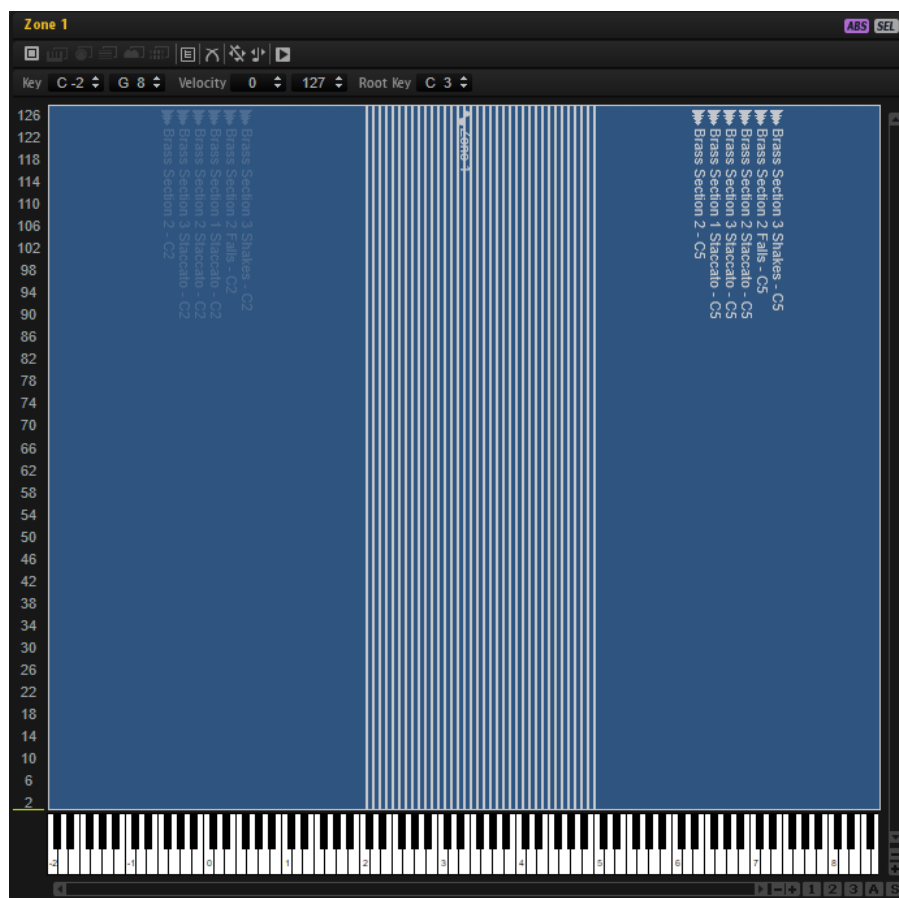
Zones are displayed as boxes. Overlaying zones are semi transparent, so that overlapping areas can easily be recognized. Selected zones have a red border, and the focused zone has an orange border. To set the focus on a zone, click on it or select it on the **Focused Zone** pop-up menu above the toolbar.

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, you have the following possibilities:

- **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** and click a key to play this key and the following keys ten times each, at increasing velocities from 1 to 127.

Toolbar
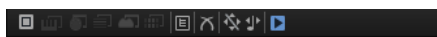
MIDI Mapping Selection Options

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 from 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 up 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 sample.

Keyboard

The keyboard indicates with which keys a zone can be triggered. 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
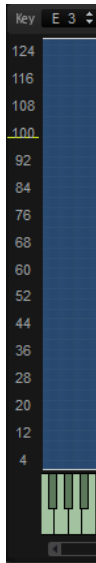
The velocity scale on the left provides an orientation when you adjust the velocity range of a zone. In the background of the scale, a meter indicates the incoming velocity value. After each note, the meter automatically falls back to zero and leaves a marker on the last velocity value.

Mapping Editor Context Menu
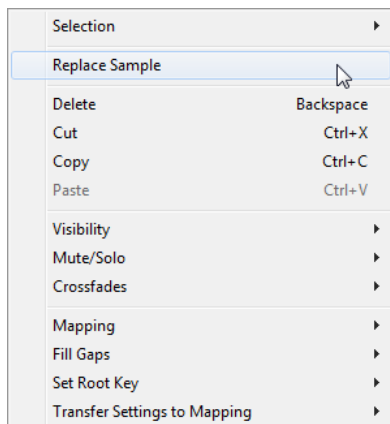
Selection

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 certain 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. Then, the remaining gaps on the velocity axis are filled.
- **Velocity and Pitch** first fills the gaps on the velocity axis. Then, 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, 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 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 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** and click the corresponding key on the keyboard.

Moving Zones

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**. 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

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 the 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.

- 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.

Zoom Snapshots

Zoom snapshots save the zoom factor and 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.

- To save the current state of the editor as a snapshot, **Shift**-click one of the numbered buttons to the right of the scrollbar.
- To load a zoom snapshot, click the corresponding button. The button color changes if a snapshot is active.

NOTE

If you perform any manual zooming or scrolling, the zoom snapshot is deactivated.

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 first selected sample gets the highest velocity and the last selected sample the lowest velocity.

- If you press **Ctrl/Cmd** and move the mouse pointer to the bottom of the mapping view, 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
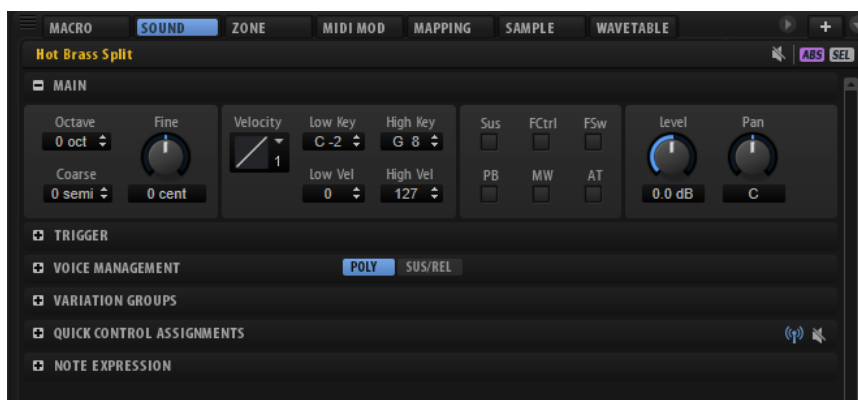
In the **Sound Editor** for programs and layers, you can find the parameters that are set globally for an entire program or layer. For example, you can transpose the pitch, adjust level and pan, and limit the playback to a specific area on the keyboard.

Programs and layers share the same set of parameters.

Main Section
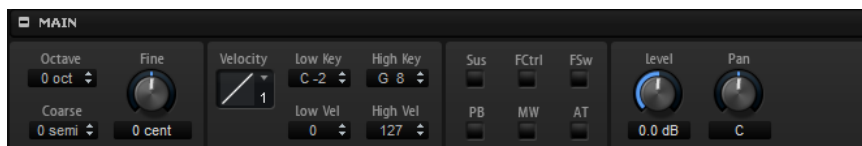
The **Main** section contains basic settings.

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 allows you to control the trigger and release behavior.
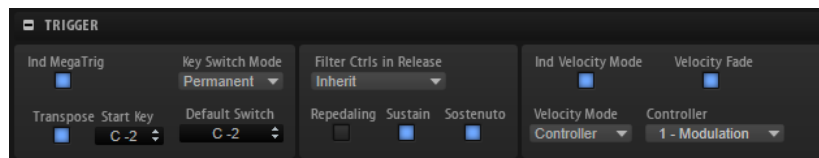
Individual MegaTrig Management

This button is only available for layers. If you want the key switch assignments across different layers to work individually, activate **Ind MegaTrig** for these layers. This can be necessary if two layers with different key switches are used together 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 is 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 used 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 is 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. The effect is that the strings play on. You can achieve a similar effect with the **Repedaling** option. If you release and press the pedal within the release 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. Notes that are held while pressing the sostenuto pedal sustain. Successive notes do not sustain.

Individual Velocity Mode

Sample-based instruments often use crossfade techniques to optimize the 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

The switching or crossfading between zones can be controlled via velocity or MIDI controller.

- 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.

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**.

Velocity Fade

Activate this option to use 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.

RELATED LINKS

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** – New 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** are 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 have an 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 allows 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 last note that you played 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

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. To define which samples are triggered as variations, you can assign 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.
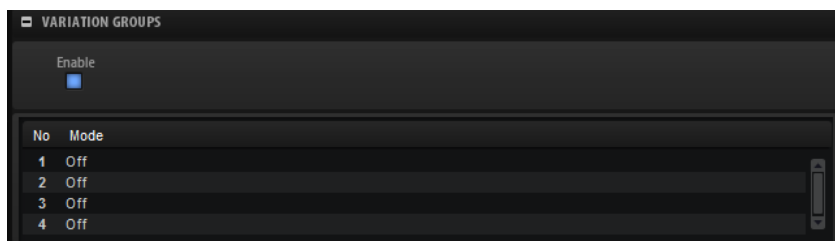
Enable

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 directly repeated.

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.

Quick Control Assignments Section

This section allows you to manage and edit the assigned quick controls.
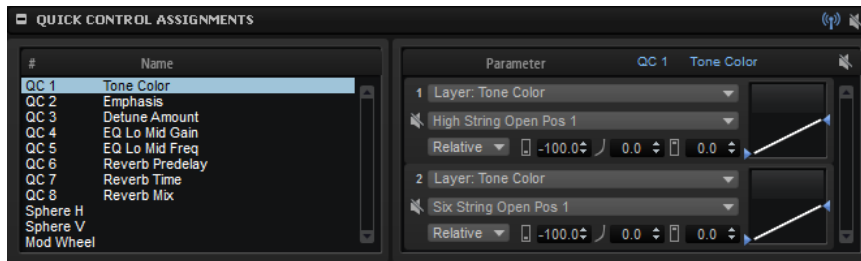
How to work with the quick controls is described in a separate section.

RELATED LINKS
Quick Controls on page 25

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 what their influence on the sound will be.
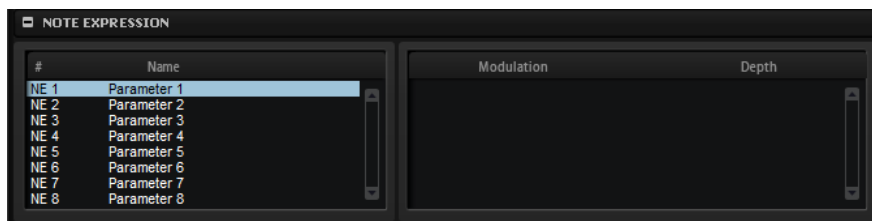
How to work with the Note Expression parameters is described in a separate section.

RELATED LINKS
Note Expression on page 546

Editing Zones

You can edit zones in the **Zone Editor** or in the **Sound 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.

| Synth Zone |
| Sample Zone |
| Granular Zone |
| Organ Zone |
| Wavetable Zone |
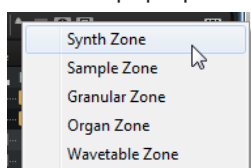
Zone Types

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 for resynthesis of a sample, that is, only a few waves are necessary to reproduce the original character of any sample.

If not explicitly stated, the functions described in this chapter apply to all zone types.

Adding Samples to Empty Zones

Depending on the zone type, it can be necessary to fill the created zone with sample material. This applies to sample zones, granular zones, and wavetable 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** or 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**.

- 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.

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.

- 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 %.

- If you use relative editing and you change a parameter from 50 % to 60 % in one zone, another selected zone that was set to 70 % is set to 80 %.

NOTE

Relative changes can be made for all parameters that can be adjusted continuously. Changes of parameters that select one of multiple modes or switch between two states are always absolute.

Global Zone Settings

The global section at the top of the **Zone Editor** allows you to set up basic zone parameters.
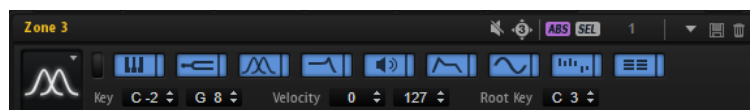
Mute Zone

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.

Zone Type

Allows you to select a zone type.

You can change the zone type of existing zones. For example, 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. 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.

Show All Sections/Show First Section

Allows you to switch the display between showing all sections and showing only the first activated section.

Section buttons

The section buttons allow you to customize the section display and to facilitate navigating between sections. For each section, one button is available.

The buttons can be activated, deactivated, or locked.

Low Key/High Key

These parameters determine the lowest key and the highest key on which the zone is triggered.

Low Velocity/High Velocity

These parameters determine the lowest velocity and the highest velocity on which the zone is triggered.

Root Key

The root key determines the pitch of the zone. Samples can contain root key information embedded in the file, which means that when loaded, they are automatically mapped to the corresponding keys.

RELATED LINKS

Managing Sections

If you activate a section button, the corresponding section is shown. As soon as you click another button, the section is automatically hidden and the new section is shown.

If you lock a section by clicking the button directly to the right of the 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 button to the left of the section buttons to toggle between showing and locking all sections, and showing only the first section.
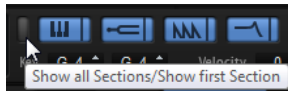
- If only one button is active, but not locked, you can click another button to switch exclusively between the sections.

- Having 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 those sections you need for a given workflow, and save them in a screen set.

RELATED LINKS

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:

Trigger Tab

On the **Trigger** tab, 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 of 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 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 only by the amplifier section of the zone.

● 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 takes 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 adjusts how much the selected option affects the level of the note-off samples.

Note-off Trigger

Triggers the zone at note-off events instead of note-on events.

Unison Tab

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 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 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.

NOTE

This parameter is always visible, even if **Unison** is deactivated. This is because it does not only affect the voice distribution of the zone unison, but also the voice distribution of the wavetable and synth oscillators that have their own independent multi-oscillator settings.

Glide Tab

Glide allows you to bend the pitch between notes that follow each other. You achieve the best results in **Mono** mode.
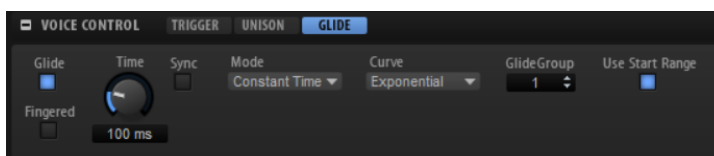
Glide On/Off

Activates/Deactivates **Glide**.

Fingered

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.

Sync

Activate **Sync** to synchronize the delay 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 **T** 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 at continuous speed from the start to the end pitch.
- With the **Exponential** curve, the pitch starts gliding at 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 in semitones from the start to the end pitch.

Glide Group

If you assign zones to glide groups, you can set the glide effect independently for the zones. 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**. If this is activated, the sample does not start from the beginning, but from the position you set with the **Sample Start Range** parameter.

RELATED LINKS
Voice Groups on page 81
Sample Oscillator Section on page 96

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.

PROCEDURE

1. Add two sample zones: one for the note-on samples and one for the note-off samples.

2. Set up the mapping of the zones in the **Mapping Editor**.

3.   In the **Voice Control** section for the zone that contains the note-off samples, activate **Note-off Trigger**.

4.   Make sure that all keys on which a sample ends with a note-off contain a corresponding sample that starts with a note-off.

5.   Play a note.

   When you now release the key, the corresponding note-off sample is played.

> NOTE
>
> If you want to have more control over the level of the note-off sample, you can use the MegaTrig MIDI module instead.

RELATED LINKS

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 of 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 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 for 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.
- On 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 78

Pitch Section

On 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 for 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.

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 by MIDI note number. Set this parameter to positive values in order to raise the pitch the higher you play. Use negative values to lower the pitch the higher you play. 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 **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 113

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 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, where each is 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 as slave or master. 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 a master oscillator is modulating the pitch of a slave oscillator at the rate of the audio sample. The **Waveform** parameter adjusts the pitch ratio between slave and master oscillator, resulting in a sound close to 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 close to 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 modulation destination in the modulation matrix.

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.

OSC 1/2/3 Level

Adjusts the output level of the oscillator.

NOTE

Waveform, pitch, and level of oscillator 1, 2, and 3 can be modulated separately in the modulation matrix.

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 **MO** button.

If **Multi-Oscillator** mode is activated, you can click the edit button to show the corresponding parameters.

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 with 100 %, you create a stereo signal.

NOTE

The pitch distribution of the oscillators is determined by the **Distribution** control in the **Voice Control** section.

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 between 0 and 360 degrees.

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

The wave shape of the sub oscillator. You can choose between **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, and **Pulse Narrow**.

Level

Adjusts the output level of the sub oscillator.

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 between 0 and 360 degrees.

Ring Modulator

Ring modulation produces 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 124

Sample Oscillator Section

This section is available for sample zones. It contains various playback and loop parameters.
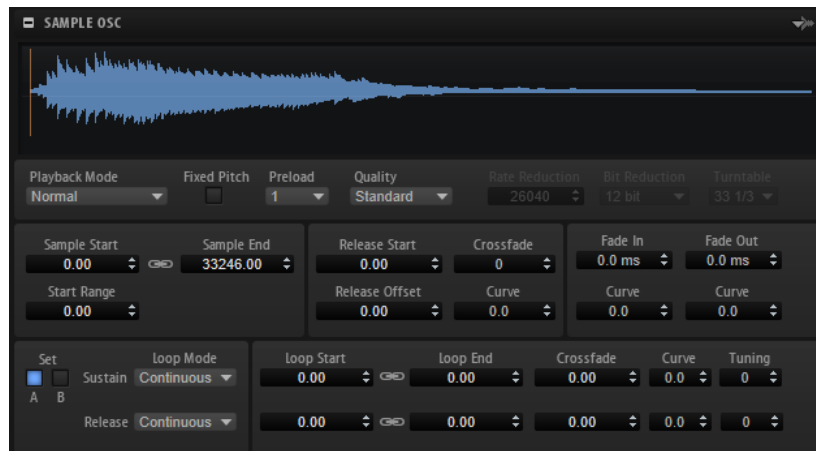
Load/Replace Sample

    This button on the right side of the section header allows you to load an initial sample or to replace the current sample. In the dialog, you can listen to the samples, to select the best match for your working situation.

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 on 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. If **Fixed Pitch** is 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 can be useful 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 with 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.

Changing the quality setting is particularly noticeable in 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 select the bit depth that was used by early samplers.

- **Turntable** emulates the memory-optimized workflow of the past, where turntables were sampled at a speed of 45 RPM to record shorter samples, and then tuned down again to correct for the change in pitch.

   If you set this parameter to **78 RPM**, you can increase the vintage artifacts that are produced.

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.

Link Loop Start and End

Links the loop start and end positions. If you edit one of the values, the other 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.

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 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 alternates forward and backward 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 alternates forward and backward 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 only to the loop end.

Loop Start

The loop start for the sustain loop and for the release loop.

Loop End

The loop end for the sustain loop and for the release loop.

Tuning

Sets the tuning of the loop. This is useful to adjust the frequency of the loop.

Organ Oscillator Section
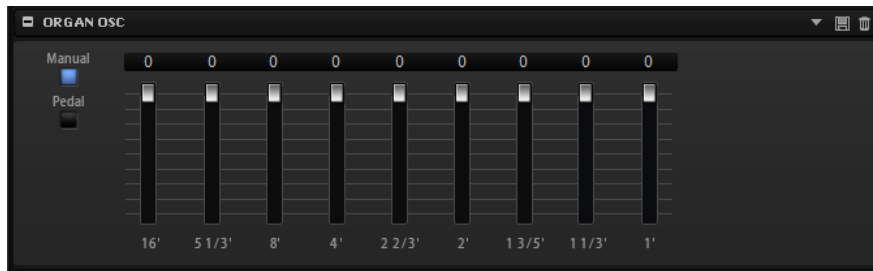
Organ zones produce the sound of classic drawbar organs with up to nine drawbars. Each drawbar controls the level of a harmonic. The drawbars are named after the length of church organ pipes, ranging from 16' to 1'. 16' is the lowest and 1' the highest harmonic. You can mix the harmonics using the drawbars 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** gives access to the oscillator parameters of wavetable zones. The oscillator is a combination of two wavetable oscillators, one sub oscillator, and one noise oscillator that can be mixed with individual settings, such as 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 these. The **Sub** tab contains the settings for the sub oscillator and the noise oscillator.

On the right in the title bar, you can find **On/Off** buttons for the four oscillators. This allows you to activate/deactivate an oscillator without having to open the corresponding tabs.

Osc Tabs

The wavetable oscillators 1 and 2 have the same parameters. For each oscillator, a separate tab is available.

Oscillator On/Off

Activates/Deactivates the oscillator.

Select Wavetable

This pop-up menu allows you to select a wavetable for the wavetable oscillator. You can choose between the included wavetables and the wavetables that you created in the **Wavetable Editor**.

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 between 0 and 360 degrees.

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.

NOTE

The **Position**, **Pitch**, **Level**, and **Pan** parameters of wavetable oscillators 1 and 2 can be modulated separately in the modulation matrix.

Position

Determines where the envelope 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 25.0 % and 75.0 %, set **Position** to 25.0 % and **Random Position** to 50.0 %.

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 negative or positive random 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 %, for example.

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 following notes start from the current playback position for as long as the first note is held.

Sync to Host

Allows you to sync the wavetable to the beats and measures of your host application.

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.

Key Follow

Adjusts how the speed of the wavetable envelope is affected by the note that you play. Values higher that 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.

Multi-Oscillator

For **Osc 1** and **Osc 2**, you can activate **Multi-Oscillator** mode. This allows you to create a richer sound by producing up to eight oscillators simultaneously.

● To activate **Multi-Oscillator** mode, activate the **On/Off** button in the **Multi-Oscillator** section.

Multi-Oscillator Number, Detune, Pan, 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.

● **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.

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.

Formant 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 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.

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.

On

> 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 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 behavior of the formant shift by setting **Key Follow** to negative values.

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

> The wave shape of the sub oscillator. You can choose between **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, and **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 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

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.

AudioWarp Section

In this section, you can apply time stretching and formant shifting to the audio in your sample zones.
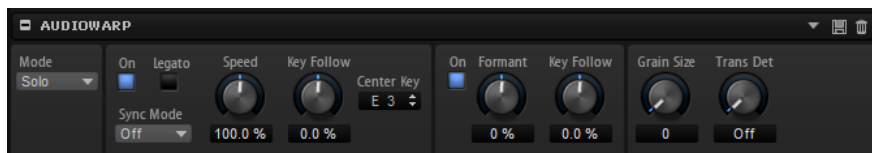
Mode

On the **Mode** pop-up menu, you select the mode that is used for the AudioWarp functions.

- **Off** deactivates the **AudioWarp** section.
- **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, for example, if they are used in presets. Depending on the size of the samples, the analysis process can take a while.

  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.

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. If the **Legato** button is 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 playing 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 somewhere 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 exact 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
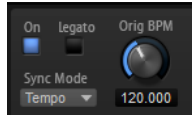
If **Sync Mode** is set to **Tempo**, you can enter the original tempo of the sample in beats per minute. The playback speed of the sample is adjusted to match the tempo of the host application.

Note Length and Number of Beats
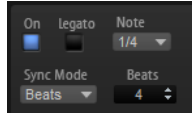
If **Sync Mode** is set to **Beats**, HALion calculates the tempo of the sample, based on the note length and number of beats that you enter.

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.

Positive values increase the playback speed of the sample the higher the notes you play. Negative values decrease the playback speed the higher the notes you play.

Center Key

Specifies the MIDI note that is used as the center position for **AudioWarp Key Follow**.

Formant Shift On/Off

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 in **Solo** mode.

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 sound better. 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 in **Solo** mode.

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 in **Solo** mode.

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.

RELATED LINKS
Modulation Matrix on page 124

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

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP 6+LP 18 and HP 6+LP 12 are combinations 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.
- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR 12+LP 6 and BR 12+LP 12 are combinations 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.
- BP 12+BR 12 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.
- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.
- HP 6+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 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**.

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 and opens completely towards the zone above.

Fatness

For the **Waldorf** and **HALion 3** filter types, this his 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 volume is higher the higher the notes you play. With negative values, the volume decreases the higher the notes you play.

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 how the loudness changes 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.

- If this parameter is 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.

- If this parameter is 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.

- If this parameter is 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 when HALion is loaded. After that, 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
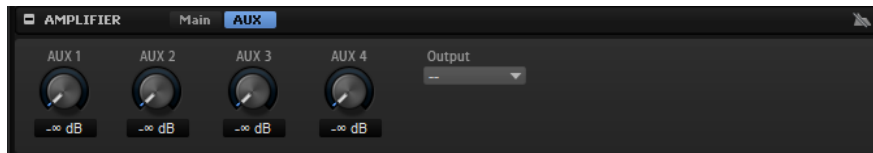
AUX 1-4

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 with the controls **AUX 1-4**.

Output

Zones can be routed to 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. For synth, sample, grain, and wavetable zones, the **Amp**, **Filter**, **Pitch**, and **User** envelopes are available. For organ zones, the **Amp** envelope is available. Each envelope is a multi-segment envelope with up to 128 nodes.
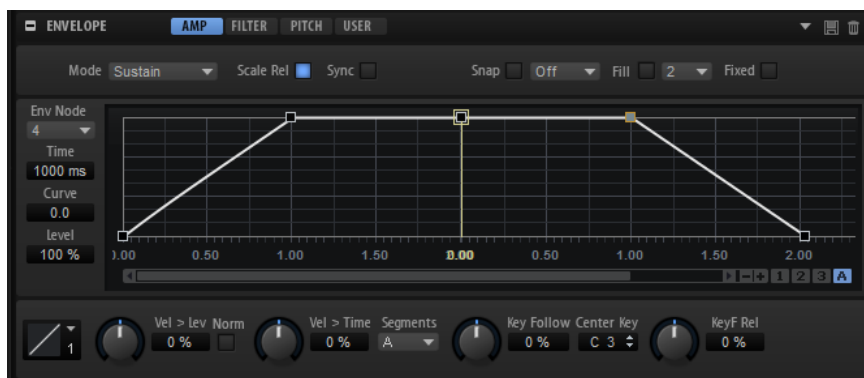
The **Amp**, **Filter**, and **Pitch** envelopes are pre-assigned to the amplitude, the filter cutoff frequency, and the pitch of the zone. The **User** envelope is freely assignable.

All envelopes can be used as sources in the modulation matrix.

- 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. The pitch envelope is bipolar, which means it allows for negative and positive values to bend the pitch.

- Click **User** to display the parameters of the freely assignable user envelope.

  The user envelope is bipolar, which means it allows for negative and positive values, for example, to modulate the pan from left to right.

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. Then, the loop is repeated for as long as the key is held. 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 following 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.

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 this way.

Sync

Allows you to synchronize the envelopes to the tempo of your host application.

Snap

If **Snap** 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.

Guide Envelope

On this pop-up menu, you can select a second envelope to be displayed in the background of the edited envelope.

- If **Snap** is activated, moved nodes snap to the guide envelope.

Fill

Allows you to add multiple envelope nodes after the selected nodes.

Fixed

- If **Fixed** is activated and you move selected nodes on the time axis, only the selected nodes are moved.

- If **Fixed** is deactivated, all nodes that follow the edited nodes are also moved.

Env Node

Displays the focused envelope node.

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.

Curve

Allows you to adjust the curvature of the envelope curve 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.

Level Velocity Curve

You can select the curve type to specify how the incoming velocity translates to the level of the envelope. The characteristic of each curve is displayed by a small icon.

Level Velocity (Vel>Lev)

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. Positive values increase the level of the envelope the harder you hit a key. Negative values decrease the level of the envelope the harder you hit a key.

Time Velocity (Vel>Time)

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

Here, you can select which phases of the envelope are affected by the **Time Velocity** parameter.

- **Attack** – The velocity affects the attack only.

- **Attack + Decay** – The velocity affects all phases until the sustain.

- **Decay** – The velocity affects all phases until the sustain 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 set **Center Key**, that is, the envelope becomes faster the higher the note you play.

- Negative values increase the phase lengths for notes above and decrease the phase lengths for notes below the **Center Key**, that is, the envelope becomes slower the higher the note you play.

RELATED LINKS

Zooming

The vertical axis of the graphical envelope editor displays the level. The horizontal axis displays the time.

- 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**, click and drag the mouse over the region.

Zoom Snapshots

Zoom snapshots save the zoom factor and 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.

- To save the current state of the editor as a snapshot, **Shift**-click one of the numbered buttons to the right of the scrollbar.

- To load a zoom snapshot, click the corresponding button. The button color changes if a snapshot is active.

NOTE

If you perform any manual zooming or scrolling, the zoom snapshot is deactivated.

Selecting Nodes

- To select a node, click on it in the graphical editor.

  The focused node is indicated by a frame. The value fields to the left of the graphical envelope editor display the parameters of the focused node.

- If multiple nodes are selected, you can use the **Env Node** pop-up menu 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 and right arrow keys.

Adjusting the Time between Nodes

The **Time** parameter 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.

To specify the time between two nodes, do one of the following:

● Select two adjacent nodes and enter a new value in the **Time** field.

● Drag a node to the left or the right in the graphical envelope editor.

● 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.

Adjusting the Level of the Nodes

The **Level** parameter specifies the amplitude of the selected envelope node.

The **Amp** and **Filter** envelopes are unipolar. Therefore, the value range for the level is 0 % to +100 % (positive values only). The **Pitch** and **User** envelopes are bipolar. Therefore, the value range for the level is from -100 % to +100 % (negative and positive values) for these envelopes. You can change the polarity of the envelopes in the modulation matrix, to map the range of the amplifier envelope (unipolar) to the **Pan** parameter (bipolar), for example. However, the envelopes always display their values with their default polarity.

To set the level of a node, do one of the following:

● Select a node and enter a new value in the **Level** field.

● Drag one or multiple selected notes up or down in the graphical editor.

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** while dragging.

Adjusting the Curve between Nodes

The **Curve** parameter allows you to adjust the curvature between two nodes from linear to logarithmic or exponential behavior.

To adjust the curve, do one of the following:

● Select the node or nodes that you want to adjust and enter a value in the **Curve** field. Positive values change the curvature towards logarithmic and negative values towards exponential behavior.

● Click on the curve between two nodes in the graphical envelope editor and drag up or down.

Ctrl/Cmd-click a curve to reset it to linear.

Adding and Removing Nodes

● To add a node, double-click at the position where you want to add the node.

● To remove a node, double-click it.

● To delete several selected nodes, press **Delete**.

NOTE

● You cannot remove the first, the last, or the sustain node.

● All nodes added after the sustain node always affect the release phase of the envelope.

Adding Nodes Using the Fill Function

The **Fill** function allows you to add multiple envelope nodes after the selected nodes.

PROCEDURE

1. On the pop-up menu to the right of the **Fill** button, select the number of nodes that you want to add.

2. In the graphical envelope editor, select the node after which you want to add nodes.

   If several nodes are selected, the new nodes are inserted after the last selected node.

   If **Fixed** is deactivated, the added nodes are placed with the interval specified by the **Time** parameter of the selected node. If multiple nodes are selected, the interval is specified by the focused node.

   By activating **Sync**, you can specify the interval with the **Sync** note value. For example, if 1/4 is selected, new nodes are added at exact quarter note intervals.

   If **Fixed** is activated, the added nodes fill the space between the last selected node and the following one.

3. Click the **Fill** button.

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.
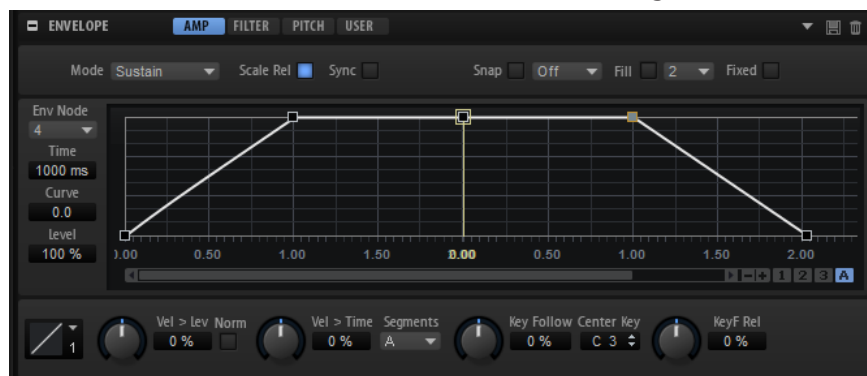
2. Deactivate **Scale Rel** and play and release a note in the middle of the attack, halfway between node 1 and 2.

   The level of node 4 is not altered. However, the sustain level is scaled down and therefore increases when going from the sustain node to node 4.

3. Now, 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 will not change when going 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. Click **Sync** to activate sync mode for the envelope.

    Sync mode is active if the button is highlighted. A grid spaced in fractions of beats is displayed in the graphical envelope editor.

2. On the pop-up menu located to the right of the **Sync** button, select a note value.

    This sets the resolution of the grid.

    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.

3. To use triplet note values, activate the **T** button.

    NOTE

    - Envelope nodes that do not exactly match a note value display the closest note value.
    - Nodes that exactly match a note value 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.

    You can also enter note values and triplets manually in the value field.

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, and wavetable zones offer two polyphonic LFOs.

LFO 1 and LFO 2
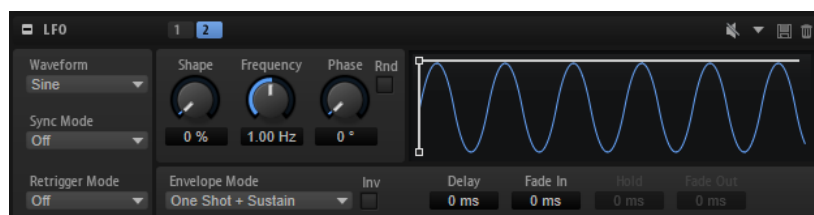
Polyphonic means the LFOs are calculated per voice allowing for independent modulations with each triggered note. You can use this to create a richer sound, for example, with an independent pitch modulation per note. The LFOs can be assigned freely in the modulation matrix and they have an additional envelope that allows you to shape the modulation intensity over time.

You can also configure monophonic LFOs using the Mono LFO MIDI Module.

To access the LFOs, click the corresponding button at the top of the LFO section.

You can adjust the times of the envelope in the graphical editor by dragging nodes left or right.

NOTE

Which nodes are available in the graphical editor depends on the **Envelope Mode** setting.

- 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.

LFO Waveform and Shape

- **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 produced.
- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned right.

Sync Mode

The Sync Mode is used to match 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 Mode

Determines whether the LFO is restarted when a note is triggered. The waveform restarts at the position set with the **Phase** parameter.

The polyphonic LFOs can switch between **On** and **Off**.

- If this parameter is set to **Off**, the LFO runs freely.

- If this parameter is set to **On**, the LFO starts with each triggered note.

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.

Delay

Determines the delay time between the moment you play a note and the moment the LFO comes into effect.

Fade In

Determines how long the LFO takes 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 how long the LFO takes 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.

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.

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.

RELATED LINKS
Mono LFO on page 518

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

- If **Off** is selected, you can adjust the speed at which the sequence repeats.

  Whether the sequence restarts when you play a note depends on the **Retrigger Mode**.

- If **Tempo + Retrig** is selected, you can 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**.

- If **Tempo + Beat** is selected, you can 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. The **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.

Triplet

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 at which 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 only for rising edges.
- **Slope on Falling Edges** creates ramps only for falling edges.
- **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

These commands 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** and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift-Alt** 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 next step.

Producing Modulations in Steps of Semitones

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 Matrix

The concept of controlling one parameter by another is called modulation. HALion offers many fixed assigned modulations, such as the amplitude and filter envelopes, or pitch key follow. In the modulation matrix, you can assign additional modulations.

Assigning modulations means interconnecting modulation sources, like LFOs and envelopes, with modulation destinations, like pitch, cutoff, amplitude, etc.
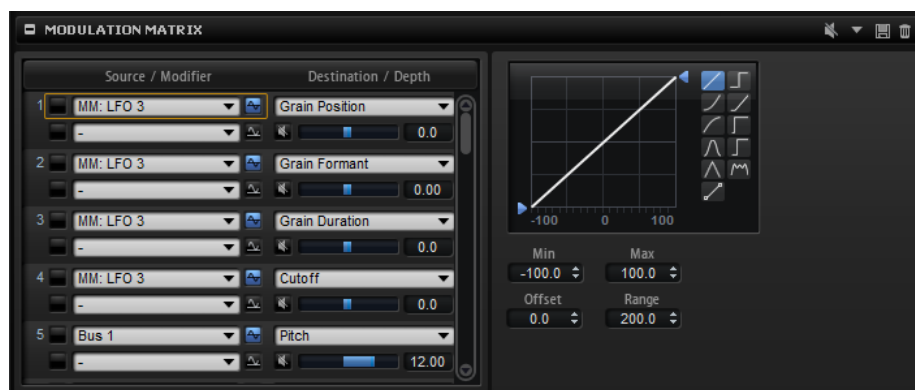
The modulation matrix offers you up to 32 freely assignable modulations, each with a source, an offset parameter, a modifier, and a destination with adjustable depth. All modulation sources and destinations can be assigned several times. The polarity of each source can be switched between unipolar and bipolar. An additional modifier and user-definable curves and ranges give you further control over the modulation.

The modulation matrix is divided into two sections. On the left, you can assign modulation sources to destinations and adjust the modulation depth. The section on the right contains settings for the curve and range editor, where you can make further settings for the selected modulation source.

Creating Modulations

PROCEDURE

1.   Select the zone that you want to adjust.

2.   Open the **Modulation Matrix** section.

3.   Select a modulation source and a modulation destination, for example, **LFO1** as source and **Pitch** as destination.

4.   Use the horizontal fader below the destination to adjust the modulation depth.

5.   Optional: Click the **Source 2** field and select a modifier or change the polarity of the source.

       For example, select **Pitch Bend** as modifier and set it to unipolar.

6.   Optional: Use the curve and range settings on the right to limit the modulation range or to adjust the characteristics of the modulation.

Modulation Matrix Context Menu
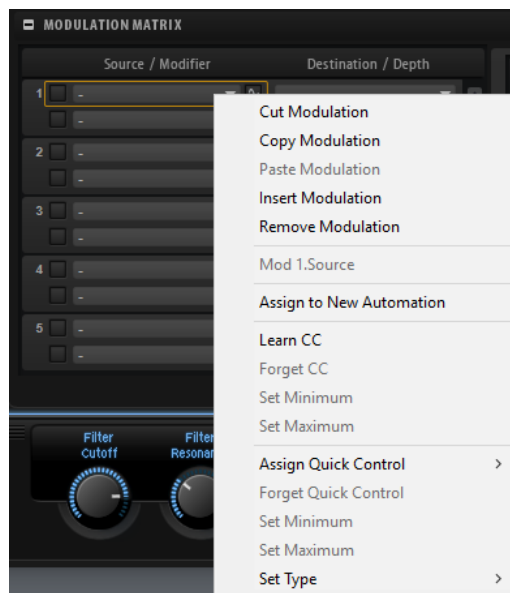
Cut Modulation

    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 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 automation parameter.

Learn CC

Allows you to assign a MIDI controller to the modulation slot.

Forget CC

Removes the MIDI controller assignment for 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.

Modulation Matrix Parameters

Modulation Sources

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. This modulation source is unipolar. The shape of the envelope determines the modulation signal.

Pitch Envelope

The pitch envelope. This modulation source is bipolar. The shape of the envelope determines the modulation signal.

User Envelope

The user envelope. This modulation source is bipolar. 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 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

The note-on velocity is normalized according to the velocity range of the corresponding sample zone. At the lowest velocity of the zone, the modulation is 0, at the highest velocity, the modulation is 1.

Note-off Velocity

Note-off velocity can be used as 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 modulation signal. This modulation source is bipolar.

Modulation Wheel

> The position of the modulation wheel can be used as modulation signal. This modulation source is unipolar.

Aftertouch

> Aftertouch can be used as 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 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, 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 modulation signal. You can select the quick control from the corresponding submenu.

Note Expression

> This submenu lists the eight Note Expression parameters that can be used as modulation signals.

MIDI Modules

> This submenu lists the available MIDI modules that can be used as 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 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.

Modulation Modifiers

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 using the wheel.

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.

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, click its **Polarity** ⬙ button.

Modulation Depth

The horizontal fader below the destination adjusts the modulation depth.

Bypass Modulation

Click the **Bypass** button on the left of the **Modulation Depth** fader to bypass the modulation.

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 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 you play, 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 you play, assign the modulation wheel.

Level

This modulation adds to the level setting. It can be used to create level offsets using the mod 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 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. 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 multi-oscillator mode.

Osc 1/2/3 Multi Pan

Modulates the pan position of the individual oscillator voices that are produced by multi-oscillator mode.

Osc 1/2/3 Multi Voices

Modulates the number of oscillator voices that are produced by 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.

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.

Curve and Range Editor

You can set up a curve and range for each modulation source.

● The curve editor allows you to change the characteristics of a modulation. The displayed curve is superimposed on the modulation source.

This way, you can change the modulation from linear to exponential or logarithmic, for example.

● By setting the minimum and maximum values, you limit the modulation to a specific range only. In addition, you can specify an offset and a range for the modulation.

For example, with an offset and range of +50 %, only the second half of the displayed curve is superimposed on the modulation.

● If a MIDI or Note Expression controller is selected as modulation source, the **Smoothing** parameter is available. This allows for parameter changes to occur more gradually. Set this to **Default** to use the global **Smoothing** parameter set up in the **Options Editor** or enter a value in the value field.

The curve editor offers different presets that you can select by clicking the corresponding button on the right of the curve editor. To set up your own curve, click **CustomCurve** .

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.

Editing Samples in the Sample Editor

The **Sample Editor** allows you to view and edit samples. In HALion, samples are associated with sample zones. 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.

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.

Toolbar

The toolbar contains tools for editing sample markers, loop markers, and slices, for example.

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 play locator 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 left or right from the position where you clicked.

Snap

If this button is activated, the selection start and end points and 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 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.

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 instead of the original sample data. 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

Set this to **t** (transition) to search for short loops or 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. That way you can prevent the resulting loop from becoming static.

If this is set to **T**, 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.

Pitch Detection Sensitivity

Allows you to adjust the pitch detection curve. For example, if the pitch detection curve changes too fast or if it contains wrong pitches, lower the **Pitch Detection Sensitivity**.

Detected Pitch

The detected pitch at the current marker position.

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.

Info Line

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.

Show Selection/Sample Parameters

Switches the info line between displaying the parameters for the selection or for the entire sample.

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 sample.

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
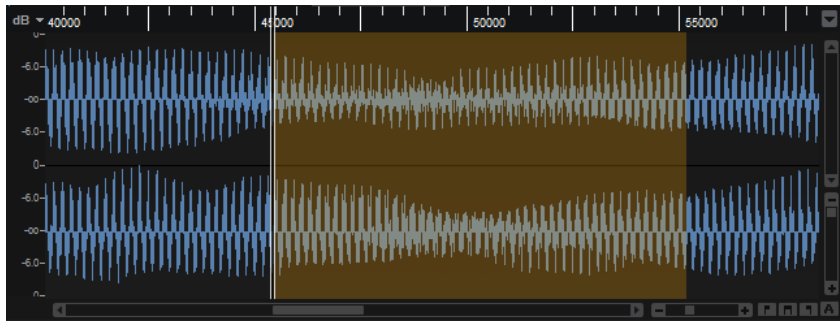
The waveform display shows the waveform image of the sample. To the left of the waveform display, a level scale is shown, indicating the amplitude of the audio.

- 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 on 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

Channel View Options

You can display either all channels, a specific channel, or the sum of all channels by activating the corresponding button to the left of the waveform display. If no selection is made here, all channels are displayed.

NOTE

Which channel selector buttons are available depends on the sample file.

Show Fades in Wave

If this button is activated, your fade settings are displayed directly in the waveform.

Show Gain in Wave

- If this button is 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 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.

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 further 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

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

Bypasses 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.

Parameter Section

The parameter section below the waveform display contains sample and sample zone parameters.

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.

Main Tab

The **Main** tab 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 on 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. If **Fixed Pitch** is activated, the relation between played note and root key is disregarded and all keys play the sample just as it was recorded.

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 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.

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.

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 Tab

This tab 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 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 alternates forward and backward 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 alternates forward and backward 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 only to the loop end.

Loop Start

The loop start for the sustain loop and for the release loop.

Loop End

The loop end for the sustain loop and for the release loop.

Link Loop Start and End

Links the loop start and end positions. If you edit one of the values, the other 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 Tab

The parameter section contains different parameters, depending on whether slices have been created or not.

If no slices have been created, the following parameters are available:
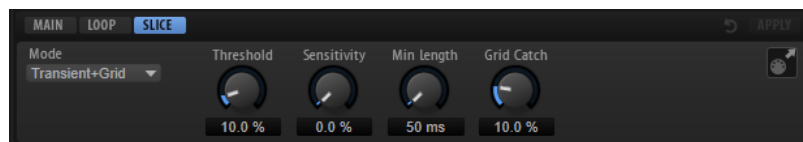
Slice Detection Mode

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 match 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**-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 button reads **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 on 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 modifications to the slice markers, to undo the slicing, and to remove the layer with the sliced zones from the **Program Tree**.

AUX Tab

If you have created slices, the **AUX** tab 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.

RELATED LINKS
Filter Section on page 108

Sample Editor Context Menu
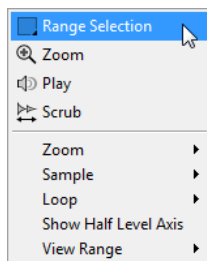
Range Selection Tool

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 left or 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 menu entry 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 32

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 96

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 wher 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.

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, right-click in the waveform of the sample, and select **Sample** > **Open in External Editor**.
  The external sample editor is launched and the sample is transferred.

  NOTE

  This menu entry 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.

Creating Loops

You can specify two independent loops, one for the sustain phase, and one for the release phase.

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.

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

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 or press **Shift** and drag the audio before or after the loop end marker to adjust the end or start position.
    -   To automatically detect suitable loop start and end positions, click the **Find Previous Loop Start/End** or **Find Next Loop Start/End** buttons.
        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 instead of the original sample data. 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**-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.

AFTER COMPLETING THIS TASK

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.

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.

Editing Parameter Curves

If you click the parameter name 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.

Replacing Samples

You can replace samples using the **Load/Replace Sample** button in the header of the **Sample Editor**.

Furthermore, the **Program Tree** allows you to exchange samples, for example, to replace the snare drum in a drum loop. This can be done by replacing the sample or the sample zone. 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.

●   In the **Program Tree**, drag the new sample or sample zone onto the sample or zone that you want to replace.

●   Drag the new sample or zone from the **Program Tree** onto the slice that you want to replace on the **Slice** tab.

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.

If you replace slices in the **Sample Editor**, 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.

NOTE

If you revert the slicing of a loop, all created zones are deleted and any replacement samples are also discarded.

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 of samples and align these to make up a wavetable. The waves in the wavetable are played back one after the other to create the sound progression. You can shape the sound as in the 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.

When HALion extracts a wave from a sample, a wavetable envelope is created. You can edit the envelope on 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 256 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 you want to use and where you make settings for them.

You can modulate the wavetable position automatically with the **Speed** parameter or manually in the modulation matrix.

RELATED LINKS

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 **Wavetable Editor** contains a sample display, a **Spectrum** tab, and an **Envelope** tab. At the bottom of the window, an overview of the wavetable that contains the extracted waves is displayed.

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.

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.

3D Map and 2D Wave Tabs

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.

Toolbar
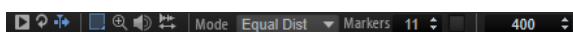
Play Sample

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.

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 left or right from the position where you clicked.

Marker Creation Mode

- If this parameter is set to **Equal Distance**, the markers are equally distributed over the sample.

- If this parameter is set to **Exponential**, the distances between the markers increase over the length of the sample.

- If this parameter is set to **Spectral**, the entire sample is analyzed and markers are only inserted if the change in the spectrum exceeds the set threshold.

- If this parameter is set to **Spectral Voiced**, the entire sample is analyzed and markers are only inserted if the change in the spectrum exceeds the set threshold and if a pitch is detected at this position.

NOTE

Markers are created automatically each time that you change the **Marker Creation Mode**, the **Number of Markers**, or the **Threshold**.

Number of Markers

The number of markers in the sample display.

You can enter the number of markers that you want to use directly in the value field.

Set Markers

Analyzes the sample and inserts markers, depending on the **Marker Creation Mode** setting.

Sample Position

The position of the selected marker in the sample.

Fixed Size

Sets the FFT window to a fixed size. This is useful if you want to extract a specific portion of a sample.

- If this button is activated, you can enter the size in number of samples in the **Window Size** value field.

NOTE

If the window size does not match the fundamental frequency of the sample, the extracted wave has digital artifacts.

Detected Pitch

The detected pitch at the current marker position.

Window Crossfade

Sets window crossfade.

NOTE

This option is only available for the **Rectangular** window type.

Window Size

Sets the size of the window.

Window Type

Allows you to select the window type.

Pitch Detection Sensitivity

Allows you to adjust the pitch detection curve. For example, if the pitch detection curve changes too fast or if it contains wrong pitches, lower the **Pitch Detection Sensitivity**.

Channel View Options

On the left of the waveform display, you can find the view options for the waveform.

If you use multi-channel samples, the buttons on the left of the sample display let you decide which channel is displayed and used for wave extraction. The channel setting is remembered for each extracted wave. This way, you can extract one wave from the left and another from the right channel, for example. By default, the wave is extracted from the sum of the audio channels.

Wavetable Envelope

On 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 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.
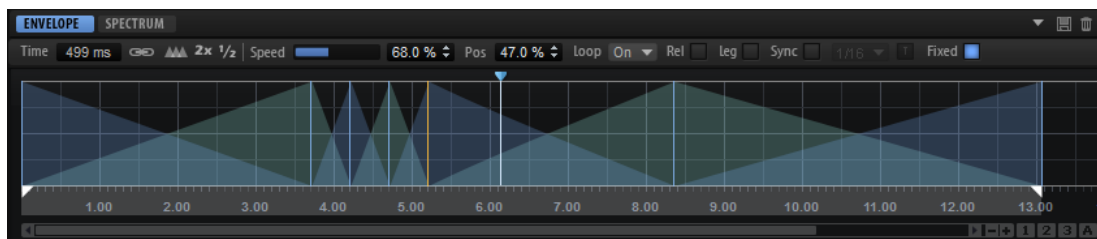
Time of Segment

> If you want to adjust 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

> The position of the cursor.

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 following notes start from the current playback position for as long as the first note is held.

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. On 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 enter note values and triplets manually 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

- If **Fixed** is activated and you move selected segments on the time axis, only these segments are moved.

- If **Fixed** is deactivated, all segments that follow the edited segments are also moved.

NOTE

Position, **Speed**, and **Direction** of wavetable oscillator 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.

Editing Selections

You can change the position and distribution of envelope markers within a multi selection of markers.

● To stretch 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 compresses the density of markers on one side and expands it on the other side.

Spectrum Tab

The **Spectrum** tab shows the amplitude and phase spectrum of the extracted wave, that is, the amplitude and phase for each harmonic.
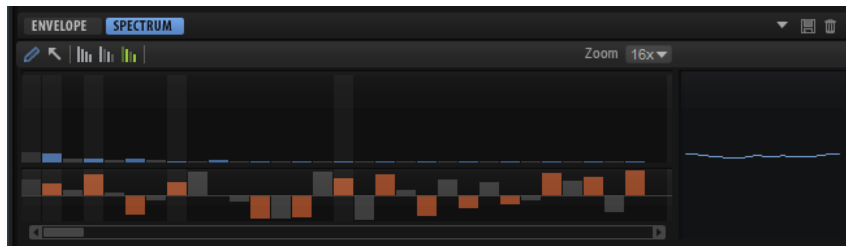
The lowest harmonic is displayed on the left, the highest harmonic on the right.

The overtones in the spectrum are represented through blue and orange bars. The blue bars represent the amplitude of the overtones, that is, the magnitude spectrum. The orange bars represent the phase of the overtones, that is, the phase spectrum. If the magnitude of an overtone is zero, the corresponding phase is grayed out. To get information on a particular overtone, move the mouse over its bar.

Draw Tool

If this tool is selected, you can 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** and drag.

● To adjust a single overtone, click it, hold down **Shift** and drag up/down.

● To set the magnitude or the phase of an overtone to zero, **Ctrl/Cmd**-click it.

To set the magnitude or phase of all overtones to zero, hold down **Shift-Ctrl/Cmd** and click.

NOTE

● If **Keep Original Phases** is activated, only the focused wave is affected.

● If **Align Phases** is activated and you adjust the phase of the focused wave, the following waves are also affected.

● If **Reset Phases to Zero** is activated, the phase spectrum cannot be adjusted with this tool.

Selection Tool

If this tool is selected, you can create range selections in the magnitude spectrum.

● Drag the tool to make a selection.
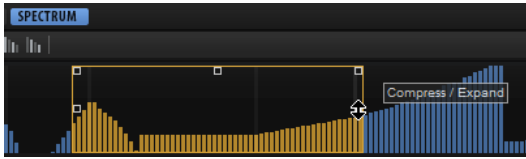
If a selection is made, you can use the handles of the rectangle to perform the following editing functions:

● To tilt the left part of the overtone curve, use the handle in the top left corner. This allows you to tilt the overtones at the start of the selection upwards or downwards.

Press **Ctrl/Cmd** to tilt the overtones using a shelving filter curve instead of the linear curve.

● To tilt the right part of the overtone curve, use the handle in the top right corner. This allows you to tilt the overtones at the end of the selection upwards or downwards.

Press **Ctrl/Cmd** to tilt the overtones using a shelving filter curve instead of the linear curve.

● To scale the overtones, use the handle in the center of the top border. This allows you to raise or lower the overtone values of the curve in percent.

Press **Ctrl/Cmd** to scale the overtones with a bell curve.

Press **Shift** to offset the overtones.

● To scale the overtones around their relative center, use the handle in the middle of the left and right borders. This allows you to raise or lower the overtone values horizontally around the center of the selection.

● To select all overtones of the same pitch in all octaves that are higher than the current octave, double-click an overtone.

NOTE

This automatically switches to **All Harmonics** mode.

NOTE

Only non-zero values can be edited with this tool.

Harmonics buttons

You can edit all harmonics, or you can choose to apply your editing only to even or to odd harmonics.

● Select **All Harmonics** to edit all overtones.
● Select **Odd Harmonics** to edit only the odd-numbered overtones.
● Select **Even Harmonics** to edit only the even-numbered overtones.

Zoom

Allows you to choose between six predefined zoom factors.

Wavetable Overview

At the bottom of the **Wavetable Editor**, you 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 256 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.

  NOTE

  You can only add consecutive waves to a multi-selection.

- 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** 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.

- 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.

Create New Wave

Allows you to create a new wave of the selected type and insert it to the right of the selected wave in the wavetable.

Duplicate

Duplicates the selected waves.

Delete

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.

Insert 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.

Solo

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 way, the levels of the extracted waves match more easily.

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.

- **Off** plays back the waves at their original levels.

- **Wave** normalizes each wave of the wavetable separately.

- **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 separately.

NOTE

The orignial level of the waves in the wavetable is not affected. Only the playback is normalized.

Phase Buttons

The wavetable envelope uses 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 with their original phase.

  Phase cancellation during the crossfades can occur.

- 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 overtones is set to 0 degrees.

  There is no phase cancellation, because all overtones 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 minimize the effects of phase cancellation even more.

NOTE

- This option is only available for **Keep Original Phases** and **Align Phases**.

- This option can introduce pitch modulation.

Fundamental

Displays the frequency of the fundamental of a wave in Hz. This value is set automatically when a wave is extracted from a sample and represents the original pitch.

If you have 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 at 40 Hz, the third at 60, and so on. HALion provides 1024 harmonics, which means that you can create frequencies up to 20.480 Hz.

NOTE

This parameter is only required by the **Formant Shift** function. If the **Formant** section is deactivated in the **Wavetable** section in the **Sound Editor** or the **Zone Editor**, the **Fundamental** parameter has no effect.

Context Menu

Select All
Select None
Select Sequence
Delete
Cut
Copy
Paste
Reverse Order
Init   >
Replace Sample
Load Wavetable
Save Wavetable
Delete Wavetable
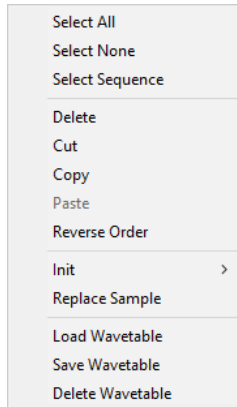
Select All

Selects all waves in the wavetable.

Select None

Deselects all waves in the wavetable.

Select Sequence

Selects all waves from 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 if they have unselected waves in between, only the selected waves change their order, all others remain unaffected.

Init

Allows you to replace a wavetable with a precalculated, mathematically perfect, waveform. You can choose between **Sine**, **Triangle**, **Saw**, **Square**, **Pulse 1**, **Pulse 2**, **White Noise**, and **Pink Noise**. **White Noise** and **Pink Noise** use the spectrum of white and pink noise to fill the wave with random numbers. You get different waves each time that you select **White Noise** or **Pink Noise**.

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.

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 toggle 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**, 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.

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**-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

HALion's **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 only on the selected channel.

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 to the left of the **Sample** display.
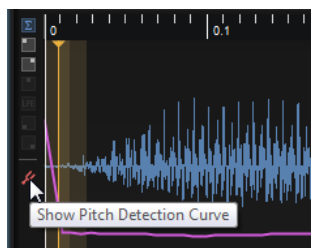
For example, if you use a sample that has a constant pitch but that shows peaks and troughs at some positions in the pitch detection curve, this means that the detection is incorrect at these positions. This is not unusual if you work with complex audio samples. However, if waves are extracted at these positions, the result of the wave extraction will most probably not have the expected result. You can prevent HALion from using incorrectly detected pitches as extraction positions, either by correcting the pitch detection curve or by setting the extraction markers manually.

● To correct the curve, use the **Sensitivity** control on the toolbar. Set it to a value where fewer or no peaks occur in the curve.

NOTE

If the pitch detection fails, that is, if the pitch curve has gaps, a neighboring detected pitch is used. If this is not what you want, you can use a fixed window size.

Markers

Markers in the sample display determine at which position in a sample a wave is extracted.

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 no selection is made, 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**-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**-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 compresses the density of markers on one side and expands it on the other side.

Replacing Samples

To replace a sample, you can do one of the following:

- 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.

NOTE

When you replace a sample, HALion tries to keep the marker positions. However, if the new sample is shorter, the positions of some wave markers can be beyond the sample end. In this case, these markers are set to the sample end.

Importing Wavetables

HALion can import wavetables that were saved as wave files.

If the file header of the wave 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, it can be specified manually. This works differently for waves that contain one single-cycle wave and waves that contain multiple single-cycle waves.

PROCEDURE

1. Load the wave file.

2. On the toolbar, activate **Fixed Size**.

3. Set **Window Size** to the number of samples of the single-cycle wave and **Window Crossfade** to 0 %.

4. If the file contains multiple single cycle waves, set **Marker Creation Mode** to **Equal Distance** and set **Number of Markers** to the number of waves.

   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. To determine the number of waves, divide the length of the sample by the size of the single-cycle waves.

RELATED LINKS
Managing Wavetables on page 169

Managing Wavetables

The **Wavetable Editor** allows you to load, save, and delete wavetables.

The wavetable is always stored with the VST preset. However, you can also save the wavetable to 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.

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.

Grain Oscillator

To show the settings for the granular synthesis, select a granular zone in the **Program Tree** and open the **Zone Editor** or the **Sound Editor** for the zone. For granular zones, the same sections as for sample zones are available, except for the **AudioWarp** section.

The **Load/Replace Sample** button in the header of the grain oscillator allows you to load another sample.

RELATED LINKS
Editing Zones on page 84

Grain Tab

The **Grain** tab of the grain oscillator contains the parameters for the granular synthesis.
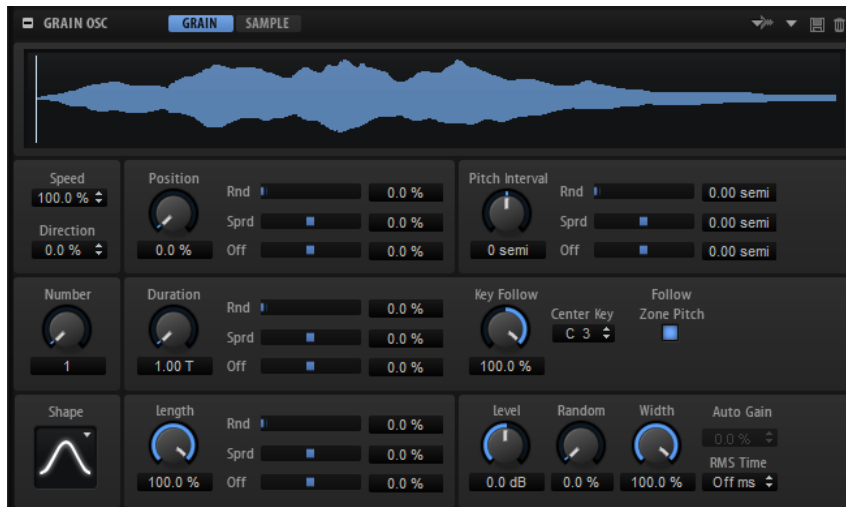
Sample Display

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

> Here, you can specify an interval between -12 and +12 semitones. The grains are played randomly at their original pitch, or they are transposed according to the pitch interval. This interval is calculated separately for each channel of the sample, at the start of a new grain.

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 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 can be used to widen the panorama of 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

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.

Duration Key Follow

Determines how the grain duration changes with the notes that you play. At a setting of +100 % and a **Duration** of 1.00, the grain duration corresponds to the pitch of the played note.

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

Here, you can 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 the longest. With negative values, the first grain has the longest length and the last grain the shortest.

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.

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 widen 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 monophonic. 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 adjusts 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
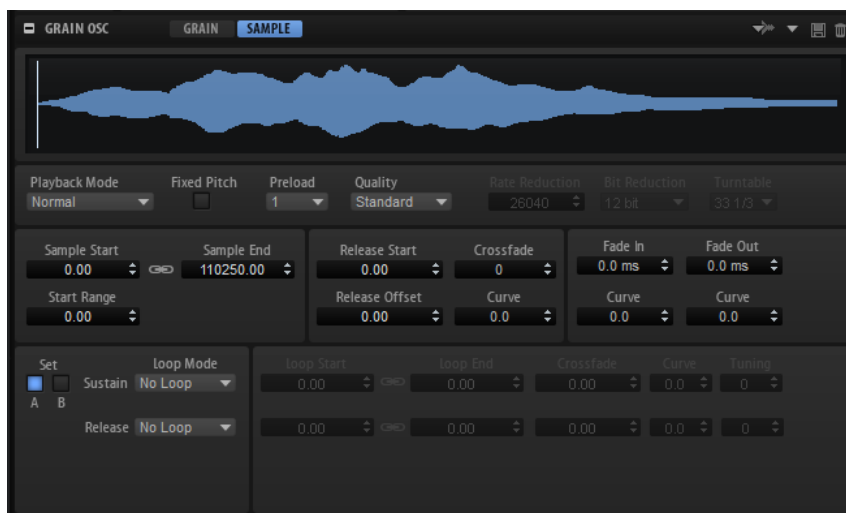
The parameters on the grain oscillator **Sample** tab are the same as in the **Sample Oscillator** section for sample zones.

RELATED LINKS
Sample Oscillator Section on page 96

Modulating the Grain Oscillator

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**.

RELATED LINKS
Modulation Matrix on page 124

MIDI Editing and Controllers

MIDI Editor

The **MIDI Editor** provides access to the MIDI slot parameters. Furthermore, you can specify MIDI controllers to be filtered.
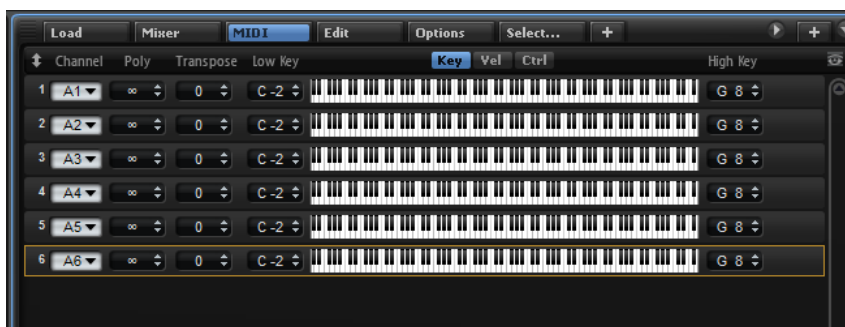
MIDI Editor Parameters

Channel

The slot receives MIDI signals on the MIDI port and channel that are specified here. 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 ±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.

KEY VEL CTRL

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.

KEY VEL CTRL

- 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, for example, 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 and 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 are controllable 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

To assign a MIDI controller to a parameter, proceed as follows:

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 several times to different parameters. However, you cannot assign different MIDI controllers to the same parameter.

RELATED LINKS
MIDI Controller Section on page 37

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 for 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 default.

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 Ctrl Editor

In the **MIDI Ctrl Editor**, all assigned MIDI controllers are shown.
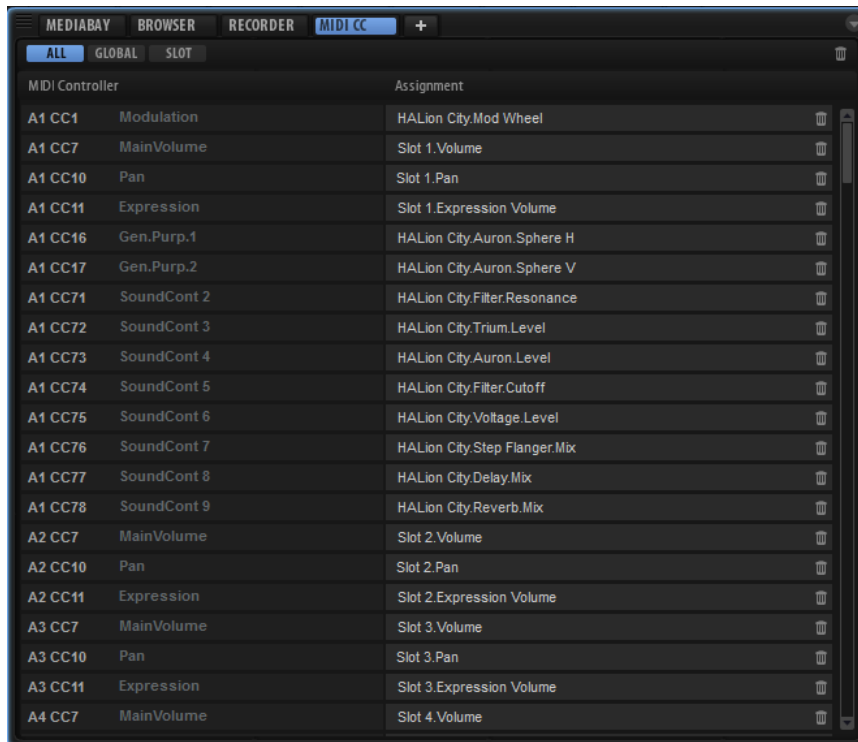
With the buttons at the top, you can specify whether you want to show the MIDI controllers that are assigned to the slot, to global parameters, or whether you want to show them all.

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 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 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.

Parameter	Controller Number	Name
Volume	#7	Volume
Pan	#10	Pan
Send FX 1	#91	Effect 1 Depth
Send FX 2	#92	Effect 2 Depth

Parameter	Controller Number	Name
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 remotely control any other parameter by assigning the parameter first 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 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 4 AUX busses, and a dynamic number of program and layer busses depending on the current program architecture.

Each bus can be controlled using a dedicated mixer channel, featuring functions like level, pan, mute, solo, and up to eight insert/send effects. You can specify which type of bus you want to see at a given time by using the controls on the toolbar.

Toolbar

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.

Hide Inactive Outputs

If the **Show Output Bus Channels** button is activated, the **Mixer** shows all output busses. Deactivated outputs are grayed out. To gain a better overview about which channels are used, activate the **Hide Inactive Outputs** button.

Show Empty Slots

If the **Show Slot Bus Channels** button is activated, the **Mixer** only shows channels that are in use by programs loaded into the corresponding slots. To show the empty slot channels as well, activate the **Show Empty Slots** button.

Collapse All Mixer Channels/Expand All Mixer Channels

- To expand all mixer channels, click the **Expand All Mixer Channels** button. Expanded mixer channels provide direct access to the insert/send effects.

- To collapse all mixer channels, click the **Collapse All Mixer Channels** button. Collapsed mixer channels only show the most important controls, that is, level, pan, solo, mute, and a level meter.

Channel Strip Controls

Mute

Mutes the bus.

Solo

Mutes all other busses and lets you hear the solo bus only. You can put several channels into solo mode to hear all of them.

Level

The level fader allows you to adjust the volume of the bus. All busses allow 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 to 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 various 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 on 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 routed automatically 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 on that bus. Depending on how you set up the audio busses, you can load insert effects on 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 via sends to an AUX bus. 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 on the AUX bus.

AUX Busses

You need an AUX bus to route individual audio signals from zones or audio busses to AUX effects. HALion provides 4 global AUX busses and 4 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 sends for each zone and audio bus separately.

Master Effect Bus

The master bus works similar 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).

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.

Zones

The outputs of zones are routed to the first audio bus of the next higher layer or the program. You can reassign the outputs of the zones 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.

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.

Slots

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.

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 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

PROCEDURE

1. Select a zone in the **Program Tree**.
2. Open the **Sound Editor**, show the **Amplifier** section and open the **AUX** tab.
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 correctly 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 have the wrong width and that you risk losing signals from audio channels that cannot be processed.

In this case, you could 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 4 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.

Adding and Removing Local AUX Busses

- 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 will still be 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 8 insert effects. To display the inserts, you must expand the channel strips.
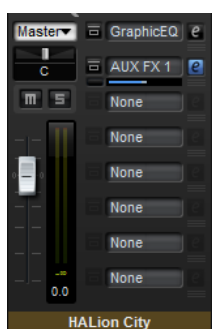
Each insert can either be a classical insert effect like a chorus or a delay, or it can load one of the 4 AUX send effects that allow you to send the signal to the AUX busses. All slot, program, and layer busses, as well as zones, can send signal portions to these busses. If an AUX send effect is loaded, a level fader is available for the insert slot. 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.
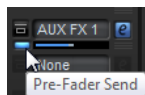
Using the Insert Effect Slots

In the **Mixer**, you can set up insert effects for AUX busses.

Each bus provides eight slots for insert effects.

- 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 an AUX bus, select a different output from the 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 them by their drag icon to a new position between two slots.

- To copy an effect into another slot, **Alt**-click its drag icon and drag it onto the new slot. This replaces any effect loaded in this slot.

  NOTE

  You can also copy effects between the different mixers. First drag an effect to the corresponding mixer tab. Then drag it to the position where you want to insert it.

- To copy an effect and insert it between two effect slots, **Alt**-click its drag icon and drag it between two slots.

  NOTE

  You can also copy effects between the different mixers. First drag an effect to the corresponding mixer tab. Then drag it to the position where you want to insert it.

Loading and Managing Programs via the Program Table
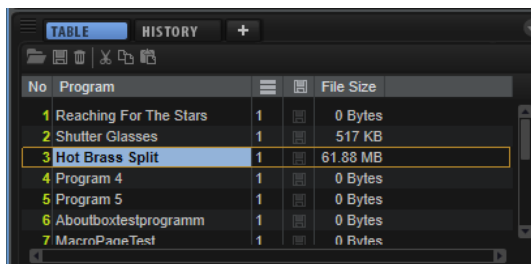
HALion allows you to load a virtually unlimited number of programs into the **Program Table**. This is useful, because it allows for quick access to these programs and for preloading the program samples for faster changes between programs.

> **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.

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

Shows 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**.

PROCEDURE

- Do one of the following:

  - Drag the program from the **MediaBay** to a slot in the **Program Table**.

    NOTE

    If you drag multiple programs on 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 63

Configuring the Program Table

You can configure the **Program Table** by showing/hiding and rearranging the columns.

You can reorder columns using drag and drop and change the width of a column by dragging its borders.

You can show/hide the **File Size**, **Preload**, and **Used** columns.

- To hide a column, right-click the column header and use the corresponding **Remove** command.

- To insert a column, select its name on the column header context menu.

NOTE

All modifications to the columns are saved with the project.

Program Table Context Menu
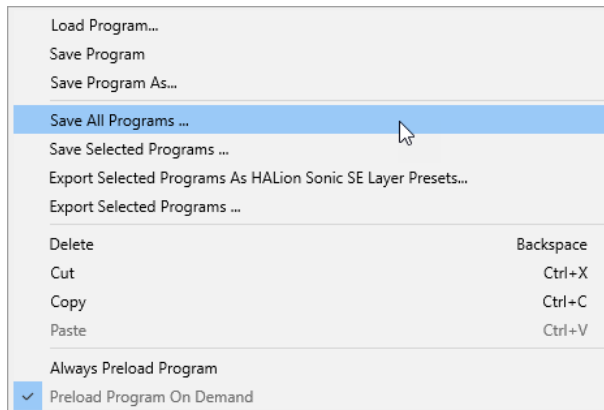
Load Program

Allows you to load a program.

Save Program

Saves the current program.

Save Program As

Allows you to save a program under a new name and in a different subfolder in the content folder.

Save All Programs

Saves all programs in the **Program Table**.

Save Selected Programs

Saves the selected programs.

Export Selected Programs As HALion Sonic SE Layer Presets

Allows you to add attributes to the selected programs and export them as HALion Sonic SE Layer Presets.

Export Selected Programs

Allows you to export multiple programs without changing their format. This means that HALion Sonic programs are saved as HALion Sonic programs, HALion Sonic SE programs as HALion Sonic SE programs, etc. This can be useful if you created a large number of presets for HALion Sonic SE and you realize that you have to make late modifications to all of them in HALion, either manually or by using a script, for example. Once all programs are modified, you can export them while keeping them compatible with the program version they were created for.

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 it is
loaded into a slot.

RELATED LINKS
Exporting Programs and Layers as HALion Sonic SE Layer Presets on page 223

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 elements that make up 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 one go. 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 in 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.

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 when you are editing or deleting zones.
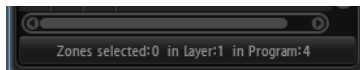
EXAMPLE

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 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.

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 under a new name.

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 that you want to add to the program.

Create New Audio Effect

Opens a selector where you can choose an audio effect that you want to add 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.

Deactivate HALion Sonic Edit Mode

This button is available if you load a preset that was created in HALion Sonic or HALion Sonic SE 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 or HALion Sonic SE any longer.

Selection Filter

Allows you to select a group of elements by double-clicking on a program, layer, or zone. By default, a double-click selects all elements in the **Program Tree**.

The selection filter can be set to select only zones, layers, effects, MIDI modules, or busses.

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 **Program Tree** by clicking the eye icon 👁 in the **Visibility** column. 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**-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 34

Configuring the Columns

- 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.
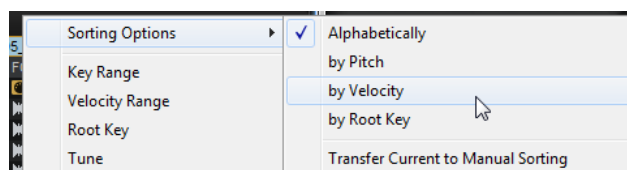
- To change the sorting, right click a column header to open the context menu, and select an option from the **Sorting Options** submenu.

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 available options and commands depend on the element for which you open the menu. 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
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, select **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, select **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. Which options are available depends 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 current program at the current hierarchy position.

- **Save Program** saves the current program.

  > NOTE
  >
  > The 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.

- **Save Program/Layer As** allows you to save the current program or layer to your user content folder.

- **Save Layer As Program** allows you to save the selected layer in the **Program Tree** as program to your user content folder.

- **Revert to Last Saved Program** discards all the 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.

- **Export Program/Layer as HALion Sonic SE Layer Preset** allows you to set up attributes for the selected program or layer and export it as HALion Sonic SE layer preset. These presets can then be loaded by HALion Sonic or HALion Sonic SE as layers or as programs.

- **Export Program as Protected VST 3 Preset/Export Layer as Protected VST 3 Preset** allow you to set up attributes for the selected program or layer and export it as a protected VST 3 preset.

- **Export Program as VST 3 Preset with Files/Export Layer as VST 3 Preset with Files** allow you to set up attributes for the selected program or layer and export it, including all its files, as a VST 3 preset.

- **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 if you processed some samples and saved 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 in the **Program Tree**.

If a sample is selected, 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**.

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 toggle 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 all 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. Then, the remaining gaps on the velocity axis are filled.
- **Velocity and Pitch** first fills the gaps on the velocity axis. Then, 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, 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 and 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 as the other MIDI modules in HALion, that is, they appear on 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 224
Mapping Editor on page 65
Search and Rename Dialog on page 229

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.

Program Tree Columns and Controls

Toolbar

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 under a new name.

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 that you want to add to the program.

Create New Audio Effect

Opens a selector where you can choose an audio effect that you want to add 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.

Deactivate HALion Sonic Edit Mode

This button is available if you load a preset that was created in HALion Sonic or HALion Sonic SE 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 or HALion Sonic SE any longer.

Selection Filter

Allows you to select a group of elements by double-clicking on a program, layer, or zone. By default, a double-click selects all elements in the **Program Tree**.

The selection filter can be set to select only zones, layers, effects, MIDI modules, or busses.

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 **Program Tree** by clicking the eye icon in the **Visibility** column. 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**-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

Editing Programs, Zones and Layers

Creating Zones

To create a new zone, you have the following options:

- Drag and drop samples from the **MediaBay** or the File Explorer/macOS Finder to a program or layer.

- 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.

Creating Layers

To create new layers you have the following options:

- 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.

Saving Programs and Layers as VST Presets

PROCEDURE

1. To save a program as VST preset, click the **Save** button on the toolbar, or use the **Save Program** command on the **Load/Save** submenu of the context menu. To save a specific layer, right-click it and select **Load/Save** > **Save Layer As**. In the dialog, specify a name and click **OK**.

2. In the dialog, specify a location on the left, and modify or add attributes on the right.
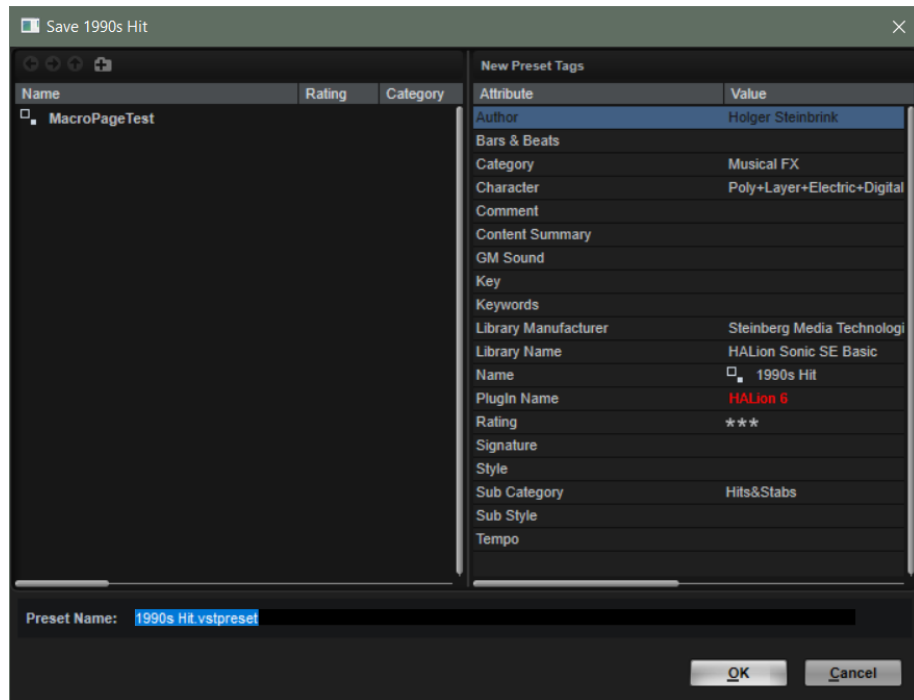
3. Click **OK** to save the program/layer and close the dialog.

NOTE

Programs and layers are always saved as `.vstpreset` files.

Importing Samples

You can manually select samples to import or you can import complete folders containing samples.

- 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**.

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.

RELATED LINKS

Import Samples Dialog

- To open the **Import Samples** dialog, right-click a program or layer in the **Program Tree** and select **Import/Export** > **Import Samples**.
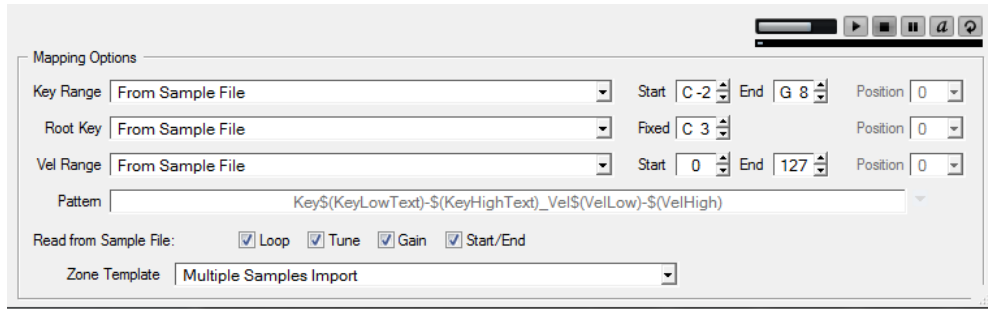
In the **Mapping Options** section, you can specify how to map the samples and you can extract mapping information from sample file and folder names.

- To listen to the samples before importing them, use the transport controls in the upper right of the **Mapping Options** section.

Level

Adjusts the playback level.

Play

Plays back the focused file.

Stop

Stops playback. The play locator 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.

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 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.
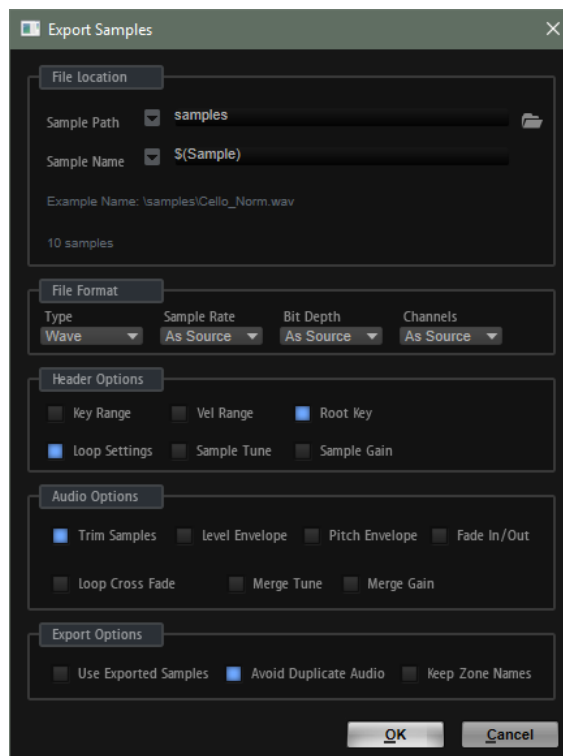
File Location

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.
- **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 215

Export Preset with Samples Dialog
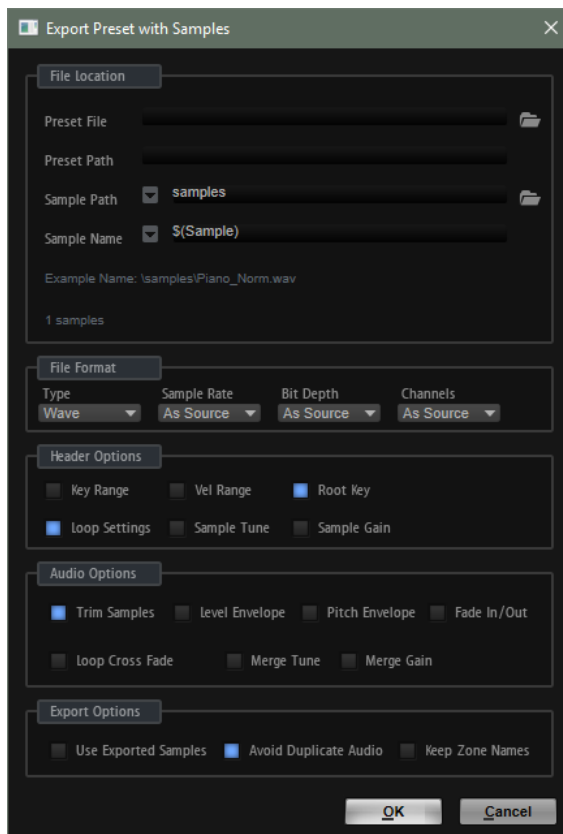
File Location

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.
- **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 215

Exporting Programs and Layers as HALion Sonic SE Layer Presets

By exporting programs or layers as HALion Sonic SE Layer presets, you can make sure that they can be loaded correctly by HALion Sonic or HALion Sonic SE. This is particularly useful if you create content that will be part of a VST Sound container, because it lets you verify whether the preset contains all necessary resources.

PREREQUISITE

HALion Sonic layers require a macro page to be controllable from within HALion Sonic. Without 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 or HALion Sonic SE.

PROCEDURE

1. Right-click the program or layer and select **Import/Export** > **Export Program as HALion Sonic SE Layer Preset/Export Layer as HALion Sonic SE Layer Preset**.

2. Specify a file name and a location for the preset.

3. Optional: In the right section of the dialog, set up the attributes for the preset.

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 together with its files to a new directory. This is useful if you want 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 with Files** or **Export Layer as VST 3 Preset with Files**.

2. In the dialog, enter the name of the instrument that you are creating as the file name and specify a location for the exported files.

3. Click **OK** to start the export.

RESULT

HALion creates a VST 3 preset and several folders in the specified directory. These folders contain all the resources that are used 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, please consult the section **Guidelines** > **Using Relative Paths** at http://developer.steinberg.help.

AFTER COMPLETING THIS TASK

If you want to use the exported preset, be sure to load it.

Importing Sliced Loops

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.

PROCEDURE

● Do one of the following:

    ● 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.

Playing Back Sliced Loops

You can play back the 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

If this option is activated, the phrase plays 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 repeats 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. This way, the phrase gets 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

Navigating in the Program Tree

If the **Program Tree** has the window focus, you can use the arrow keys for navigating between the elements.

● 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.

RELATED LINKS
Locking Windows on page 11

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 an element, click it a second time, and enter a new name.

- Select an 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**.
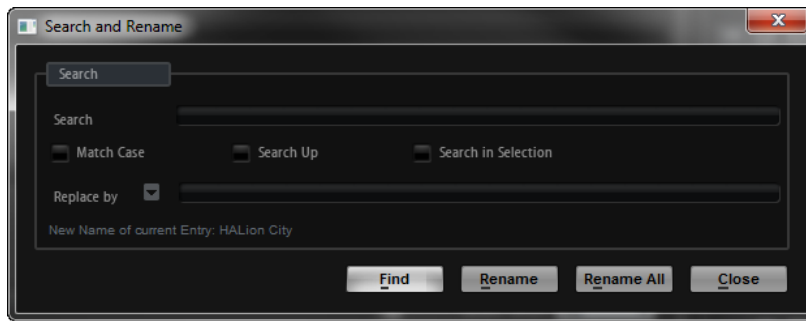
Text Field for the Search

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.

- 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.

- 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.

- To expand a folder and view its content, click the plus sign or double-click the folder. To collapse a folder, click the minus sign or double-click the folder.

Toolbar

Expand All Nodes/Collapse All Nodes

Expands/Collapses all folders in the list.

Show Only Connected Parameters

To display only connected parameters in the list, activate **Show Only Connected Parameters** ◨ in the top right corner of the **Parameter List**.

Follow "Switch off All Insert Effects"

This button 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 the user should not recognize as an effect. 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"

This button 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 the user should not recognize as an effect.

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.

Columns

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.

ID (Dec)

Shows the parameter ID as decimal value.

ID (Hex)

Shows the parameter ID as 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, spl (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.
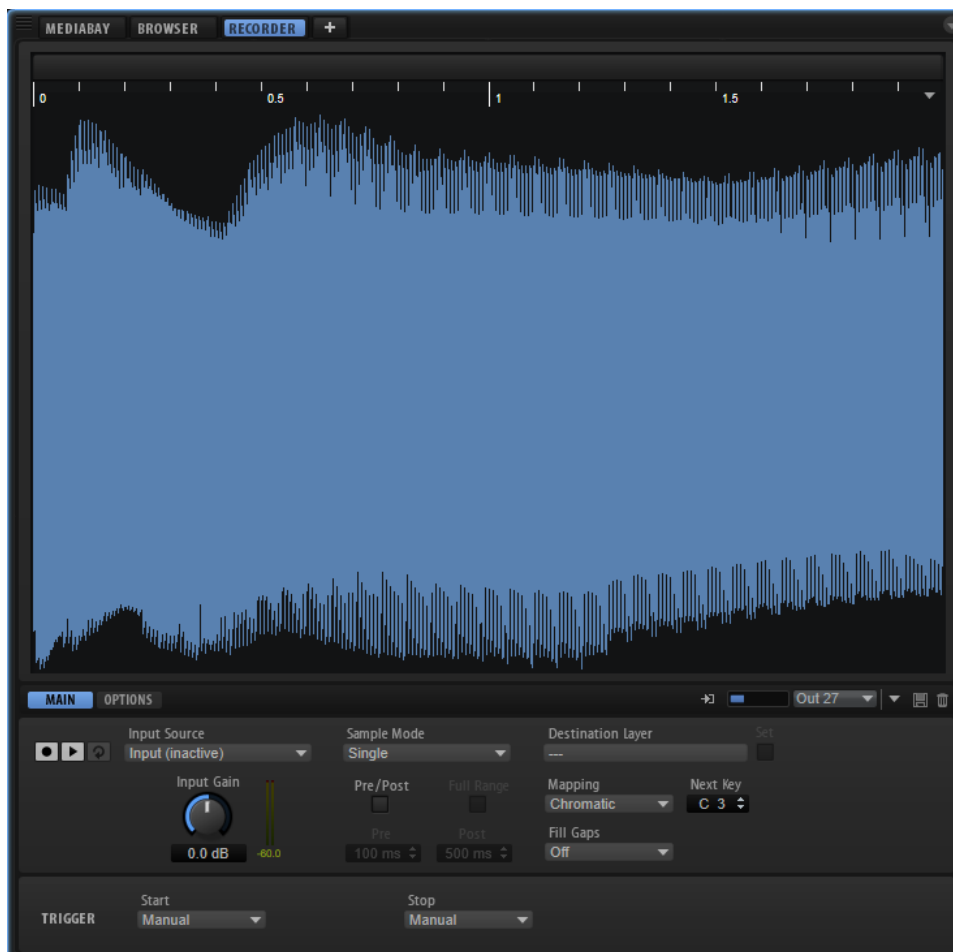
The upper part of the **Sample Recorder** contains the waveform display.

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
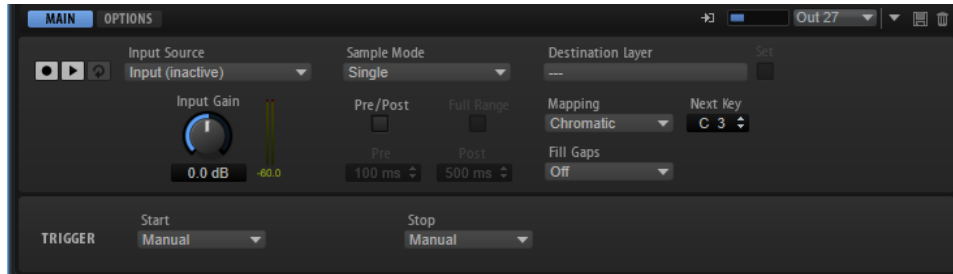
Record/Record Enable

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.
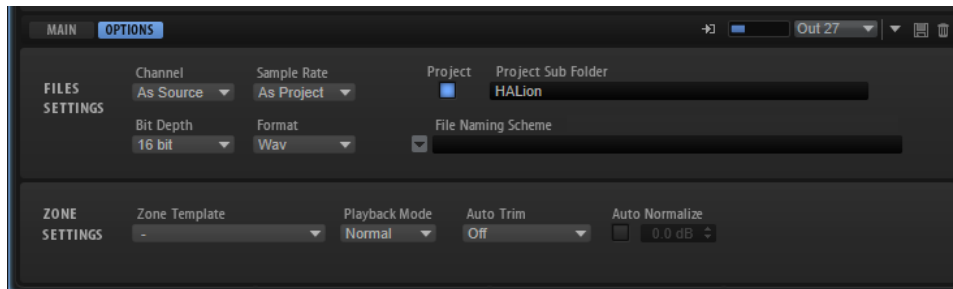
File Settings

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.

RELATED LINKS

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.

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.

Selecting Samples

You can select samples on the sample selector that is opened by clicking the little triangle in the upper left of the page.

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 gets the pitch of the frequency at which the grains repeat. For grains longer than 30 ms, the sound gets 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 monophonic.

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 source.

Grains

Allows you to specify the number of grains, from 1 to 8. For example, with a setting of 4, you get 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 mod wheel, or vibrato, settings in the lower section.

LFO Settings

LFO Waveform and Shape

- **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 produced.

- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned 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.

Mod 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 mod wheel on the grain position.

Formant

> Controls the influence of the mod wheel on the grain formant.

Duration

> Controls the influence of the mod wheel on the grain duration.

Cutoff

> Controls the influence of the mod 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 for 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** are 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

Filter Shape

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.
- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.
- HP 6+LP 18 and HP 6+LP 12 are combinations 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.
- HP 12+LP 6 and HP 18+LP 6 are combinations 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.
- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.
- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.
- BR 12+LP 6 and BR 12+LP 12 are combinations 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.
- BP 12+BR 12 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.
- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.
- HP 6+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 notes 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

Click the variation buttons 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 work only 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 Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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 that is used 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

   - To start from scratch, load a phrase and edit the settings.

   - To use an existing variation as 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.
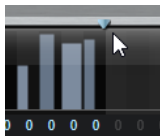
- To set up the phrase, activate the **Vel** button above the step display.
- To set up a controller curve for the phrase, activate one of the controller buttons.

- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.
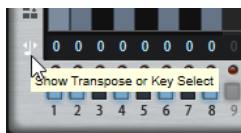

Editing Steps

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** and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift-Alt** 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 **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.
- To transpose a step, click in the field below it and enter the number of semitones for the transposition.
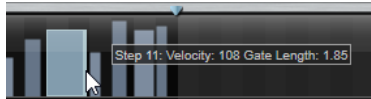
  NOTE

  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 the following step, this following 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 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 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, where each is 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 as slave or master. 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 a master oscillator is modulating the pitch of a slave oscillator at the rate of the audio sample. The **Waveform** parameter adjusts the pitch ratio between slave and master oscillator, resulting in a sound close to 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 close to 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

The wave shape of the sub oscillator. You can choose between **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, and **Pulse Narrow**.

Level

Adjusts the output level of the sub oscillator.

Ring Modulator

Ring modulation produces 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 for 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** are 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 mod wheel, or vibrato, settings in the lower section.
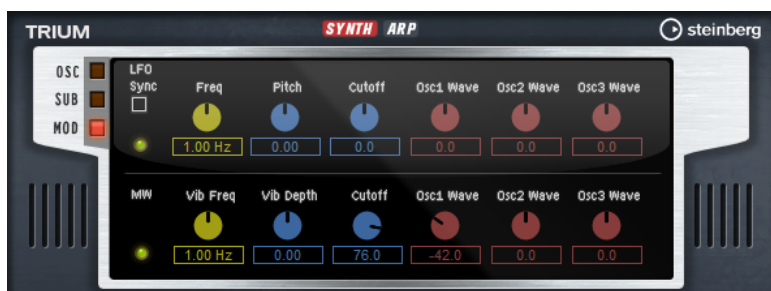
LFO Settings

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.

Mod 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 mod wheel on the filter cutoff.

Osc1/2/3 Wave

These parameters control the influence of the mod 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

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

- HP 6+LP 18 and HP 6+LP 12 are combinations 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.

- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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 notes 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

Click the variation buttons 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 work only 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 Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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 that is used 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

   - To start from scratch, load a phrase and edit the settings.

   - To use an existing variation as 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.
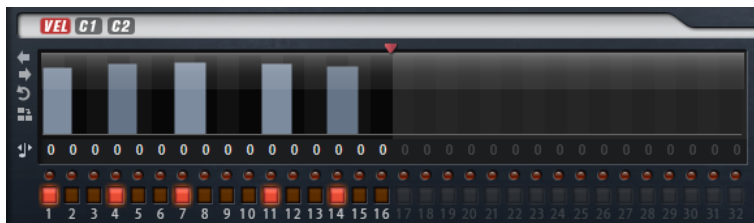
User Phrases

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.

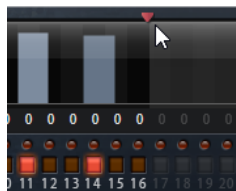To create your own phrases, activate the **User** button.

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.
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- To specify the number of steps for the pattern, drag the **Pattern Length** handle to the right or left.
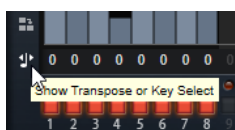

Editing Steps

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** and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift-Alt** 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 **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.
- To transpose a step, click in the field below it and enter the number of semitones for the transposition.
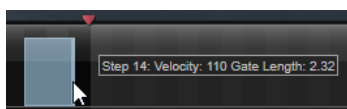
  NOTE

  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 the following step, this following 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 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.

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 notes are played with the same level.

Voice Section

Octave

Adjusts the pitch in octave steps.

Pitchbend Up/Pitchbend Down

Determines the range for 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** are 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.

Mod Wheel Section

Vib Freq

Controls the frequency of the second LFO that is used for pitch modulation (vibrato).

Cutoff

Controls the influence of the mod wheel on the filter cutoff.

Vib Depth

Controls the depth of the pitch modulation (vibrato).

Distortion

Controls the influence of the mod 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

Click the variation buttons 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 work only 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 Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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 that is used 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

    - To start from scratch, load a phrase and edit the settings.

    - To use an existing variation as 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.
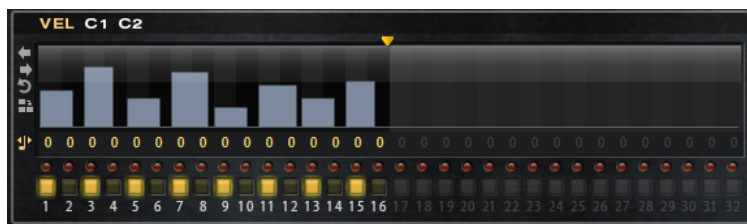
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To create your own phrases, activate the **User** button.

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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.

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The height of a step represents its value. You can edit the steps in the following way:

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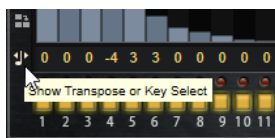- To draw a ramp with steps, hold down **Alt** and draw a line.
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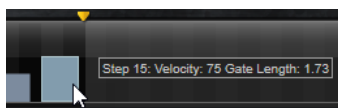
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- To shift the rhythm of the phrase, click **Shift Phrase Right** or **Shift Phrase Left** .

  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 the Steal 1' option.

● **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** dial on the **Organ** page.

The Rotary effect on this page has the same parameters as the included Rotary effect, except for **Input** and **Color**.

RELATED LINKS
Rotary on page 468

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** dial on the **Organ** page.

The parameters correspond to those of the VST Amp effect, with reduced microphone and microphone position options.

RELATED LINKS
VST Amp on page 459

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 like a ping-pong ball between left and right in the stereo panorama.

Delay 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. At a setting of 0 %, you hear only one echo. At a setting of 100 %, the echoes repeat endlessly.

Mix

> Sets the ratio between the dry and the wet signal.

Reverb

On/Off

> Activates/Deactivates the Reverb effect.

Reverb Type

Use this dial 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 dial position. Use the dial 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 for 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 inside HALion. 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.
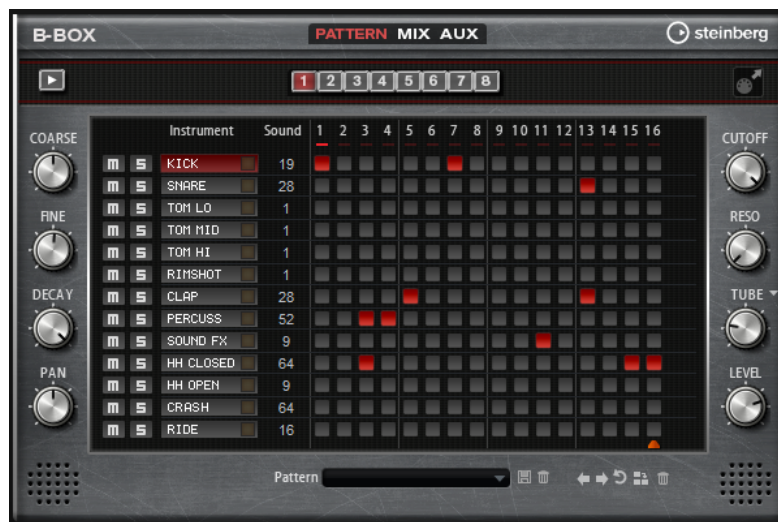
The pattern editor section in the center of the window allows you to create and edit drum patterns.

- 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.
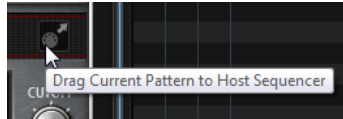
Variations

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.

RELATED LINKS

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.
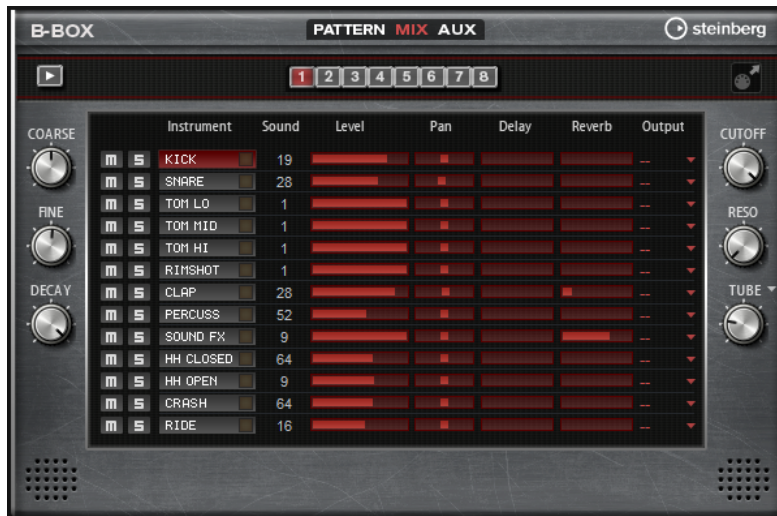
Level

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 repeats 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 HALion 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
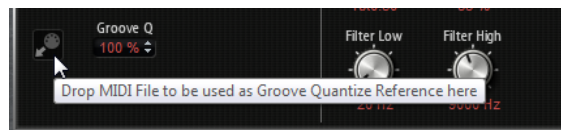
To adapt the timing of a pattern to an external MIDI file, you can drop this MIDI file on the **Groove Quantize** drop field. You can quantize the playback of the pattern to the timing of a sliced loop by dragging its MIDI file from the MIDI export drag field to the **Groove Quantize** drop field.

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.

Delay and Reverb Section

The delay and reverb effect have the same parameters as the Multi Delay and Reverb effects.

Delay

Adjusts the general amount of delay.

Reverb

Adjusts the general amount of reverb.

Master

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

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

- HP 6+LP 18 and HP 6+LP 12 are combinations 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.

- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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 notes 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 for 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 mod 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

Click the variation buttons 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 work only 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 Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.
- 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 that is used 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.
2. You can either start from scratch or base the new variation on an existing variation.
   - To start from scratch, load a phrase and edit the settings.
   - To use an existing variation as 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.
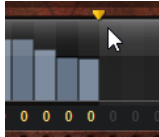- To draw a ramp with steps, hold down **Alt** and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift**-**Alt** and draw a line.
- To reset the velocity of a step to 127, **Ctrl/Cmd**-click the step.
- To reset the velocity of all steps to 127, hold **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.

- To transpose a step, click in the field below it 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 the following step, this following step is deactivated.

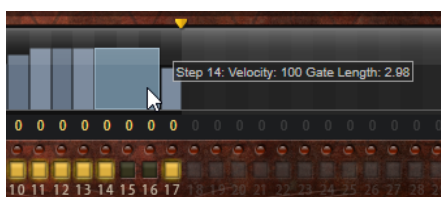- To reset the length of a step to 1, **Ctrl/Cmd**-click its highlighted right border.

- 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 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

Click the variation buttons 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

If this option is activated, the phrase plays 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 repeats 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. This way, the phrase gets 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 notes are played with the same level.

Decay

> Controls the decay time of the amplifier envelope.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

   ● To start from scratch, load a phrase and edit the settings.

   ● To use an existing variation as 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 wavteable 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 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 following notes start from the current playback position for as long as the first note is held.

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 where the envelope 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 25.0 % and 75.0 %, set **Position** to 25.0 % and **Random Position** to 50.0 %.

Random Direction

Adds a negative or positive random 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 %, for example.

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 kept the same for all notes.

You can invert the behavior of the formant shift by setting **Key Follow** to negative values.

Multi Tab
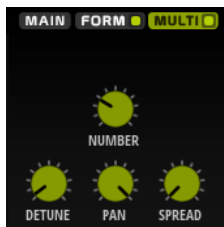
The multi-oscillator function allows you to trigger multiple voices simultaneously with each note that you play. If you activate **Multi**, the following parameters become available:

- **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

The wave shape of the sub oscillator. You can choose between **Sine**, **Triangle**, **Saw**, **Square**, **Pulse Wide**, and **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 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.

WT 1/2 Pitch

Modulates the **Pitch** parameter of the corresponding wavetable oscillator.

WT 1/2 Level

Modulates the **Level** parameter of the corresponding wavetable oscillator.

WT 1/2 Pan

Modulates the **Pan** parameter of the corresponding wavetable oscillator.

WT 1/2 Multi Detune

Modulates the multi-oscillator **Detune** parameter of the corresponding wavetable oscillator.

WT 1/2 Multi Pan

Modulates the multi-oscillator **Pan** parameter of the corresponding wavetable oscillator.

WT 1/2 Multi Spread

Modulates the multi-oscillator **Spread** parameter of the corresponding wavetable oscillator.

WT 1/2 Multi Voices

Modulates the multi-oscillator **Voices** parameter of the corresponding oscillator.

WT 1/2 Position

Modulates the **Position** parameter of the corresponding wavetable oscillator.

WT 1/2 Direction

Modulates the **Direction** parameter of the corresponding wavetable oscillator.

WT 1/2 Speed

Modulates the **Speed** parameter of the corresponding wavetable oscillator.

WT 1/2 Formant Shift

Modulates the **Formant Shift** parameter of the corresponding wavetable oscillator.

WT Sub Pitch

Modulates the **Pitch** parameter of the wavetable sub oscillator.

WT Sub Level

Modulates the **Level** parameter of the wavetable sub oscillator.

WT Sub Pan

Modulates the **Pan** parameter of the wavetable sub oscillator.

WT Noise Speed

Modulates the **Speed** parameter of the wavetable noise oscillator.

WT Noise Level

Modulates the **Level** parameter of the wavetable noise oscillator.

WT 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 by MIDI note number. Set this parameter to positive values in order to raise the pitch the higher you play. Use negative values to lower the pitch the higher you play. 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 for 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

● LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

● BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

● HP 6+LP 18 and HP 6+LP 12 are combinations 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.

● HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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 notes 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 Waveform and Shape

- **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 produced.
- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned 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

Click the variation buttons to switch between the available variations.

Phrase

Allows you to select a phrase.

Drag Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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 arpeggiator, even if no new notes or chords were triggered.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.

- **Arp** replaces the missing keys with the note that the arpeggio would normally play.

- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

   - To start from scratch, load a phrase and edit the settings.

   - To use an existing variation as 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.
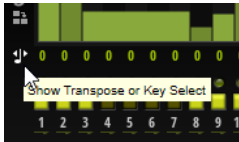

Editing Steps

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** and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift**-**Alt** 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 **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.
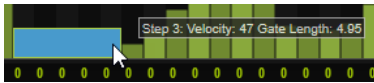- To transpose a step, click in the field below it and enter the number of semitones for the transposition.

  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 the following step, this following 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 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 gets the pitch of the frequency at which the grains repeat. For grains longer than 30 ms, the sound gets 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 monophonic.

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 source.

Grains

Allows you to specify the number of grains, from 1 to 8. For example, with a setting of 4, you get 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
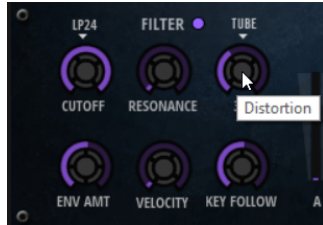
> Adjusts the pitch in semitone steps.

Fine

> Adjusts the pitch in cent steps. This allows you to fine-tune the oscillator sound.

Pitchbend Up/Pitchbend Down

Determines the range for the modulation that is applied when you move the pitchbend wheel.

Filter Section

Filter On/Off

Activates/Deactivates the filter.

Filter Shape

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

- HP 6+LP 18 and HP 6+LP 12 are combinations 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.

- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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 notes 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 Waveform and Shape

- **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 produced.
- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned 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

Click the variation buttons to switch between the available variations.

Phrase

Allows you to select a phrase.

Drag Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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 arpeggiator, even if no new notes or chords were triggered.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.

- **Arp** replaces the missing keys with the note that the arpeggio would normally play.

- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

   - To start from scratch, load a phrase and edit the settings.

   - To use an existing variation as 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.
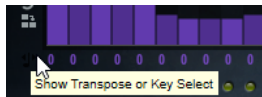

Editing Steps

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** and draw a line.

- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift-Alt** 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 **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.

- To transpose a step, click in the field below it 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 the following step, this following 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 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 dial 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 dial 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

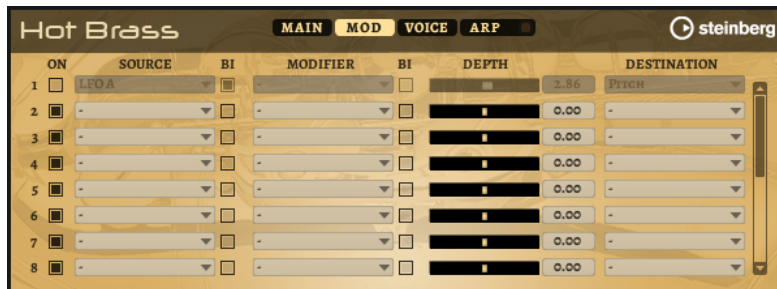Allows you to fine-tune the pitch in cent steps.

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 for the modulation that is applied when you move the pitchbend wheel.

Filter Section

Filter On/Off

Activates/Deactivates the filter.

Filter Shape

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

- HP 6+LP 18 and HP 6+LP 12 are combinations 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.

- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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 notes 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 Waveform and Shape

- **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 produced.
- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned 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

Click the variation buttons to switch between the available variations.

Phrase

Allows you to select a phrase.

Drag Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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 arpeggiator, even if no new notes or chords were triggered.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

    - To start from scratch, load a phrase and edit the settings.

    - To use an existing variation as 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.
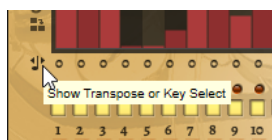

Editing Steps

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** and draw a line.
- To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift-Alt** 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 **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.
- To transpose a step, click in the field below it 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 the following step, this following 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 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.
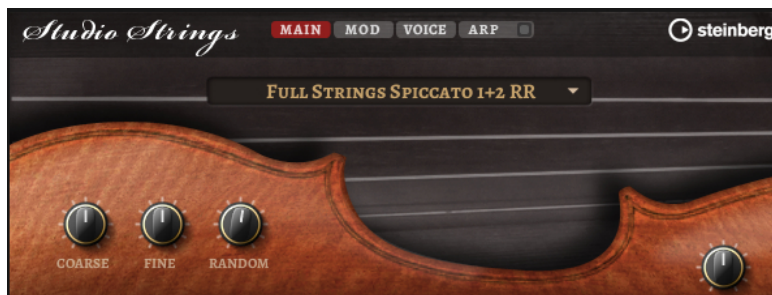
Select Samples

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 for the modulation that is applied when you move the pitchbend wheel.

Filter Section

Filter On/Off

Activates/Deactivates the filter.

Filter Shape

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

- HP 6+LP 18 and HP 6+LP 12 are combinations 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.

- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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 notes 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

Click the variation buttons to switch between the available variations.

Phrase

Allows you to select a phrase.

Drag Recorded MIDI to 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

If this option is activated, the phrase plays 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 repeats 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 at which moment 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 in reaction to your playing on each new beat.

- If **Next Measure** is selected, the arpeggiator 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 arpeggiator, even if no new notes or chords were triggered.

Key Mode

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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. This way, the phrase gets 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 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

Determines how the notes are played back.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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**, 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.

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 blinking 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 on a MIDI track in your host sequencer application.

Creating Variations

PROCEDURE

1. Click one of the variation buttons.

2. You can either start from scratch or base the new variation on an existing variation.

   - To start from scratch, load a phrase and edit the settings.

   - To use an existing variation as 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 and draw a line.

● To draw symmetric ramps at the beginning and the end of the sequence, hold down Shift-Alt 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 **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.
- To transpose a step, click in the field below it and enter the number of semitones for the transposition.
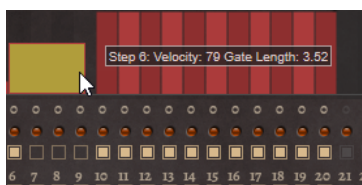
  NOTE

  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 the following step, this following 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 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.

Macro Pages

HALion allows you to build your own sample and synthesizer instruments and to customize them using the integrated Lua script engine. In 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 http://developer.steinberg.help.

Macro Pages, Templates, Controls, Resources, and Libraries

The general concept behind 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) and a list of templates that are referenced on it.

Templates

A template is a group of control elements. A template can be used multiple times on a macro page, 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, it is best to try it out step by step and get familiar with the system.

Once you get the general idea of how macro pages are created, take a look at the instruments that come with HALion, such as Anima, Skylab, etc. All the new 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 New 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 and HALion Sonic SE.

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 and HALion Sonic SE automatically adapt their size to the size of the macro page.

Adding a Background Image to a Macro Page

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 background.

PROCEDURE

1. In the File Explorer/macOS Finder or the **Resource/Library Browser**, navigate to the `.bmp` or `.png` bitmap file that you want to use and drag it onto the canvas in 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 directly on the canvas.

RELATED LINKS

Editing the Elements on the Canvas on page 411
Scaling Elements on page 414

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 the 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.
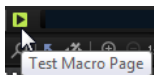
    In the **Parameter List** and/or the **Amp** section of the **Zone Editor**, you can see that the parameter values change as you use the control.

# Defining the Appearance of the Macro Page in the Player View

The plug-in window of HALion Sonic and HALion Sonic SE 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.
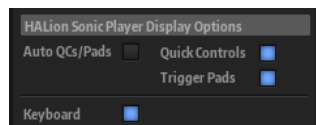
    - If **Auto QCs/Pads** is activated, the quick controls and trigger pads sections are shown in the player view for presets that use quick controls and/or trigger pads.

        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 or HALion Sonic SE 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 and HALion Sonic SE.

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 necessary 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 displayed in their entirety 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 size standard used in HALion Sonic and HALion Sonic SE, 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 size standard 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, complete with all the 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 in 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. If you want to use the exported macro page instead, you must load it using 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 changes made afterwards are discarded.

Cut

Cuts the selected element.

Copy

Copies the selected element to the clipboard.

Paste

Pastes the element from the clipboard at the current position.

NOTE

You can copy and paste elements between macro pages. All related resources are automatically copied as well.

Create New Element

Click this button to add a new element.
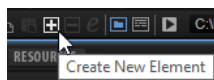
Which elements can be added depends on whether you are in the **GUI Tree**, the **Templates Tree**, or the **Resources Tree**.

Delete Element

Click this button to delete the selected element.

Edit Element

Click this button to edit the selected element.

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 use the macro page controls as you would on the final macro page.

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. This way, 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 and you can make adjustments for it in the **Properties** section.

For a better overview, the different element types use different icons.

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, if you have been editing a template within a template, clicking **Switch Back to Macro Page/Parent Template** switches back to the parent template.

Context Menu
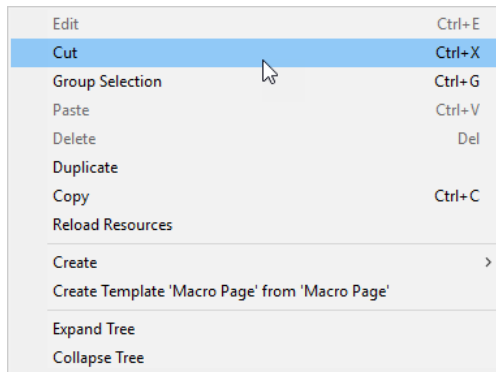
Edit

Allows you to edit the selected element.

Cut

Cuts the selected element.

Group Selection

Allows you to group multiple selected elements.

Paste

Pastes the element from the clipboard at 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 are only visible 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 Template <template name> from <name of group/selection>

Allows you to create a template from the current group or selection.

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.

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
Image
Knob
Label
Menu
Range Slider
Slider
Switch
Text

Disable
Group
Template
Template List
Stack

Drop
Meter
Step Modulator
Waveform
Wavetable
Wavetable 3D
XY
Variables
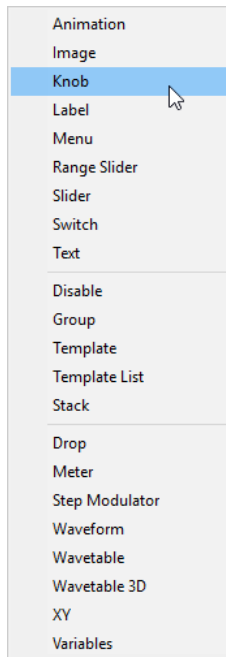
Animation

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.
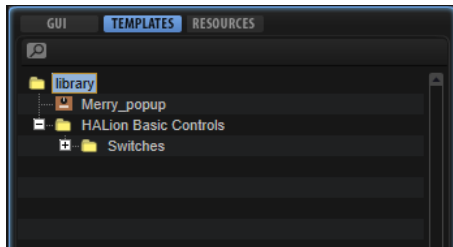
If a template is selected in the **Templates Tree**, the **Preview** section displays the contents of the template.

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.

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, and the canvas displays the content of the template.

2. 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.
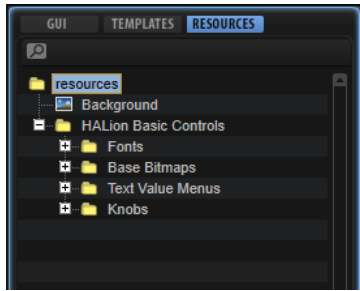
You can add or remove resources in the tree and organize them into folders. This allows you to structure your macro page, in order to keep an overview over your files.

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 424

Resources Tree Elements

In the **Resources Tree**, you can add and edit the resources for your macro pages, that is, bitmaps, sections, and fonts.

NOTE

For names, 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.
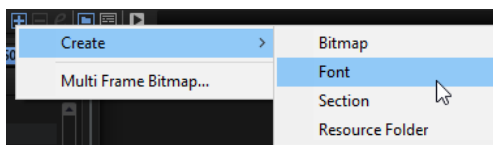
Bitmap

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 a knob animation, for example, the number of frames must be set.

When you add a bitmap, HALion evaluates it to find out if the image is in fact an animation and of how many frames it is composed. The number of frames is then set automatically. However, this analysis cannot always deliver the perfect frame count, and it may be that you must set this value manually.

Bitmap resources also provide an alpha channel that allows you to specify the degree of overall transparency of the bitmap. A fully opaque bitmap is set to 255. A value of 128 results in a semi-transparent background, for example.

With version 6.2 of HALion/version 3.2 of HALion Sonic, macro pages support **High DPI**, that is, the adaption 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" at the end of the file name, for triple-resolution files, add "_3.00x", etc.

HALion and HALion Sonic display the bitmap that best matches the scaling factor set in the operating system. For example, if the display scaling is set to 200 % on a Windows system, HALion will use the "_2.00x" bitmaps for the macro page. When you create VST Sound containers, the **Library Creator** automatically includes all additional high-resolution bitmaps.

Font

Allows you to create a font for use in your macro page elements. You can make settings for it in the **Properties** section.

NOTE

Make sure that you only use free fonts or fonts that you are allowed to use because you purchased the license.

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.

Resource Folder

You can add folders to the **Resources Tree** to help you structure your macro page and keep an overview over the resources.

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.
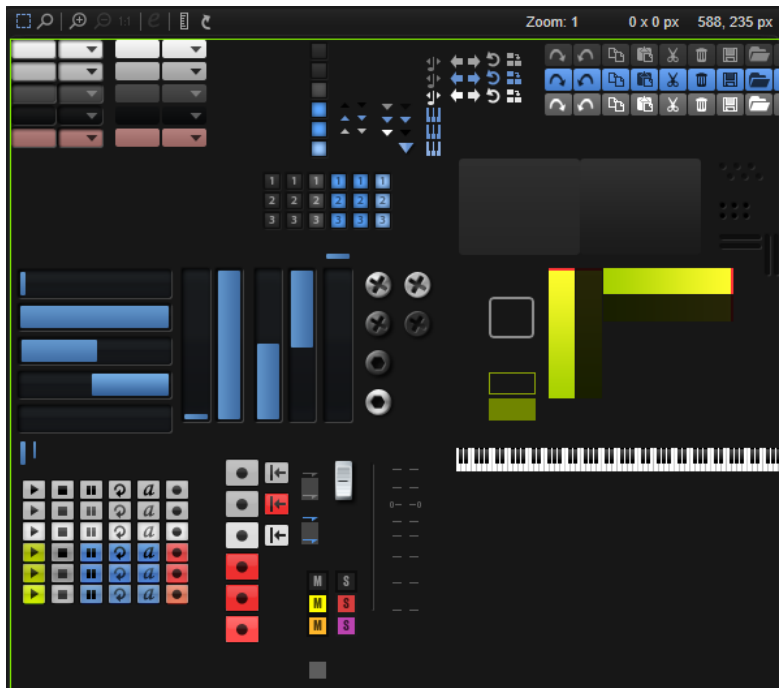
Toolbar

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
are only visible 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**.
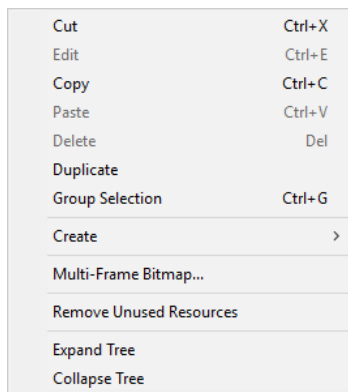
Modifying a Section

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**.

Resources Tree Context Menu

Cut	Ctrl+X
Edit	Ctrl+E
Copy	Ctrl+C
Paste	Ctrl+V
Delete	Del
Duplicate	
Group Selection	Ctrl+G
Create	>
Multi-Frame Bitmap…	
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 at the current position.

Delete

Deletes the selected element.

Duplicate

Duplicates the selected element.

Group Selection

Allows you to group multiple selected elements.

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 create a multi-frame bitmap.

Remove Unused Resources

Removes the unused resources from the **Resources Tree**. This is useful to clean up your macro page.

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.

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 are only visible 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.

Using 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.
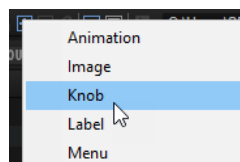
2. Select the knob element, and specify its bitmap in the **Bitmap** field in the **Properties** section.

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

To edit a template, click **Edit Element** on the toolbar or select **Edit** on the context menu. This opens the **GUI Tree** for the template, that is, only the template content is shown.

You can edit templates in the same way as other macro page elements. When you have finished editing, click **Switch Back to Macro Page/Parent Template** to leave template editing and return to the editing of the macro page. The modifications are now visible in every occurrence of the template on the macro page.

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.
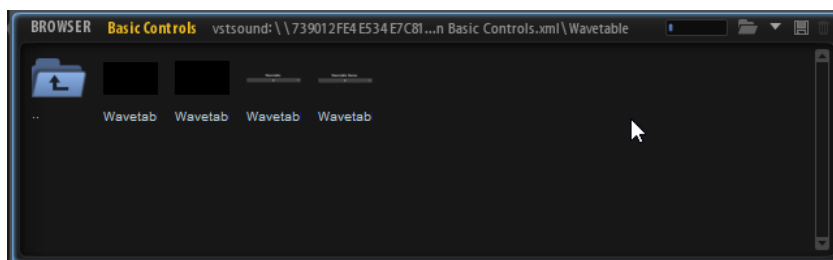
To specify the folder that you want to browse for files, click the **Select Folder** icon on the toolbar and navigate to the folder on your system, or select one of the locations from the **Select Location** pop-up menu.

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.

You can group selected elements in the **GUI Tree**, the **Templates Tree**, and the **Resources Tree** using the context menu command **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

You can resize elements in the following ways:

- 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

You can copy elements in the following ways:

- Hold down **Alt** and drag it to another position.
- Hold down **Alt** and use an arrow button.

  The copy is added with a distance of one pixel. To add a copy at a **Coarse Step** distance, press **Alt-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
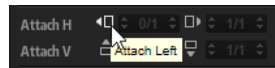
Activate this button to attach the child to the left side of the parent object. Resizing the parent object to the left will also move the child to the left, to keep its relative position to the left edge of the parent.

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.
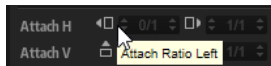
If this parameter is set to 1/1, the border of the edge follows the template edge exactly. With a value of 1/2, for example, the edge only follows with half the speed, which means that if the template edge is moved by 10 pixels, the attached edge is only moved 5 pixels.

- 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 into 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

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.

Searching for Elements

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.
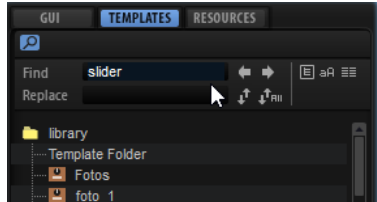
Only Visible

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 **Properies** 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 416

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**.
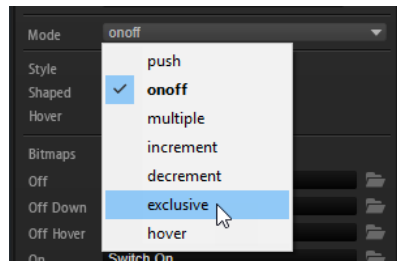
This way, the switch performs one exclusive switching operation. In this case, we want it to open the about box.

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

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 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.

Connecting Parameters Via an Editor in HALion

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.

Connecting Parameters Via Drag and Drop

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.

Connecting Multiple Parameters of the Same Type in One Go

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 423

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>**.

Collaborating 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 http://developer.steinberg.help

RELATED LINKS
[Exporting Macro Pages with their Resources](#) on page 424

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

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 that can be compared 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.

You can find guidelines and further information in the Steinberg Developer Resource pages under http://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 character, the instrument category it belongs 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 filter your search for content belonging 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.

There are no restrictions regarding the type of preset that you can assign to a library. However, if you are creating libraries for use in HALion Sonic SE, it is better practice to be more restrictive, that is, to treat a library like an individual instrument with dedicated presets.

Target Users and Creation Process for Libraries

Before you create a library, you must decide who your target users or customers are. You could build a library that only HALion users can use, which gives you the freedom to build a macro page that is larger than the size that HALion Sonic supports, for example. However, this limits the number of potential users.

Most often, you will probably want to build your library so that it works with HALion Sonic SE, which means that it can be used by everybody. HALion Sonic SE is freely available for download on the Steinberg web site.

If you want to create a library for all users, you must export your program as a HALion Sonic SE layer preset. You can find the corresponding command on the **Program Tree** context menu.

Prerequisites

When you want to create a library, you need a program that is set up the way you want it and that can be played and adjusted using the quick controls and the macro page.

Below follows an exemplary list of the main steps that are usually performed to finalize the content before creating a library.

1. You have sampled all the required sounds and noises.

2. You have cut and processed all the samples.

3. You have mapped the samples to the keyboard.

4. You have structured the samples into 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 that are to be used by the instrument, for example, a MIDI player.

7. You have added custom script code to realize some special playing features.

8. You have added busses and effects to control the audio routing and deliver the integrated effects that you want to be part of the instrument.

9. You have configured the quick controls to add more control over the sound.

10. You have built a macro page with all the knobs, sliders, and other elements that you need to control the sound of your instrument.

11. You have assigned the macro page to the program.

NOTE

If you want your library to work in HALion Sonic SE, the **Program Tree** should contain a program and a layer. The program is exported as a HALion Sonic SE 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 are going to build the library **Precious Guitar**.

PREREQUISITE

●   You have exported your program under the name **Precious Guitar Layer** using the **Export Program as HALion Sonic SE Layer preset** command on the **Import/Export** submenu of the **Program Tree** context menu.

●   If you want to distribute HALion Sonic SE Program presets that combine several layers, you have loaded the preset `Precious Guitar Layer.vstpreset` into a slot in HALion Sonic.

●   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**, etc.

> **NOTE**
>
> Do not specify the **Library Name** and **Manufacturer** attributes at this point, because when building the VST Sound container, these tags are overwritten by the attributes that are defined for the library.

- You have created all 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, too.

4. Set the **Family** to **HALion Sonic SE**.

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 the location where you want the VST Sound containers to be created.

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 and all presets are placed inside.

    The **Unassigned Samples** list now lists all samples that are used in the presets.

13. Select all samples in 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 deliver any sub presets for effects or MIDI modules, everything is now in place to build 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.

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 always modify presets and the macro page and build the container afterwards again. The **Library Creator** always takes the files as they are in the moment of the build process.

Using HALion Sonic Edit Mode

HALion Sonic Edit Mode allows you to edit a HALion Sonic or HALion Sonic SE 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/HALion Sonic SE libraries, the most common workflow is probably the following:

1 In HALion, you create a HALion Sonic SE init layer which represents the instrument.

2 You load this init layer into HALion Sonic/HALion Sonic SE.

3 You create your HALion Sonic/HALion Sonic SE 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 will probably 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/HALion Sonic SE, 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 HALion Sonic/HALion Sonic SE preset. If you already created program presets that are using this init layer preset, these steps must be performed for all those program presets. This is where **HALion Sonic Edit Mode** comes in useful. In combination with the scripting functionality, it allows you to automatically modify a large number of presets that are all loaded in the **Program Table**, for example.

You activate **HALion Sonic Edit Mode** in the **Edit** section of the **Options Editor**.
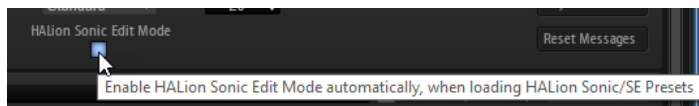
NOTE

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 34

Building Selected VST Sounds

If you added or modified VST Sound containers in a library, you can update these modified VST Sound containers before rebuilding the library.

PROCEDURE

1. In the **VST Sound Containers** section, select the containers that you added or modified.

2. Right-click in the list and select **Build VST Sounds**.

RESULT

This rebuilds all the selected VST Sound containers in the list.

AFTER COMPLETING THIS TASK

After building the containers, you can build the library.

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.

This method has the advantage that you can rebuild the container if something needs to be fixed, and HALion will instantly see this modified container.

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 and HALion Sonic SE, 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.

RESULT

You have checked that the library is functional and you are now ready to distribute it to friends and/or customers.

You can also verify the functioning of a library using Steinberg's **Library Manager**.

Versioning of the VST Sound Containers of a Library

Each VST Sound container in a library has an individual version number that must be increased whenever a container is rebuilt, for example, to be delivered to customers as an update. This versioning ensures that the **Library Manager** can overwrite older VST Sound containers with newer ones that have higher version numbers.

You can increase the version number for one or more selected VST Sound containers, enter information regarding the current version with the **Increase Version Number** button, and edit the entire history of a container by clicking **Edit Version History**.

To track the changes that were made to a library, each VST Sound container has a separate change history file.

RELATED LINKS

Macro Page Resources

When building a library, it is necessary to also 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. All 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 over several VST Sound containers, the macro page and script resources are automatically added to each container. This means that if you want to update your macro page or scripts, you must rebuild all preset containers and provide them to the user, to guarantee that all presets use the updated macro page.

Library Creator Editor

The **Library Creator** is available as a HALion editor.
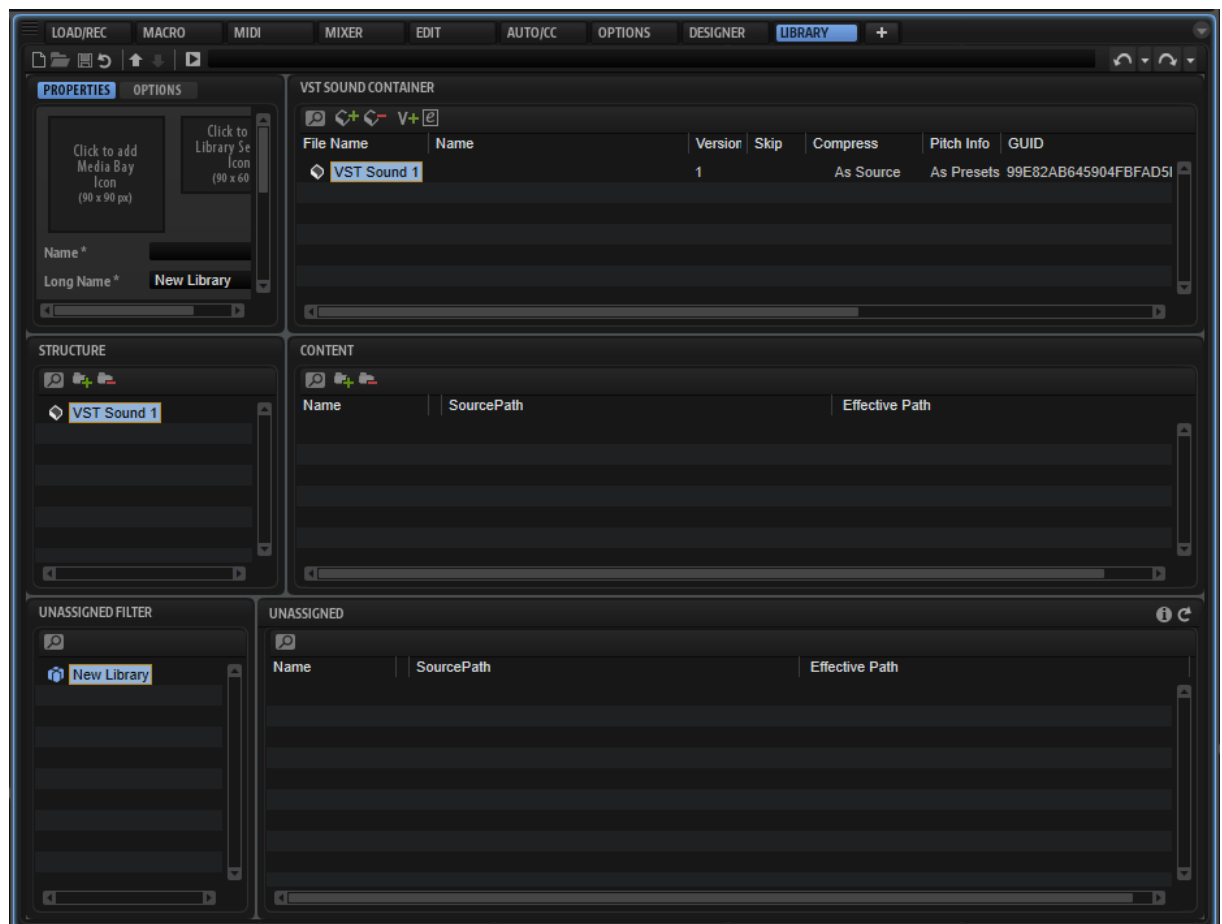
The editor is divided horizontally into three rows, each consisting of two panes. In the topmost row, you can set global properties for the library and define which VST Sound containers are part of it.

The second row shows the structure of the selected VST Sound container as a tree view in the **Structure** section on the left and as a file list in the **Content** section on the right.

The third row shows the list of unassigned samples and VST Sound containers on the right. The **Unassigned Filter** section on the left allows you to filter the list.

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.

RELATED LINKS
Window Handling on page 11

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 will discard all changes that have been made.

Mount VST Sound containers temporarily to HALion MediaBay

Allows you to mount the VST Sound containers that you created for this library temporarily 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. If a library is registered and mounted in HALion, HALion Sonic, or HALion Sonic SE 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 or HALion Sonic SE, these 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 the VST Sound containers that were temporarily mounted.

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. Only the changes in the library file can be undone/redone, other HALion editing actions are not affected.

Properties

In this section, you can name the library, add icons and further information. All text fields with an asterisk (*) are mandatory.
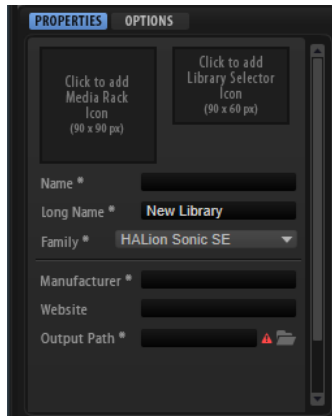
MediaRack Icon

> Click this field to select the icon that you want to be shown in the **MediaBay** of the Steinberg DAW. The image must be a `.png` file and must be 90 x 90 pixels in size.

Library Selector Icon

> Click this field to select the icon that you want to be shown in the library selector. The image must be a `.png` file and must be 90 x 60 pixels in size. Below the icon, you can see a preview of the library name as it will be shown in the library selector. This indicates whether the library name is too long to be displayed in its entirety.

NOTE

MediaRack and library selector icons support **High DPI Mode**. 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" at the end of the file name, for triple-resolution files, add "_3.00x", etc.

Name

> Here, you must specify the name of the library. If you change the name after having created VST Sound containers, you will be asked whether you want to rename the library or create a new one. If you create a new library, all VST Sound containers get new unique identifiers.

> IMPORTANT

> It is important not to reuse VST Sound containers with the same identifiers for different libraries.

Long Name

> Here, you must specify a longer version of your library name. This will be 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 for which plug-in you want to build your library.

- **HALion**: These presets cannot be loaded in HALion Sonic and HALion Sonic SE.
- **HALion Sonic**: These presets can be loaded in HALion Sonic and HALion, but not in HALion Sonic SE.
- **HALion Sonic SE**: These presets can be loaded in HALion, HALion Sonic, and HALion Sonic SE.

Most often, you will probably want to build your library so that it works with HALion Sonic SE, which means that it can be used by everybody. HALion Sonic SE is freely available for download on the Steinberg web site.

Manufacturer

Here, you must add your name or the name of your company.

Website

Allows you to add a URL to your web site.

Output Path

Here, you must specify the folder on your system into which the VST Sound files are written. Each container is saved in a separate subfolder.

Options
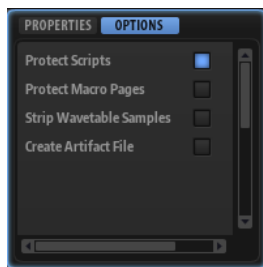
Protect Scripts

Activate this option if you want to encrypt all script files that are part of the library. This means that users will not be able to see or edit the script code.

Protect Macro Pages

Activate this option to protect the macro pages that are used in the library. If a macro page is protected, its structure cannot be or edited in the **Macro Page Designer**. This is useful if you want to export a program as HALion Sonic SE 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

When creating wavetables that are based on samples, the reference paths to the used samples are stored with the presets. This allows you to come back to a wavetable and modify some of the wave markers. As soon as you want to deliver these presets to others, you have the choice to either add all the source samples that you have used to the VST Sound container, so that the user can perform these modifications too, or you can decide to only deliver the presets with the final

wavetables. In this case, you can remove the information about the used samples in the wavetable editor 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.

VST Sound Containers

This list 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 are delivering with the library.
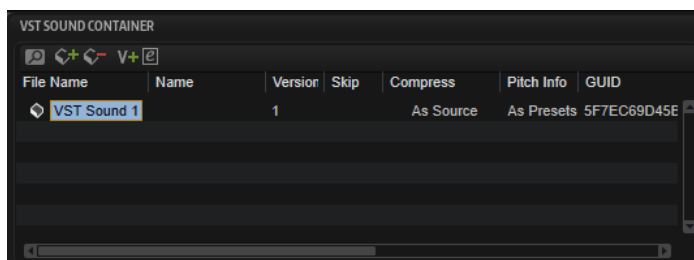
Toolbar

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 for the current search result.

- **Replace All**: Replaces the text for all search results.

- **Search for Content in all VST Sound containers**: By default, the search is performed only on the list of VST Sound Containers. Activate this option if you want to extend the search to the entire library and the lists of unassigned samples and VST Sounds.

- **Case Sensitive**: Activate this option to make the search case sensitive.

- **Search in all Attributes**: Activate this option if you want 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.

If multiple VST Sound containers are selected, **Increase Version Number** changes the version numbers for all the containers. Each version number is increased by one 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

The attribute columns allow you to specify for each VST Sound container how it should be built.

File Name

Allows you to specify the name of the VST Sound container. The file name extension is `.vstsound`.

NOTE

To avoid that two VST Sound container files with the same name built by two different people get into conflict, each container has an internal unique identifier, which is created automatically by the **Library Creator**. However, you should nevertheless use a naming scheme for VST Sound containers that makes them easy to identify. This can be a combination of numbers, abbreviations for your company, and the library name, for example.

Name

Allows you to add an additional name that will be shown 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 that you update the container and distribute it to the public, be sure to increase the version number.

Comment

Allows you to add a comment.

Skip

In some cases, it can be helpful 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. In this case, activate **Skip** for the sample containers.

NOTE

- If presets in your library are referring to other VST Sound containers, these 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 the samples in the 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 are compressed.

Pitch Info

Allows you to add sample pitch data to the 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 where **Solo** mode is selected in the **AudioWarp** section.

- If this parameter is set to **All Samples**, pitch data for all the samples is added to the VST Sound container.

  NOTE

  This should be activated 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

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 guarantee that they can be found by HALion, HALion Sonic, or HALion Sonic SE and the **MediaBay**.
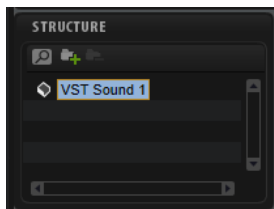
Folder Types
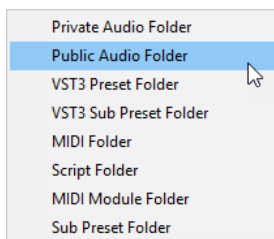
Private Audio Folder

This folder is added automatically 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

If you want to make your samples accessible via the **MediaBay**, you must add the samples to this folder.

NOTE

Be sure to assign attributes to your samples, to make it easier to find and manage them in the **MediaBay**.

VST 3 Preset Folder

This folder is added automatically when you add a preset.

VST 3 Sub Preset Folder

You can add this folder for presets that are used as a sub library for layers. These presets do not appear in the **MediaBay** and are only used as source layers that can be loaded via a script into a program. 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 if you select the topmost VST Sound node in the **Structure** section and drag 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 that can be associated with the library as a first-level subfolder, the user can navigate through the MIDI file selector more easily. 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 in 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. Normally, it is not necessary to add scripts manually 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 add scripts manually to a VST Sound container. Scripts that require these additional scripts will 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 http://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 to the **MediaBay**, they will appear in the MIDI module selector. You can also add subfolders to define in which folder of the MIDI Module selector you want your module to appear. You can add your 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 sub presets, 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 added 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 also create multiple **VST 3 Preset** folders and subfolders and drop presets to the 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, HALion Sonic, and HALion Sonic SE, 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 here, 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**, you must 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

This section shows the content of the folder that is selected in the **Structure** section. You can add files here using 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 for the current search result.

- **Replace All**: Replaces the text for all search results.

- **Case Sensitive**: Activate this option to make the search case sensitive.

- **Search in all Attributes**: Activate this option if you want 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 according to 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 the sub presets are written to the correct path inside the VST Sound container, so that they become available on the sub preset selector on the macro page.

NOTE

The effective path shown here is not the complete path of a file, which also contains the GUID of the VST Sound archive. If you need to know 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**.
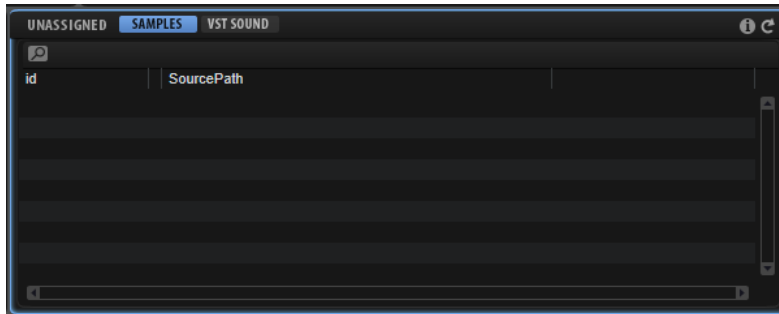
When dropping preset files into a VST Sound container, the **Samples** list is filled with all samples that are required. Then, you can decide which VST Sound container you want them to be part of. In the most simple case, your library only consists of a single VST Sound container. In this case, you can 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 over the contents of the container. To select only some samples, use the **Unassigned Filter** section to limit the selection of samples to the selected presets.

This filter possibility becomes even more powerful if you want to distribute samples over multiple VST Sound containers. This could be necessary if you want 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. In this case, you can drag a part of the samples on one VST Sound container and the rest on another. This will create a **Private Audio Folder** in each VST Sound container and add 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**. For this, you must add them to the **Public Audio Folder**.

RELATED LINKS
How Samples Are Handled on page 439

Unassigned VST Sound Containers

When you add presets to your library that use samples referring to other VST Sound containers, these containers are added as required VST Sound containers to the **Unassigned VST Sound** list.
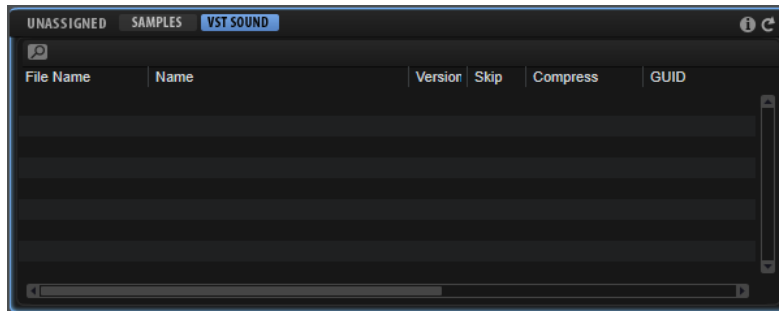
This allows you to change the structure of your library if you do not want to reference external content.

If you want the maximum number of people to be able to use your library, for example, with Steinberg's free HALion Sonic SE, you should avoid dependencies to other VST Sound containers.

For example, if your presets contain layers or samples that use HALion/HALion Sonic content, such as Auron, HALiotron, or Voltage, the presets can be used by HALion and HALion Sonic users. If your presets contain layers or samples that use HALion Sonic SE libraries, such as Basic, Artist, or Trip, they can be used by Cubase Artist or Cubase Pro users, etc.

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 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 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 for the current search result.
- **Replace All**: Replaces the text for all search results.
- **Case Sensitive**: Activate this option to make the search case sensitive.
- **Search in all Attributes**: Activate this option if you want to search for text in all attribute columns. Otherwise, only the name column is searched.

Show Issues

Click here to open 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 will not prevent the **Library Creator** from building the VST Sound container, however. They should be understood as an indicator of the issues that you might want to fix before releasing the library.

Checks are performed for the following:

- HALion Sonic and HALion Sonic SE presets for which no macro page is assigned
- HALion Sonic and HALion Sonic SE presets for which no quick controls are assigned
- the 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
- Only one of the parameters **Signature** and **Tempo** is set
- Presets with the same name (case sensitive)
- An incorrect size for the macro page if it is to be used in HALion Sonic and HALion Sonic SE

When starting the library build process, the **Library Creator** may encounter additional issues which can stop the build process. If that happens, a report window opens that informs you why the process could not be executed. The reasons could be that you did not fill out one of the mandatory fields in the library properties, or that required samples, presets, or macro page resources could not be found, because they were removed from your file system after the library file was created, for example.

Effects Reference

Introduction

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.

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 to the sound. The result is a very natural sounding reverb. Included with this effect is a collection of high-quality reverb impulse responses.

Impulse Response

Allows you to select an impulse response. This determines the basic sound character of the reverb.

Reverse

Reverses the impulse response.

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. At a setting of 100 %, the impulse response is applied with its original length.

Size

Scales the size of the simulated room. At 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. At 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 between 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 listener.

Early Reflections

Here, you 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.

Show Early Reflections Page/Show Chorusing Page

With these two buttons below the **Early Reflections** pop-up menu, you can choose whether to display the early reflections settings or the chorusing settings in the lower left part of the effect panel.

ER/Tail

Sets the level balance between the early reflections and the reverb tail. At 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. At a setting of 100 %, the dimensions correspond to a cathedral or a large concert hall. At 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. At 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. With positive values, low frequencies decay longer and vice versa. Frequencies will be 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.

Size

Adjusts the length of the early reflections pattern. At a setting of 100 %, the pattern is applied with its original length and the room sounds the most natural. At settings below 100 %, the early reflections pattern is compressed and the room is perceived smaller.

ER Low Cut

Attenuates the low frequencies of the early reflections. The higher this value, the fewer low frequencies are present in the early reflections.

ER High Cut

Attenuates the high frequencies of the early reflections. The lower this value, the fewer high frequencies the early reflections will have.

Shape

Controls the attack of the reverb tail. At a setting of 0 %, the attack is more immediate, which is a good setting for drums. The higher this value, the less immediate the attack.

Density

Adjusts the echo density of the reverb tail. At a setting of 100 %, single reflections from walls cannot be heard. The lower this value, the more single reflections can be heard.

Tail High Cut

Attenuates the high frequencies of the reverb tail. The lower this value, the fewer high frequencies the reverb tail will have.

Width

Adjusts the output of the reverb signal between mono and stereo. At 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

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 like a ping-pong ball between left and right 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

Activate **Sync** 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 Time 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. At a setting of 0 %, you hear only one echo. At a setting of 100 %, the echoes repeat endlessly.

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

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:

On/Off

Activates/Deactivates the 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 parameters **Gain** and **Freq** simultaneously, drag the points in the EQ curve display.

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.
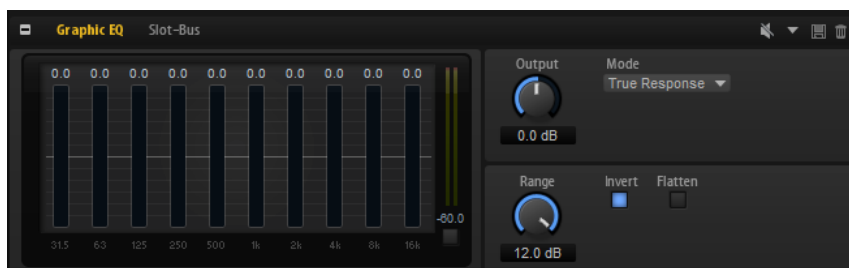
Output

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 where the resonance depends on the amount of gain.
- **Constant Q** mode uses parallel filters where the resonance is raised when boosting the gain.

Range

Adjusts the maximum cut or boost for all frequency bands together.

Invert

Activate this to invert the EQ curve.

Flatten

Resets all frequency bands to 0 dB.

DJ-EQ

This plug-in 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.

Filter Effects

Auto Filter

Auto Filter provides two morphable filter shapes with distortion.

The 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

- LP 24, 18, 12, and 6 are low-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies above the cutoff are attenuated.

- BP 12 and BP 24 are band-pass filters with 12 and 24 dB/oct. Frequencies below and above the cutoff are attenuated.

- HP 6+LP 18 and HP 6+LP 12 are combinations 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.

- HP 12+LP 6 and HP 18+LP 6 are combinations 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.

- HP 24, 18, 12, and 6 are high-pass filters with 24, 18, 12, and 6 dB/oct. Frequencies below the cutoff are attenuated.

- BR 12 and BR 24 are band-reject filters with 12 and 24 dB/oct. Frequencies around the cutoff are attenuated.

- BR 12+LP 6 and BR 12+LP 12 are combinations 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.

- BP 12+BR 12 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.

- HP 6+BR 12 and HP 12+BR 12 are combinations 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+LP 6 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.

- HP 6+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. At 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 Waveform and Shape

Waveform selects the basic type of waveform. **Shape** changes the characteristic of the waveform.

- **Sine** produces smooth modulation. **Shape** adds additional harmonics to the waveform.

- **Triangle** is similar in character to **Sine**. The waveform periodically ramps up and down. **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. At 50 %, it produces a square wave.

- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts silence before the sawtooth ramps up.

- **Log** is a logarithmic curvature. **Shape** continuously changes the curvature from negative to positive.

- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and produces a smooth random signal when fully turned 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 produces a smooth random signal when fully turned right.

Freq

Determines the frequency of the cutoff modulation.

Sync

Activate this to 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
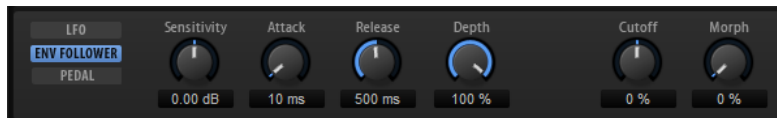
The Envelope Follower traces the input signal with an adjustable attack and release time and delivers a modulation signal representing the level envelope of the signal.

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.

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 independently for filter shape A and B.
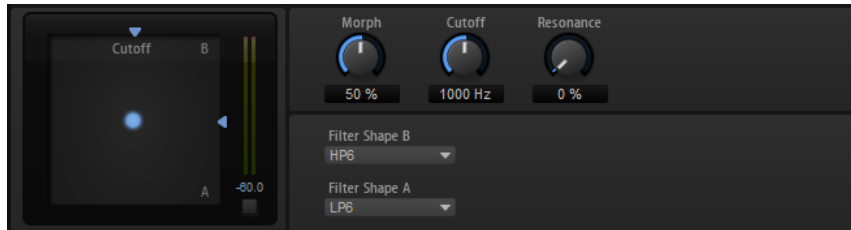
Filter Shape B

Here, you can choose between several high-pass and band-rejection filter shapes.

Filter Shape A

Here, you can 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 sound of the human voice or of acoustic instruments can be characterized by their 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.

The Resonator effect comes with 14 predefined filter shapes that determine the basic sound character. In addition, three LFOs can be used to modulate each filter separately, which allows for adding extra motion to the sound.

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

Option	Filter Low/Mid/High
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 Tab

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. At 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 from the LFO.

LFO Tab

LFO Waveform and Shape

- **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 produced.

- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned 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

Activate this 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 independently 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.

Freq Low/Freq High

These parameters determine the frequency of the filter for the low and high pedal positions.

Width Low/Width High

These parameters determine the width (resonance) of the filter for the low and high pedal positions.

Gain Low/Gain High

These parameters determine the gain of the filter for the low and high pedal positions.

Slope

Here, you can choose between two filter slope values: 6 dB or 12 dB.

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

Determines the type of amplifier. The sound character of the overdrive changes with the amplifier. To bypass the amplifier, select **No Amp**.

Speaker Model

Determines the speaker model type. Each model colors the sound uniquely. 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

Adds brightness to 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.

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.

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.

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 get a dynamic microphone. Settings in between allow you to fade between the characteristics of these two microphones.

Microphone Position

Here, you can choose between 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** (Left) only distorts the left input channel. The right channel remains clean and unprocessed.

- **R** (Right) only distorts the right input channel. The left channel remains clean and unprocessed.

- **L+R** (Left + Right) sums the two input channels into a mono signal which is then distorted.

- **Stereo** distorts the two input channels independently.

NOTE

The **L** and **R** modes allow you to cascade two VST Amp effects, that is, to use the first one to processes the left channel and the second one to process the right channel at different 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.
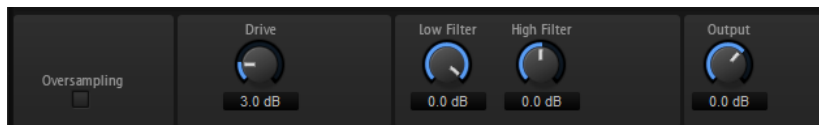
Mode

Here, you can choose between the effect of a single (**One Stage**) or two cascaded tape machines (**Two Stage**). **Two Stage** mode leads to higher saturation and compression.

Oversampling

Activate this parameter to increase 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

Activate this option for an automatic level compensation.

Low Filter

Here, you can adjust the low frequency range below 1000 Hz by +/- 3 dB.

High Filter

Here, you can 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.
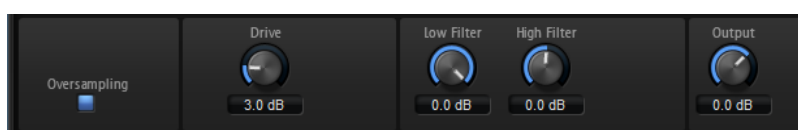
Oversampling

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.

Pitch Shift Effects

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.
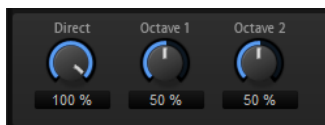
Direct

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

Chorus

Chorus thickens and broadens the sound by means of pitch modulation.
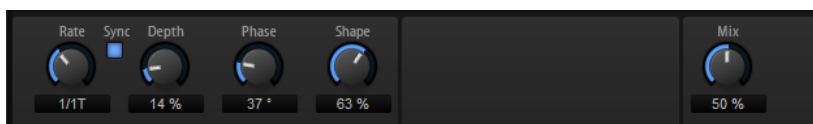
Rate

Determines the frequency of the pitch modulation, in Hertz.

Sync

Activate this 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. At a setting of 0 %, the pitch changes continuously, producing a steady modulation. At 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

Activate this to set the **Rate** value in fractions of beats.

Depth

Sets the intensity of the pitch modulation.

Phase

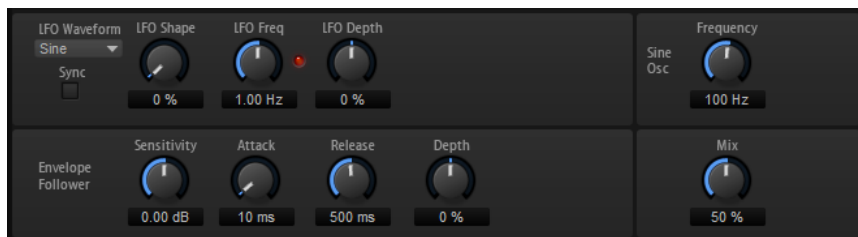Widens the sound image of the effect from mono to stereo. This parameter also changes the characteristic of the **Cross FB** parameter.

Shape

Adjusts the characteristics of the modulation. You hear this best when **Feedback** is activated. At a setting of 0 %, the sound sweeps linearly up and down. At 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

Activate this 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 characteristic of the **Cross FB** parameter.

Shape

Adjusts the characteristics of the modulation. You hear this best when **Feedback** is activated. At a setting of 0 %, the sound sweeps linearly up and down. At 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 and **Long** a less defined, more blurred flanger sound.

S&H Mix

Use this parameter to blend the normal modulation signal with the stepped modulation signal. At 100 %, only the stepped modulation is used.

Smooth

> Use this parameter to create 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

> Activate this 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

> Activate this 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

The Ring Modulator 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 characteristic of the waveform.

- **Sine** produces smooth modulation. **Shape** adds additional harmonics to the waveform.

- **Triangle** is similar in character to **Sine**. The waveform periodically ramps up and down. **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. At 50 %, it produces a square wave.

- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts silence before the sawtooth ramps up.

- **Log** is a logarithmic curvature. **Shape** continuously changes the curvature from negative to positive.

- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and produces a smooth random signal when fully turned 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 produces a smooth random signal when fully turned right.

LFO Freq

Use this to specify the frequency of the LFO for modulating the frequency of the sine oscillator.

Sync

Activate this 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

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. The **Sensitivity** parameter sets the optimum input level for the Envelope Follower.

Attack

This adjusts the attack time, that is, the time the Envelope Follower needs to approach increasing input levels.

Release

This 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, where the frequencies are shifted by a factor, and where the harmonic relations are kept, 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

Here you set the amount of frequency shift.

Freq Fine

Here you can fine adjust the amount of frequency shift.

L/R Offset Coarse

Sets an offset for the left and right channels. Positive values shift the right channel upwards and the left channel downwards, and vice versa.

L/R Offset Fine

Allows for fine-adjustments of the offset between the left and right channels. Positive values shift the right channel upwards and the left channel downwards, and vice versa.

Mod Coarse

Sets the maximum amount of frequency shift via modulation from LFO and Envelope Follower.

Mod Fine

Allows for fine-adjustments to 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 speed of this effect with the **Frequency Fine** parameter.

Notches

Here you set the number of notches the phaser effect produces when you use larger amounts of Feedback.

LFO Section

LFO Waveform and Shape

Waveform selects the basic type of waveform. **Shape** changes the characteristic of the waveform.

- **Sine** produces smooth modulation. **Shape** adds additional harmonics to the waveform.

- **Triangle** is similar in character to **Sine**. The waveform periodically ramps up and down. **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. At 50 %, it produces a square wave.

- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts silence before the sawtooth ramps up.

- **Log** is a logarithmic curvature. **Shape** continuously changes the curvature from negative to positive.

- **S & H 1** produces random stepped modulation, where each step is different. **Shape** puts ramps between the steps and produces a smooth random signal when fully turned 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 produces a smooth random signal when fully turned 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

The Rotary effect 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 speed producing different amounts of Doppler effect. The amplifier of the rotary speaker adds a warm sounding distortion, and the horn, drum, and cabinet color the sound uniquely. 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

This parameter 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 sounds the most interesting.

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 to color the horn and drum with the sound of the cabinet. At a setting of 100 %, you get the full sound of the cabinet.

Balance

Here you adjust the balance between the horn and drum microphones. At a setting of 0 %, you hear only the drum. At a setting of 100 %, you hear only the horn.

Slow

Adjusts the slow speed of the horn and drum together.

Fast

Adjusts the fast speed of the horn and drum together.

Accel

Adjusts the acceleration time for raising and lowering the rotation speed of the horn and drum.

Horn Mic Angle

This adjusts the stereo spread of the horn microphones. At a setting of 0°, the sound image is monophonic. At a setting of 180°, the sound image is fully stereo.

Drum Mic Angle

This adjusts the stereo spread of the drum microphones. At a setting of 0°, the sound image is monophonic. At 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

The Vibrato effect emulates the chorus and vibrato effects of vintage organs. It thickens the sound by means of pitch modulation.
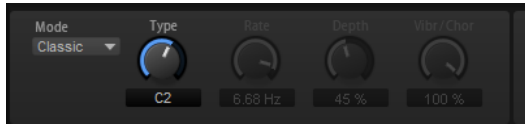
The effect provides direct access to the classic chorus and vibrato settings (C1, C2 and C3 and V1, V2 and V3). In addition, there is a custom mode that allows you to adjust the amount of chorus or vibrato freely.

Type

Here, you can select the classic chorus and vibrato settings. This control is only available if the effect is set to **Classic** mode.

Custom Mode

Activate this to adjust the chorus and vibrato settings freely with the **Rate**, **Depth**, and **Vibr/Chor** controls.

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

If **Sync** is activated, you can 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, with 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 effects Compressor, Limiter, Brickwall Limiter, Expander, Gate, and Maximizer work with an internal look-ahead function to guarantee 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 run into latency issues, you have the following possibilities:

- For the effects Compressor, Expander, and Gate, activate the **Live** button to use the effects without look-ahead functionality.
- For the effects Limiter, Brickwall Limiter, and Maximizer, 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

The 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 stay untreated.

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.

Soft Knee

If this button is deactivated, signals above the threshold are compressed instantly 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 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 Compressor reacts to sounds that exceed the threshold. The longer the attack time, the longer the time it takes to reduce the gain. With longer attack times, the onset of sounds exceeding the threshold pass 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 set threshold. The longer the release time, the longer it takes to return to the original level.

NOTE

This parameter is not available if the **Auto Release** button is activated.

Auto Release

Activate this 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 according to peak or RMS values or a mixture of both. At a setting of 0 %, the Compressor uses Peak sensing only and at 100 %, RMS sensing only. Peak means that the Compressor directly 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 and RMS sensing for sustained sounds.

Live

If this button is activated, the look-ahead feature of the effect is disengaged. Look-ahead produces 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, 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 lets you 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

Adjusts the mix between dry signal and 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 (50 to 20000 Hz)

If the **Side-Chain** button is activated, this sets the center frequency of the filter.

Q-Factor

If the **Side-Chain** button is activated, this sets the resonance or width of the filter.

Limiter

The Limiter effect prevents the sound from exceeding the set output level. This can be used to avoid clipping in following 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.

Auto

Activate this to set the release time automatically. The Limiter analyzes the input sound continuously to find the optimal setting.

Brickwall Limiter

Brickwall Limiter ensures that the output level never exceeds a set limit.
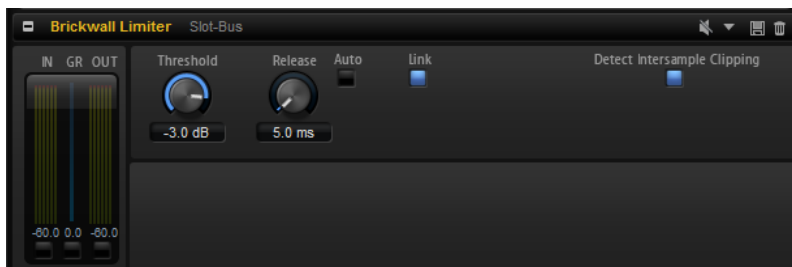
Due to its fast attack time, Brickwall Limiter can reduce even short audio level peaks without creating audible artifacts. However, this plug-in creates a latency of 1 ms. Brickwall Limiter features separate meters for input, output, and the amount of limiting.

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

> If this button is activated, **Brickwall Limiter** uses the channel with the highest level to analyze the input signal. If the button is deactivated, each channel is analyzed separately.

Detect Intersample Clipping

> If this option is activated, **Brickwall Limiter** 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

This plug-in raises the loudness of audio material without the risk of clipping.
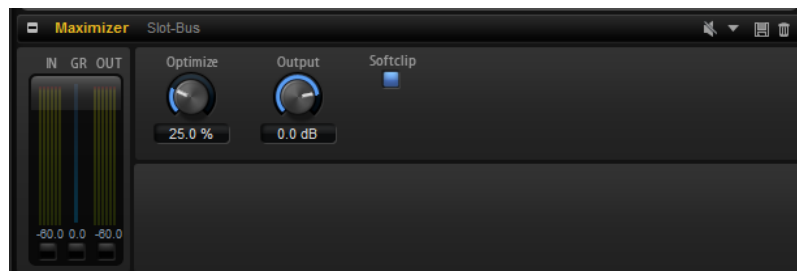
Optimize

> 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 stay untreated.

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 according to the set ratio. When **Soft Knee** 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 according to peak or RMS values or a mixture of both. At a setting of 0 %, the Expander uses Peak sensing only and at 100 %, RMS sensing only. Peak means that the Expander directly 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 and RMS sensing for sustained sounds.

Live

If this button is activated, the look-ahead feature of the effect is disengaged. Look-ahead produces 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

Activate this button 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

Activate this to set the Release time automatically. The Gate analyzes the input sound continuously to find the optimal setting.

Peak/RMS

Determines whether the input signal is analyzed according to peak or RMS values (or a mixture of both). At a setting of 0 %, the Gate uses Peak sensing only and at 100 %, RMS sensing only. Peak means that the Gate directly 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 and RMS sensing for sustained sounds.

Live

If this button is activated, the look-ahead feature of the effect is disengaged. Look-ahead produces 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

This 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.
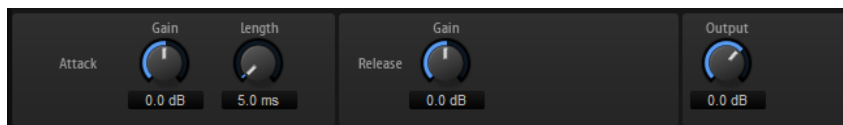
Attack - Gain

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

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

This plug-in expands the stereo width of stereo audio material. It cannot be used with mono files.
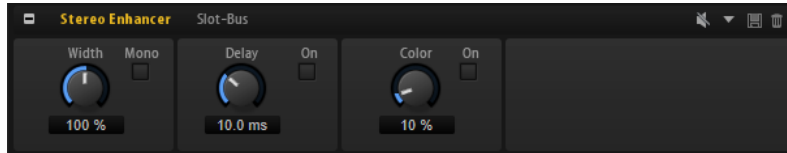
Width

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 possible unwanted coloring of the sound which sometimes can occur when enhancing the stereo image.

Surround Effects

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 independently using the corresponding knobs or 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. To position the handle at a specific position, click at this 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 in 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**.

- To restrict movement to diagonal (bottom right to top left), press **Alt-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**.

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 complete 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 get 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.

Tools Effects

Channel Router
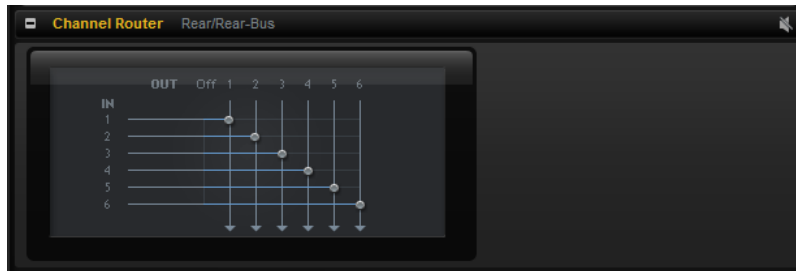
This effect allows you to change the channel routing of a bus, to adapt the channel format to different multi-channel samples. Each of the six input channels can be routed to a specific output channel.

Legacy Effects

HALion 3 Legacy Effects

In addition to the standard effects, a number of effects from HALion 3 is also provided. These effects can be selected from the **Legacy** submenu of the effects menu.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

Shelf EQ

Simple tone control.

Output

Output level trim.

Bass

Low frequency cut/boost.

Treble

High frequency cut/boost.

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.

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.

Limiter

Hard level limiting.

Drive

Input signal drive.

Attack

Attack time.

Release

Release time.

Output

> Output level trim.

Compressor

A simple compressor effect.

Threshold

> Compression threshold.

Ratio

> Compression amount.

Attack

> Attack time.

Release

> Release time.

Output

> Output level trim.

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.

Gate

Simple gate effect.

Threshold

> Gate threshold.

Range

> Level reduction when gate closed.

Attack

> Attack time.

Release

> Release time.

Output

> Output level trim.

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.

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.

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.

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.

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.

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, multiple MIDI modules can be assigned 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**.

Which modules are affected is specified with the buttons at the top of the editor.

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 between the 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.
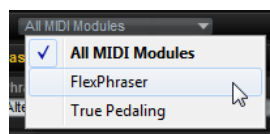
ABS/REL

Allows you to select whether you want to make absolute or relative changes to the parameters.

SEL/ALL

Allows you to select whether the editing is applied to all or to the selected MIDI modules.

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, directly process the MIDI events. Other MIDI modules, like True Pedaling, produce modulation signals that must be assigned as source or 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 as submenus on the **Create New MIDI Module** menu.

● 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.

FlexPhraser

The FlexPhraser is an arpeggio and phrase player.

You can select 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 19

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 work only 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.

Record Output

Allows you to record the MIDI output of the arpeggiator.

Variations

Click the variation buttons to switch between the available variations.

Loop

If this option is activated, the phrase plays 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 repeats 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 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

Defines whether the order in which the notes are played on the keyboard affects the playback of the phrase.

- If **Sort** is selected, the notes are played in the order of the selected phrase. The chronological order does not have any influence.

- 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 that is used 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 get the velocity of the note that you play.

- If **Aftertouch** is selected, the triggered notes get their velocity from the aftertouch controller.

- If **Poly Pressure** is selected, the triggered notes get their velocity from the poly pressure controller. This allows you to control the velocity per key.

- Select **MIDI Controller** to open a submenu where you can select a MIDI controller.

  The value of this MIDI controller is used as velocity for the triggered notes.

Fetch

If the **Vel Controller** pop-up menu is set to **Aftertouch**, **Poly Pressure**, or a MIDI controller, the **Fetch** option can be used 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 get their velocity from the controller.

- If **Fetch** is deactivated, the generated notes get 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. This way, the phrase gets 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 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 blinking to indicate record mode.
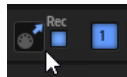
2. Play some notes.

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 huge amount 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 avoid that the variation switches 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 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

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.
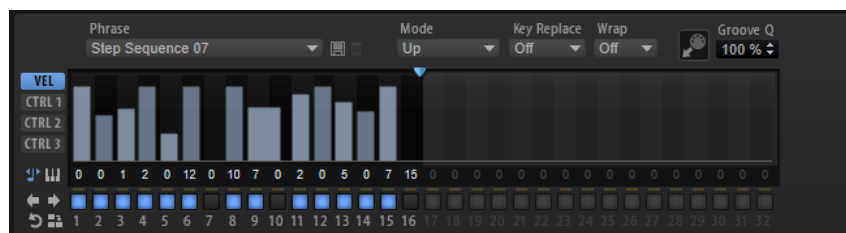
You can display the velocity curve or three MIDI controller sequences for the phrase.

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

Determines how the notes are played back.

- 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 are pressed 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 separately, which allows you to create very elaborate phrases.

NOTE

Key Select cannot be used in **Step** or **Chord** mode.

- 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 missing keys are replaced.

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 normally.
- **Arp** replaces the missing keys with the note that the arpeggio would normally play.
- **Rest** does not replace any missing keys. The arpeggio plays 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 separately for each 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.

Controller Curve

To show a controller curve, click one of the controller buttons on the left.
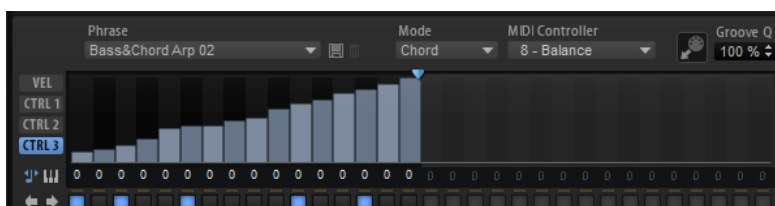
MIDI Controller

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 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 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** and draw a line.
● To draw symmetric ramps at the beginning and the end of the sequence, hold down **Shift-Alt** and draw a line.
● To transpose a step, click in the field below it and enter the number of semitones for the transposition.

NOTE

You can only transpose steps if **Show Transpose or Key Select** shows a note icon, not a keyboard icon.

● 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 the following step, this following 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 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 entirely.

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 loosing 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 19

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 blinking.
2. Do one of the following:
   - Play a chord or a single note and then click the pad that is blinking 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 drag a chord event onto the internal keyboard first, 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**.

  Now, 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 Variation**.

   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.

Naming Pads

Entering names for pads allows you to get 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.

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.
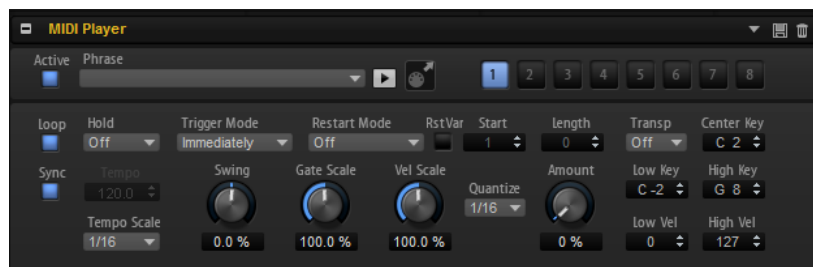
You can use the Trigger Pads to switch between variations.

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.

Loading MIDI Phrases

To load a MIDI phrase, do one of the following:

● 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, this 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 repeats 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. This way, the phrase gets 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 avoid that the variation switches 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 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.
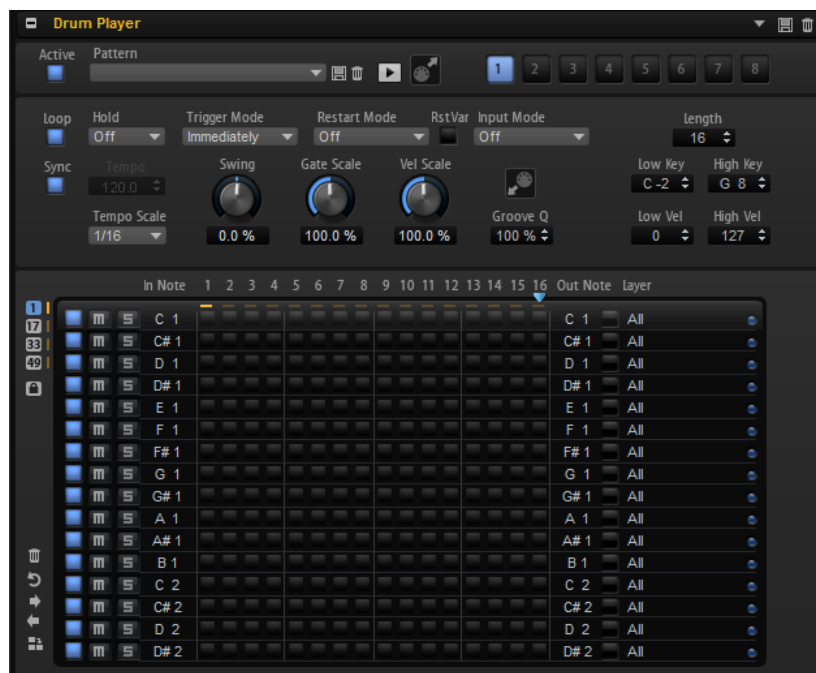
You can set up eight different patterns using the variation buttons and use the Trigger Pads to switch between variations.

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 19

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
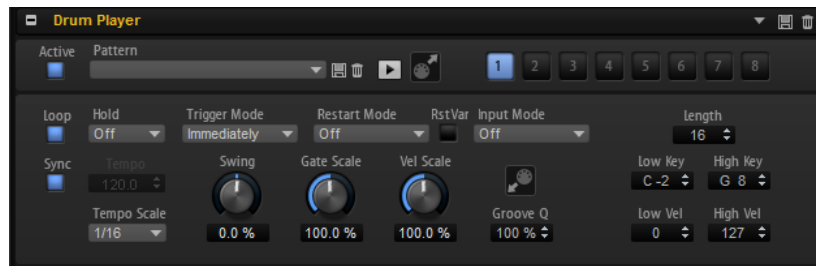
Active

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 repeats 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 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 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.**

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 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.

Drum Player Pattern Editor

You can create and edit the patterns in the pattern editor in the lower section.

Pattern Editor Parameters

Page buttons

A pattern can contain up to 64 steps. These 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 currently playing.

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, these 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** ⑤ 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.
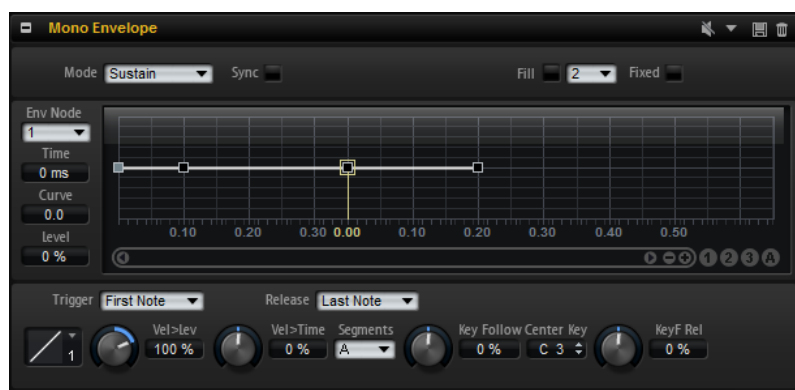
You can set up conditions for triggering and releasing the envelope. By default, this envelope is bipolar.

RELATED LINKS
Modulation Matrix Parameters on page 127
Envelope Section on page 113
Handling Section and Module Presets on page 19

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. Then, the loop is repeated for as long as the key is held. 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

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

- If **Fixed** is activated and you move selected nodes on the time axis, only the selected nodes are moved.

- If **Fixed** is deactivated, all nodes that follow the edited nodes are also moved.

Env Node

Displays the focused envelope node.

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.

Curve

Allows you to adjust the curvature of the envelope curve 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 following 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 (Vel>Lev)

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. Positive values increase the level of the envelope the harder you hit a key. Negative values decrease the level of the envelope the harder you hit a key.

Level Velocity Curve

You can select a curve to specify how the incoming velocity translates to the level of the envelope.

The characteristic of each curve is displayed by a small icon.

Time Velocity (Vel>Time)

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

Here, you can select which phases of the envelope are affected by the **Time Velocity** parameter.

- **Attack** – The velocity affects the attack only.
- **Attack + Decay** – The velocity affects all phases until the sustain.
- **Decay** – The velocity affects all phases until the sustain 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 set **Center Key**, that is, the envelope becomes faster the higher the note you play.
- Negative values increase the phase lengths for notes above and decrease the phase lengths for notes below the **Center Key**, that is, the envelope becomes slower the higher the note you play.

Mono LFO

You can add monophonic LFOs as MIDI modules to the program. 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 where one LFO controls 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 19

Mono LFO Parameters

LFO Waveform and Shape

- **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 produced.

- **Ramp** is similar to the **Saw** waveform. **Shape** increasingly puts 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 randomly stepped modulation, where each step is different. **Shape** puts ramps between the steps and changes the **S & H** into a smooth random signal when fully turned 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 when fully turned 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 which 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 number of steps of the step modulator.

Phase

Sets the initial phase of the waveform that is used when the LFO is retriggered.

Random

If this button is activated, each note starts with a randomized start phase. The **Phase** control is deactivated.

Mono Step Modulator

You can add the step modulator as MIDI module to the program and use it as a modulation source in the modulation matrix of a zone.

RELATED LINKS
Step Modulator on page 122

Mono Step Modulator Parameters

Steps

Sets the number of steps in the sequence. The maximum number of steps is 32.

Sync Mode

- If **Off** is selected, you can adjust the speed at which the sequence repeats.
  Whether the sequence restarts when you play a note depends on the **Retrigger Mode**.
- If **Tempo + Retrig** is selected, you can 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**.

- If **Tempo + Beat** is selected, you can 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. The **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.

Triplet

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 at which 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 only for rising edges.
- **Slope on Falling Edges** creates ramps only for falling edges.
- **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

These commands 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

On acoustic pianos, pressing the sustain pedal after a certain 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. To bring the crossfade into 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 is triggered.

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 check that your expressions can be true.

PROCEDURE

1. On 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.

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

Combines two conditions logically.

- 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

Activate this to invert 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

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

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.
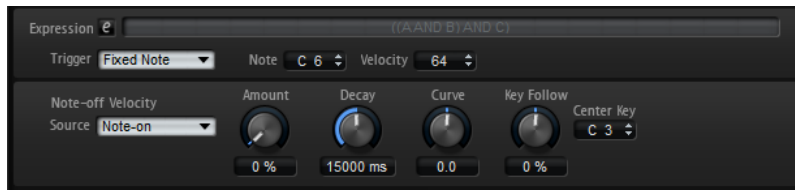
Expression

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 slower.

Decay Key Follow

Allows you to scale the decay time depending 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 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 528

MegaTrig Conditions

On the **Conditions** pop-up menu, you can select the events for your condition.
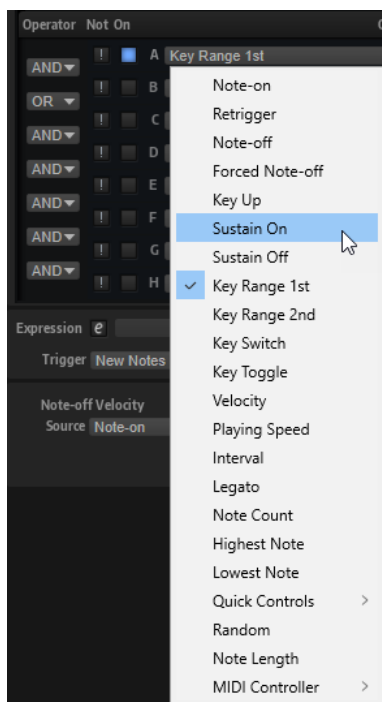
Note-on

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 together into one program, for example.

Key Toggle

This condition toggles between true and false each time that you hit a key within the specified note range. By default, the condition is true. If you toggle 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 contains 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 able to send 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.

NOTE

A simple way to trigger zones using note-off messages without setting up the decay of the note-off sample is using the **Note-off Trigger** option in the **Voice Control** section for a zone.

RELATED LINKS

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, so that you will not trigger it accidentally 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 with the **Note** and **Velocity** controls.

Layer Alternate

You can use this module to switch between different layers automatically. 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.
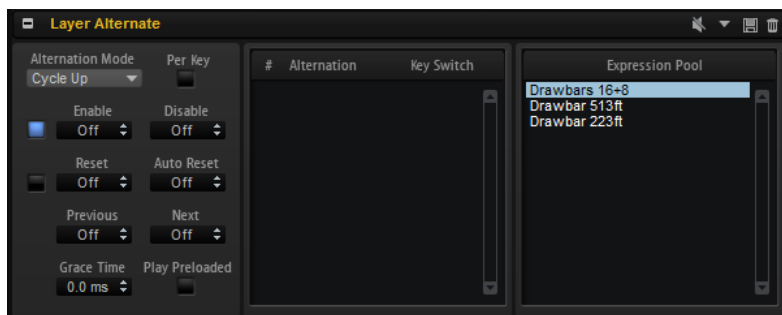
RELATED LINKS
Handling Section and Module Presets on page 19

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 **Alternation List** in the order in which you want them to alternate.

   You can rearrange the order of the list using drag and drop. To remove a layer from the list, use the context menu.
3. Select the **Alternation Mode**, make sure that **Enable** is activated, and start playback.

   NOTE

   Depending on the selected **Alternation Mode**, the layers alternate in the order in which they are listed or randomly.

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

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 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 according to their index number, that is, from the lowest number upwards.

- Select **Cycle Down** to cycle through the layers in the **Alternation List** in descending order according to their index number, that is, from the highest 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

Activate this option 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 reset the layer alternation automatically 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 with a different layer.

Key Switch Alternate

This module allows you to switch automatically between different layers that are using MegaTrig key switches.
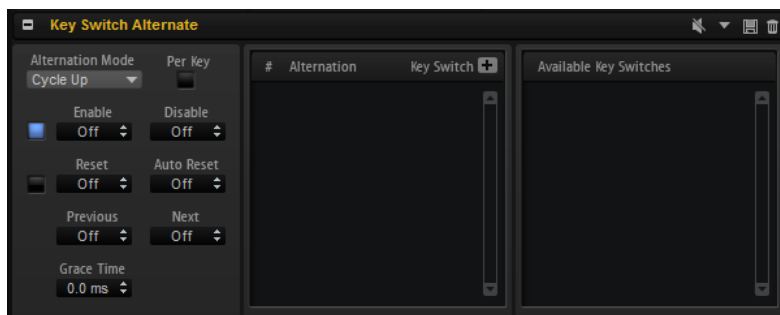
Key Switch Alternate is provided for compatibility with HALion 3 programs, because in HALion 3, the alternation between layers was realized using key switches. With the current program version, use the Layer Alternate module instead.

RELATED LINKS
Handling Section and Module Presets on page 19

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 using 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 alternate in the order in which they are listed or randomly.

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 according to their index number, that is, from the lowest number upwards.

- Select **Cycle Down** to cycle through the key switches in descending order according to their index number, that is, from the highest 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

Activate this option 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 reset the key switch alternation automatically 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 with 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.
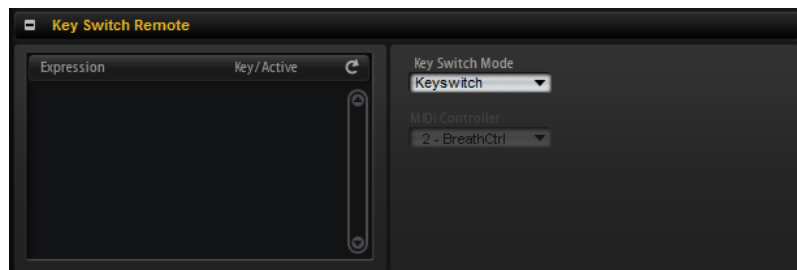
Key Switch Remote Parameters

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.

Refreshing the Expression List

If you add, move, or remove layers with key switches after adding the Key Switch Remote module, it might be necessary to refresh the expression list.

To refresh the list, click **Refresh** ↻.

MIDI Randomizer

The MIDI Randomizer module allows you to trigger notes randomly.
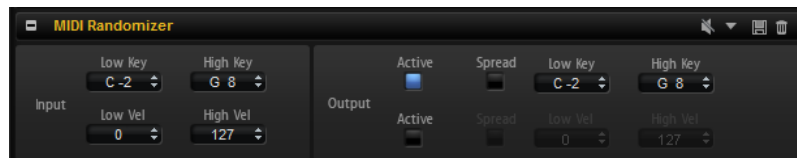
The notes that are used by the MIDI Randomizer can be created by modifying the original notes and/or velocity values using an adjustable deviation amount, or within a completely independent range that can be set for key and/or velocity. You can also limit the input range for incoming MIDI notes to decide on which notes the module reacts.

RELATED LINKS
Handling Section and Module Presets on page 19

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 that is specified with 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 how much 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 that is specified with 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 how much 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.
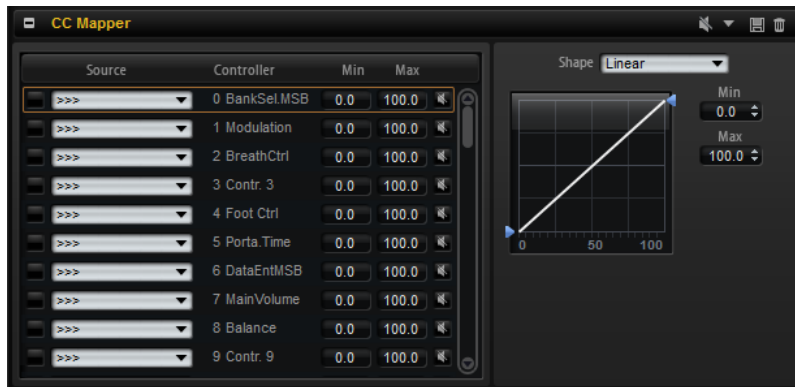
MIDI controllers, aftertouch, and pitchbend can be mapped freely to all MIDI controllers, aftertouch, pitchbend, and the eight global controllers, that is, **Contr. A** to **Contr. H**.

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 19

CC Mapper Parameters

Source

Determines the source controller that is to be remapped.

Controller

This column lists the available destination controllers.

Bypass

Allows you to deactivate 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, displayed 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 using 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 using a MIDI controller.

RELATED LINKS
Handling Section and Module Presets on page 19

Velocity Curve Parameters

Curve display

In the Curve display section to the left, you can 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

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

With the minimum and maximum values, you can specify the output velocity. The curve is compressed accordingly.

Controller Mode

This parameter 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.
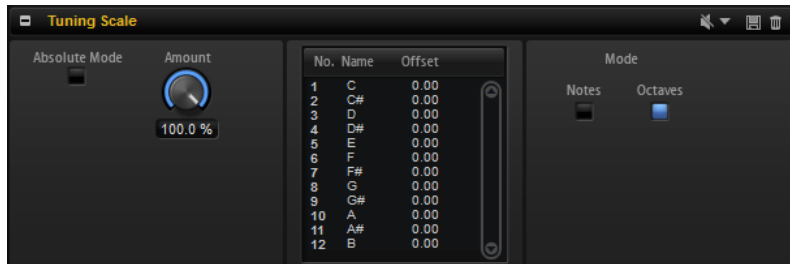
Presets

The most commonly used scale in western music is the equal tempered scale, where adjacent notes have an equal distance of 100 cents. Other well-known traditional tuning scales are the well-tempered scale or the Kirnberger scale, for example.

You can find examples of these scales 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 the tuning scale is applied. At a setting of 100 %, the tune offsets are applied as specified in the tuning scale. Lower values reduce the tune offsets relatively. At 0 %, the tuning scale is not applied.

Notes Mode/Octaves Mode

Determines whether your tuning changes are applied equally to all octaves on the keyboard or only to specific notes.

RELATED LINKS
Handling Section and Module Presets on page 19

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 apply the tune offsets equally 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., refer to the online documentation that can be found under http://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.
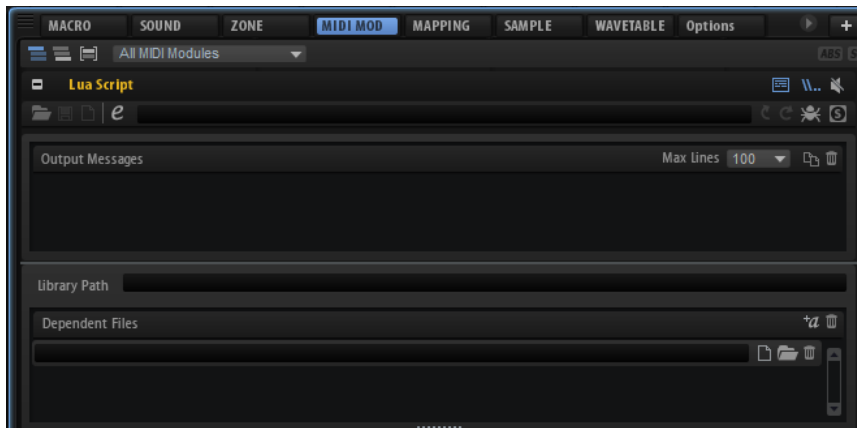
Toolbar

Load Script

Allows you to load a script from disk.

The loaded file is referenced by the script module.

Save Script

Scripts that are created with the internal editor can be saved 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

If a syntax or runtime error occurs when processing the script, this indicator lights up. 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 specify where **require** searches for libraries.

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

Activate this button to automatically add the files that you included using 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	V
Copy	Ctrl/Cmd-C
Cut	Ctrl/Cmd-X
Delete	Delete or Backspace
Edit	Ctrl/Cmd-E
Group Selection	Ctrl/Cmd-G
Hide Non-Selected	Ctrl/Cmd-Shift-H
Hide Selected	Ctrl/Cmd-H
Move Down	Shift-Down Arrow
Move Hi Key Left	Alt-Left Arrow
Move Hi Key Right	Alt-Right Arrow
Move Hi Velocity Down	Alt-Down Arrow
Move Hi Velocity Up	Alt-Up Arrow
Move Left	Shift-Left Arrow
Move Low Key Left	Ctrl/Cmd-Left Arrow
Move Low Key Right	Ctrl/Cmd-Right Arrow
Move Low Velocity Down	Ctrl/Cmd-Down Arrow
Move Low Velocity Up	Ctrl/Cmd-Up Arrow

Option	Key Command
Move Right	**Shift-Right Arrow**
Move Up	**Shift-Up Arrow**
Mute	**M**
Paste	**Ctrl/Cmd-V**
Redo	**Ctrl/Cmd-Shift-Z**
Rename	**F2**
Replace Samples	**Ctrl/Cmd-R**
Select All	**Ctrl/Cmd-A**
Select None	**Ctrl/Cmd-Shift-A**
Select Tree	**Ctrl/Cmd-T**
Show All	**Ctrl/Cmd-Shift-U**
Show Selected	**Ctrl/Cmd-U**
Solo	**S**
Undo	**Ctrl/Cmd-Z**

Global Category

Option	Key Command
Down	**X**
Enable Mapping Selection Options	**Ctrl/Cmd-M**
Import Samples	**Ctrl/Cmd-I**
Left	**A**
Right	**D**
Up	**W**

Media Category

Option	Key Command
Open	**Return** or **L**

Navigate Category

Option	Key Command
Bottom	**End** (Windows only)
Down	**Down Arrow**
Left	**Left Arrow**
Less	**Ctrl/Cmd-Num -**
More	**Ctrl/Cmd-Num +**
Right	**Right Arrow**
Toggle Selection	**Ctrl/Cmd-Space**
Top	**Home** (Windows only)
Up	**Up Arrow**

Zoom Category

Option	Key Command
Zoom In	**H**
Zoom Out	**G**

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 work 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.

Note Expression Editor

The editor 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 what their influence on the sound will be.

● The **Note Expression** editor can be found on the **Sound Editor** for a program.

NOTE

A Note Expression controller can be assigned to several destinations.

Name

If you assign a Note Expression controller for the first time, it gets the name of the modulation destination that it is assigned to. Any further assignments do not change the name. You can specify a name manually 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.

Using the Standalone Version of the Plug-In

You can use HALion independently from a host application.

If you use HALion as a standalone application, an additional section is available at the top of the control panel. Here, 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.
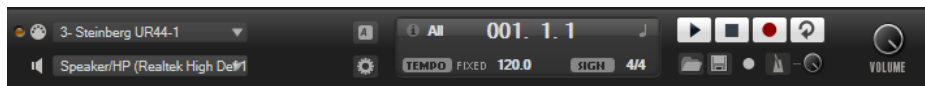
Making Preferences Settings

You can configure the standalone version of HALion in 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** on 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

Here, you can specify which inputs of the audio interface are connected to HALion's stereo input.

This is the input that can be selected in 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 in pairs to the front and rear channels, hold down **Alt-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 % and 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 used is 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

On 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 when you press a key and when you hear the sound.
>
> You can change the latency with the **Buffer Size** parameter in the control panel for your driver, opened 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 gets 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.

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
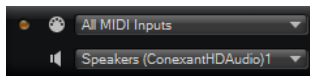
The MIDI input pop-up menu lists all MIDI devices that are installed on your system.

- Select the MIDI device that you want to use from the **MIDI Input** 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** pop-up menu.

RELATED LINKS

Scratch Pad

The scratch pad allows you to record and play back MIDI files in Standard MIDI File format. You can load existing MIDI files and you can record your own files and save them.
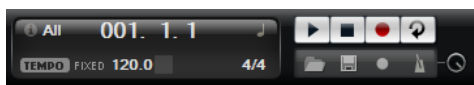
The transport section provides buttons for play, stop, record, and loop. The display shows the song position, the tempo, and the time signature of the MIDI file. In addition, there is a metronome that you can use for recording and practicing.

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.

Transport Controls

Play

> Click **Play** to start playback of the MIDI file. Playback always starts at the song position.

Stop

> Click **Stop** to pause the MIDI file at the current position. Click the button twice to reset the song position to the start.

Record

> Click **Record** to start recording.

Loop

> Activate **Loop** to play the entire MIDI file in a loop.

Info Icon

To check which MIDI file is loaded, point the mouse at the info icon in the top left corner of the scratch pad. A tooltip appears, showing the name of the MIDI file.

Song Position Indicator

The song position indicator shows the position of the transport. Above the song position indicator, the position is displayed numerically.

After loading a MIDI file, the display shows the full length of the file.

- To move the transport to a different song position, drag the song position indicator to the new position.
- To switch the time format between **Time** and **Bars**, click **Select Time Format** in the top right corner of the display.

Tempo and Time Signature

Below the song position display, the **Tempo** and **Time Signature** fields are located. These fields provide HALion with tempo and time signature information. These settings are used by the scratch pad and the metronome.

Fixed Tempo/Tempo Track

> Set this parameter to **Track** to follow 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.

Tempo Value

> Determines the tempo of the MIDI file.

Adjust Tempo

> If the **Tempo Track** option is selected, this parameter is available, allowing you to scale the playback relatively to the original tempo of the MIDI file.

Time Signature

Determines the time signature. You can enter the new signature as fractions of beats.

Recording Your Performance

PROCEDURE

1. Click the record symbol below the **Record** button to select a record mode.

   - To start recording immediately when you click the record button, 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 2 bars, select **Count In 2**.

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
Saving a MIDI File on page 553

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 multitrack MIDI file is loaded, you can play back all MIDI events or only the events of a specific MIDI channel.

- To specify which events to play back, 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 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.

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