Manuals+ — User Manuals Simplified.

d16 group Decimort 2 High Quality Bit Crusher User Manual

Contents

d16 group Decimort 2 High Quality Bit Crusher

Requirements
Software and hardware requirements of the product

Windows PC

- OS version Windows 7 or newer
- CPU 2.0 GHz SSE (Multicore 2.1 GHz recommended)
- RAM 8 GB (16 GB Recommended)
- Software VST2 / VST3 /AAX compatible host application (32bit or 64bit)

Apple Mac

- OS version OS X 10.13 or newer
- CPU Intel-based 1.8 GHz (2.4 GHz recommended), Apple M1
- RAM 8 GB (16 GB Recommended)
- Software AU / VST2 / VST3 / AAX compatible host application (64bit!)

Hardware requirements/recommendations are based on estimates performed on available computers at D16 Group HQ, and therefore cannot cover all possible configurations available on the market. CPU usage may vary widely depending on how the product is used. Factors that may contribute to variance in CPU usage include a particular patch and its complexity, the global quality setting, project sample rate. To form a better understanding of how a plug-in will behave within your current setup, we highly recommend downloading the demo and giving it a try.

Preliminary information

- This chapter contains general advice for using the plug-in's interface.
- To do a right-click on macOS with single-button mice:
- Either use your mouse click while holding the CTRL key on your keyboard or use two fingers on your touchpad.

Checking the value of a parameter
Right-click on any parameter to check its value in its context menu:
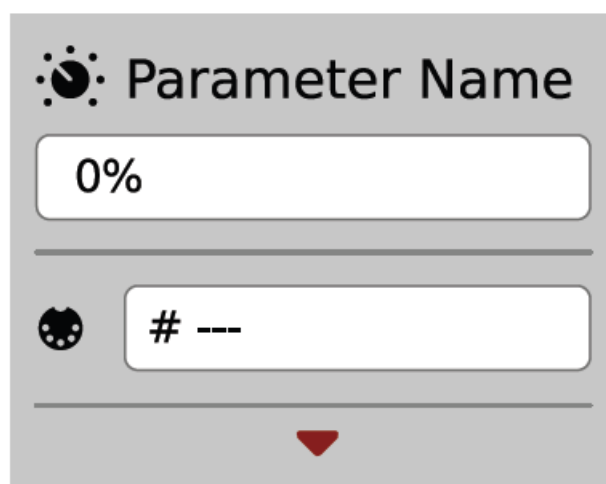
A parameter's context menu

Note: It's currently not possible to enter a precise value in the input box; it's just to check the value.

Fine-tuning continuous parameters
Tweak a control (knob) while holding the CTRL key (on Windows) or Apple CMD key (on macOS) – this will make

the tweaking more precise while moving the mouse pointer up and down.

Double-click to reset a continuous parameter's value
Double-clicking on a parameter restores its value to the initial state, either default (right after loading the plug-in / loading it along a project file) or from the most recently loaded preset.
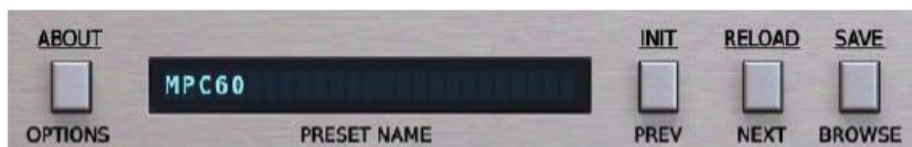
Overview

- Decimort is a stereo high-quality (ultra-low aliasing) bit crusher.
- After loading the plug-in within a host application, the GUI will appear:

Decimort graphical interface

There are two sections

- Configuration and preset management

Configuration and preset management section

- The signal processing control section consists of the all remaining controls

Signal flow
This chapter describes the path of the signal's flow through the Decimort plug-in and presents the basic components of this effect unit and its control parameters.

Basic modules
The inside of Decimort consists of a few basic components, that correspond to the sections on the graphical interface:
Pre-amplifier
Preamplifier, controlled by the Preamp knob, boosts the input signal within 0dB to +48dB range.


Preamp Parameter

Quantizer
Responsible for signal amplitude quantization. In other words, it divides the amplitude to a specified (Resolution display) number of levels.


Quantizer module

The quantizer is controlled by the following parameters:

- Resolution – The number of bits the input signal's amplitude is degraded to, which corresponds to 2Number of

  bits actual quantization levels ▶. Selecting the "–" value deactivates the whole Quantizer module.
- DC Shift – Quantization mode

- DC Shift LED off enables the mid-riser ▶ quantization mode.
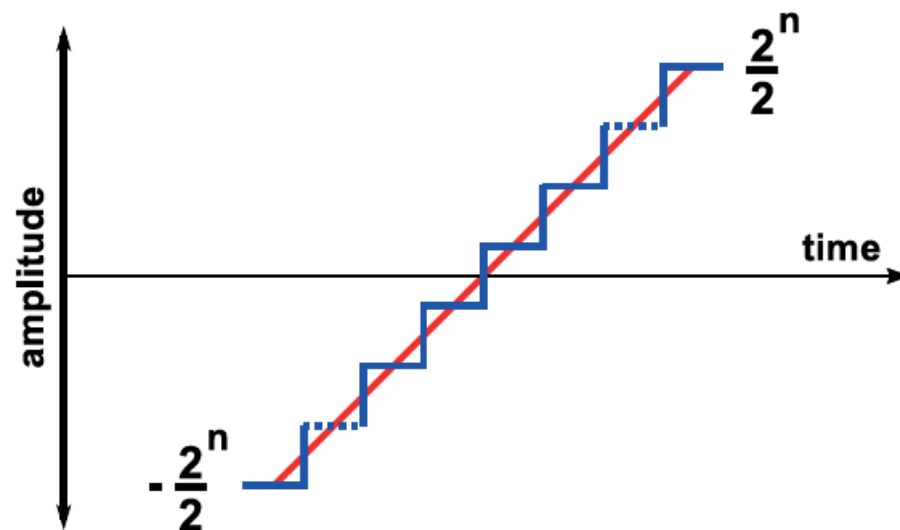
Nonzero quantization (mid-raiser)

- DC Shift LED, enables the mid-tread quantization mode

$$\frac{2^n}{2} - 1$$

$$-\frac{2^n}{2}$$
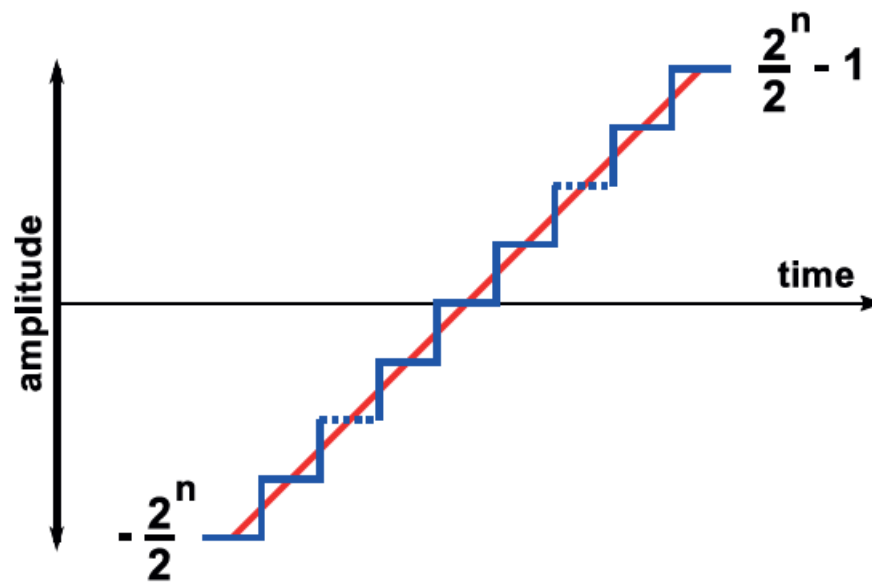
Quantisation including zero (mid-thread)

- Dithering – The intensity of the half-bit white noise, that is added to the signal just before the quantization. It reduces the harmonic distortions, being a result of signal amplitude degradation, by masking the side effects of quantization.

Resampler
This section controls the discretization process of the input signal in the time domain

Resampling unit

Most uniform quantizers for signed input data can be classified as being of one of two types: mid-riser and mid-tread. The terminology is based on what happens in the region around the value 0, and uses the analogy of viewing the input-output function of the quantizer as a stairway. Mid-tread quantizers have a zero-valued reconstruction level (corresponding to a tread of a stairway), while mid-riser quantizers have a zero-valued classification threshold (corresponding to a riser of a stairway)

The main parameters are located in the center of this section, and these are:

- Frequency – The frequency at the signal is discretized to (resampled).

- This parameter ranges from 44 Hz to 44.1 kHz
- Jitter – Controlling the intensity of random, short-period Resampler deviations▶.
- Additional parameters located aside from the main controls, supervise the processing of the signal before and after time discretization (Resampling). These include:
- Approximative Filter – Processing signal before resampling
- Images Filter – Processing signal after resampling

Approximative Filter
Optionally activated filter, which removes part, or entire harmonic content, above the Resampler's Nyquist frequency▶ from the input signal. Therefore controlling the amount of aliasing that occurs at the output (below the resampling frequency).
The Approximative filter module processes the input signal before it gets onto the Resampler.
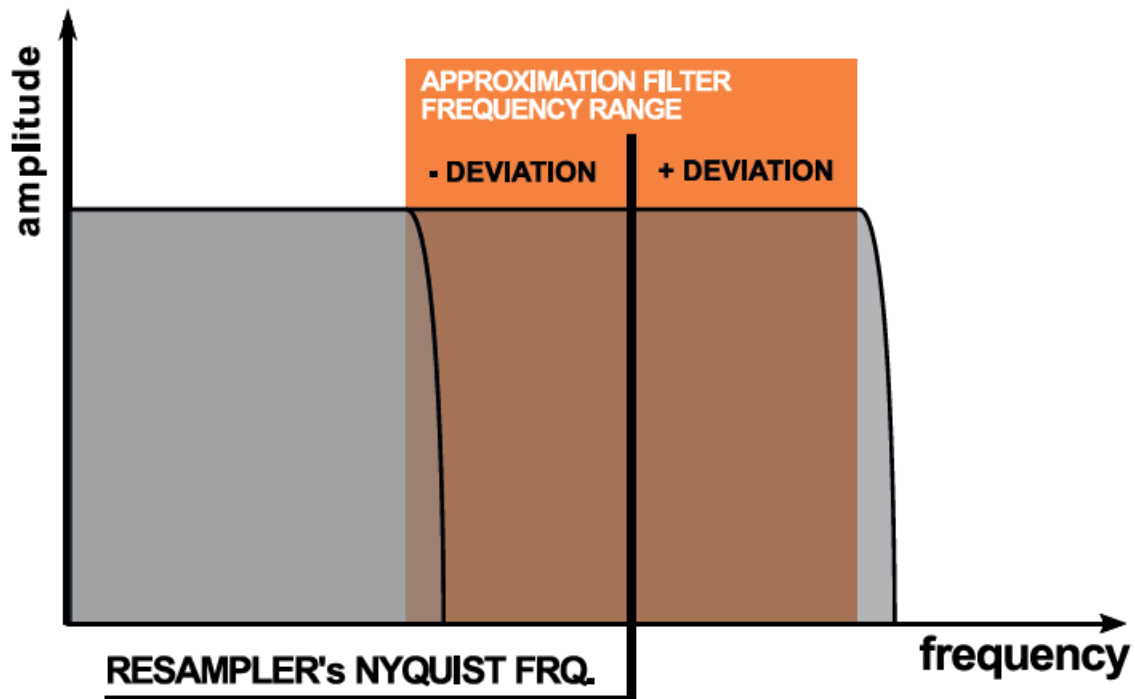

Resampler's Approximation filter

The Approximative filter is controlled by the following set of parameters

- Approx. Filter – The toggle button activates/deactivates the filter
- Frq. Deviation – The cut-off frequency of the Approximative filter is coupled with Nyquist's frequency of the Resampler. The offset between the filter's cutoff frequency and the Resampler Nyquist frequency is controlled by the Deviation parameter.
- Deviation = 0 (the default) – Sets the Approximative Filter's cutoff frequency, exactly at the Nyquist frequency (no offset). This results in the removal of the entire harmonic content above the Nyquist frequency, which prevents the artifacts from appearing below the Nyquist. The only type of artifacts occurring are images (harmonics occurring above the Nyquist).
- Deviation < 0 (negative offset) – Sets the Approximative filter's cutoff frequency below the Nyquist frequency. Consequently, at the output, as for Deviation = 0 value, the only type of occurring artifacts will be images (no

aliasing).

- Additionally, a part of the original harmonic content below the Nyquist frequency will also be removed (proportionally to the negative Deviation) as well as some images near the Nyquist.
- ▶ Jitter is the deviation from the true periodicity of a presumed periodic signal, often concerning a reference clock source
- ▶ Nyquist frequency of the Resampler equals half the Resampler's frequency. It means if the Resampler parameter is set to 2 kHz, the Resampler's Nyquist frequency (bandwidth) is only 1 kHz.
- Deviation > 0 (positive offset) – Sets the cutoff frequency above the Nyquist frequency. As a result, aliasing starts to appear (artifacts below Nyquist frequency) in proportion to positive Deviation.

The cutoff frequency range of the approximative filter.

Images filter
Images are the artifacts resulting from the Resampler's activity, which is the result of projecting a signal from a higher sampling rate to a lower / reduced signal's sample rate. Images Filter allows to remove part, or all of these artifacts from the spectrum after the discretization process. As a result, Decimort can also serve as an alias-free brickwall lowpass filter.
Image Filter's module processes the signal after it passes the Resampler.

Resampler's Images Filter

The image filter is controlled by the following set of parameters:

- Images Filter – Toggle button for its activation/deactivation
- Frq. Shift – The cut-off frequency of the image filter is coupled to the Resampler's Nyquist frequency. Frq.
- The shift parameter is the distance (offset) between the image filter's cutoff frequency and the Resampler's Nyquist frequency. The higher the value of this parameter, the higher harmonics (above Resampler's Nyquist) are passed onto the output.
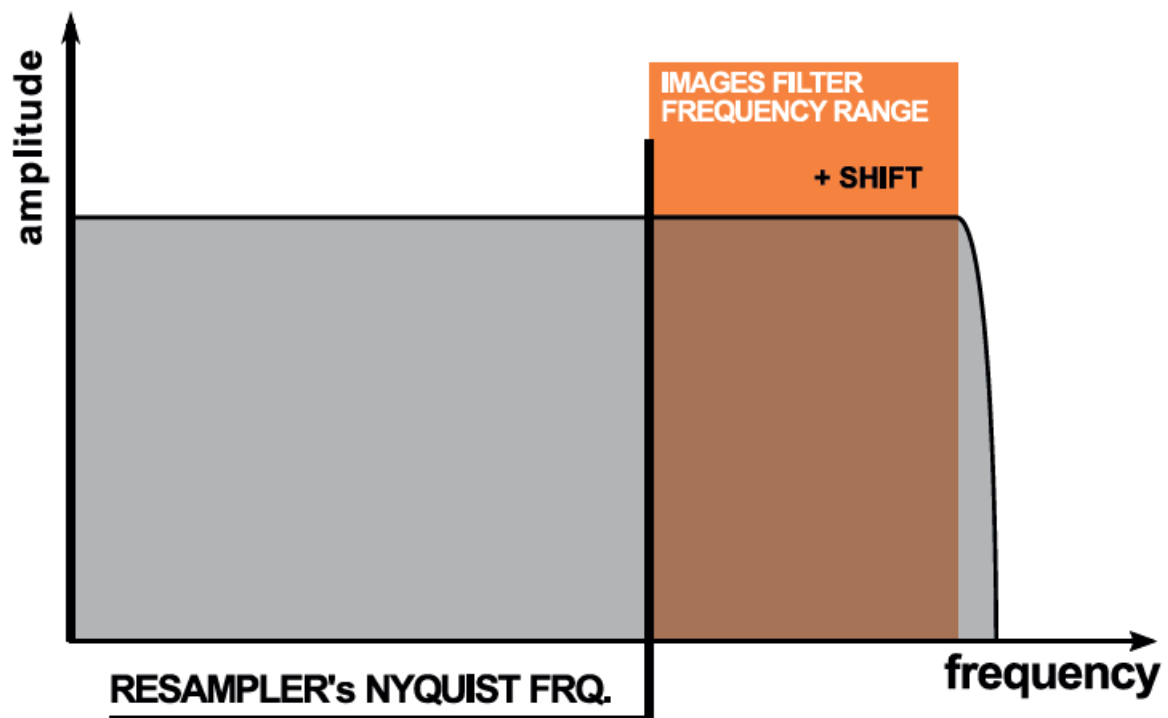
Images filter cutoff frequency range

Filter

After (or before) crushing signal we can also filter it a bit by analogue-like (pass/reject) filters with adjustable resonance.

Filtering section

The filter section is controlled by the following parameters:

- Filter type – There are 4 types of filters we can choose from: LP (low pass), BP (bandpass), HP (high pass), and BR (band rejects). OFF position – turns the filter off.
- Cutoff – Cutoff frequency for LP and HP, and center of the band for BR and BP.
- Reso/B.Width – Resonance for LP and HP, and bandwidth for BR and BP.

- Order – This switch has two values: when the switch is set to Pre, the signal is filtered then quantized and resampled, Post – in this position, a signal is first quantized/resampled and then filtered.

Master section

This section controls the end of the signal's flow.

Master section

The FX knob defines the ratio between the processed/unprocessed sound that is sent to an audio out. Output volume controls the final amplification.

Path of the signal's flow
See the diagram below, which shows the signal path inside Decimort.
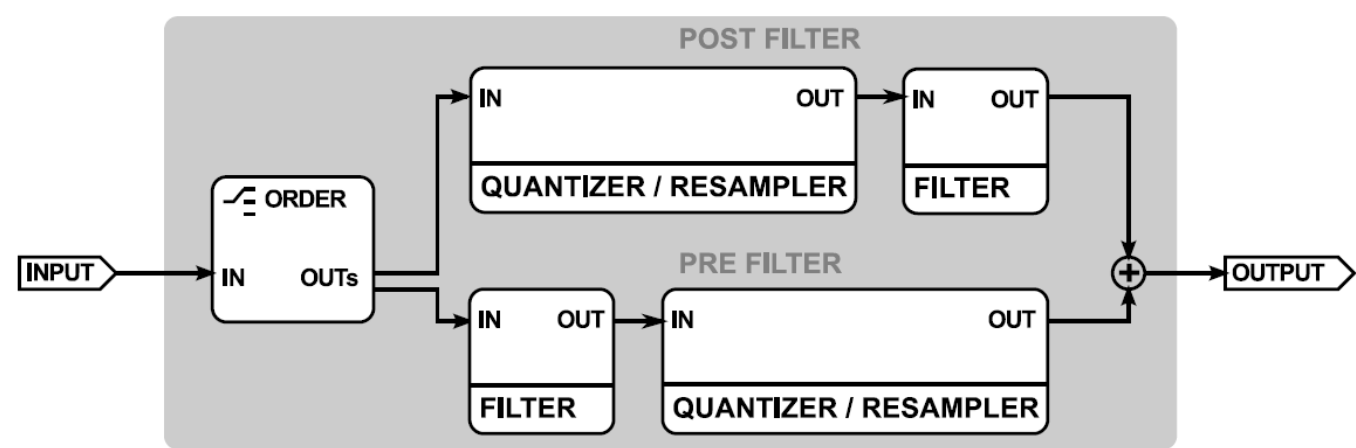
Signal flow through quantizer / resampler and filter only

Preset Management

Preset storage
Presets, both from Factory content and user ones, are stored as files in proper locations on the disc. Each time a plug-in instance is loaded into a project, these locations are scanned and the presets found there are consolidated into a single linear structure (list) in the Preset Browser.

Browsing presets
The Preset management section (no matter what kind of preset it concerns) enables quick navigation and browsing of the preset structure:
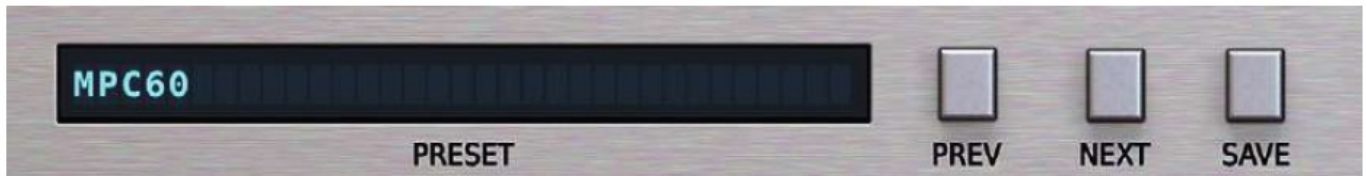
The Preset management section

- PRESET – Displays the name of the currently loaded preset. Clicking the display opens the Preset Browser panel, allowing you to browse factory/user presets.
- Prev / Next – Hovering over the right side of the Preset display exposes the Prev / Next buttons:
- They allow for linear browsing of the presets list (depending on currently set filters – see sections below).
- Save ▶ – Saves current parameters as a new preset or allows for overwriting of the existing one (see sections below).

Right-clicking over the Preset display opens a context menu with two or three additional options:

- Init – Restores initial settings of plug-in parameters.
- Reload – Reloads the most recently loaded preset.
- Save ▶ – See description above.

The Preset Browser looks as follows:
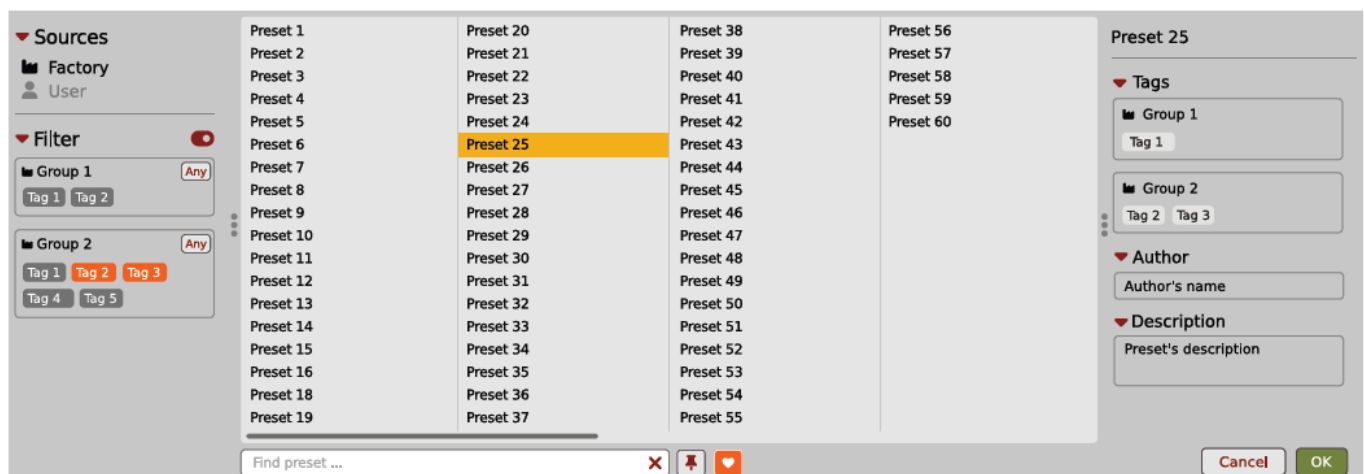
The Preset Browser

There are four main parts:

- Sources – Situated in the left column, filter content Sources for displayed presets.
- Filter – Below Sources, a preset Filter that uses the Tags system.

- Results – List of presets (shown in the middle column) from Sources that meet criteria set in the Filter.
- Info pane – The right column shows information about the currently selected preset(s), divided into several subsections.
- ▶️If available – For some preset types this button can be hidden and accessible from the contextual menu (accessible via right mouse-click on Preset display)
- ▶️If available

Sources
In this section, you can choose a Source / Source(s) that you want to browse presets from.
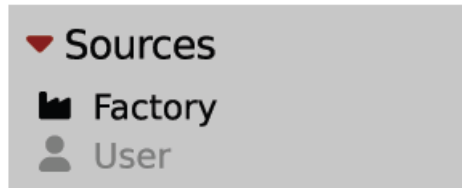
Preset Sources

There are two resources to choose from:

- Factory – Delivered together with the plug-in and cannot be modified (read-only).
- User – Created by the user and can be freely modified or shared with other users.
- Choosing any of them will cause the results to narrow to the presets from one resource.

Filter
The section below is the Filter, which represents a preset filtering system using Groups and Tags to browse the content.
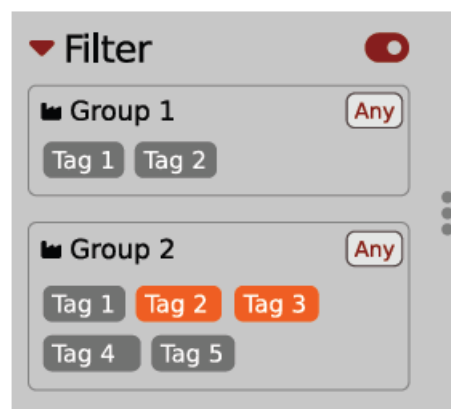
The Filter section

Groups and tags
Each Preset is described by a few common Groups. Within each of them, there may be one or more Tags from a particular set.
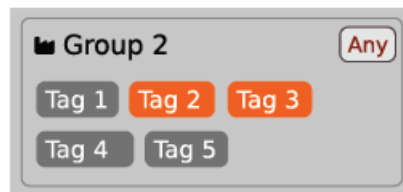
The Filter group

- Presets from the Factory resource were assigned Groups and Tags when they were created.
- Groups and Tags describe the content clearly, taking into account the plug-in's purpose.
- Editing of the Groups and Tags for Factory content is limited. User presets can be described with the same Groups and Tags as Factory content, or you may define additional Tags within factory Groups and even create your Groups with your Tags to describe your own presets.
- The only limitation is that a user cannot remove factory Groups or Tags from Factory content.

Results

This is a list of presets from chosen Sources that meet the filtering criteria. The basic function of this section is to browse and load presets. It can also be used for editing, which is described later.

The Results list

- Click any name to choose and load the preset.
- Double-click the name to choose, load the preset, and close the browser.
- Hitting the OK button confirms loading a preset and closes the browser. Using Cancel closes the browser but reverts all parameter changes that loading a new preset might have caused.

Preset 47
Preset 48
Preset 49
Preset 50
Preset 51
Preset 52
Preset 53
Preset 54
Preset 55

▼ Author

Author's name

▼ Description

Preset's description
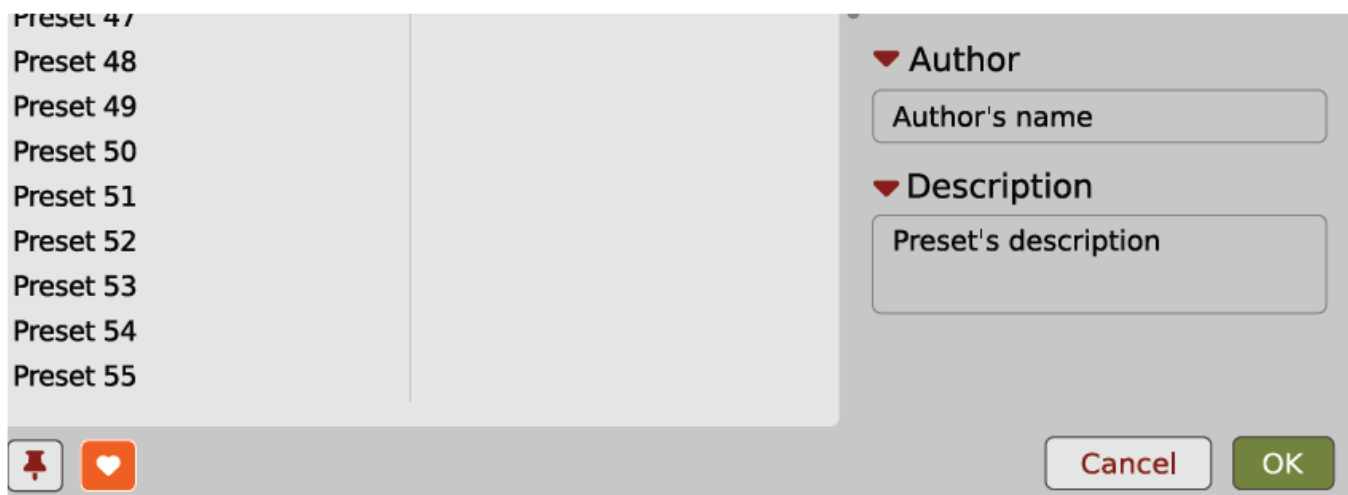
Cancel   OK

The OK and Cancel buttons in the browser

- Using the X icon has the same effect as the OK button:

Preset 38   Preset 56   Preset 25
Preset 39   Preset 57
Preset 40   Preset 58   ▼ Tags
Preset 41   Preset 59
Preset 42   Preset 60   Group 1
Preset 43   Tag 1
Preset 44
Preset 45   Group 2
Preset 46   Tag 2   Tag 3
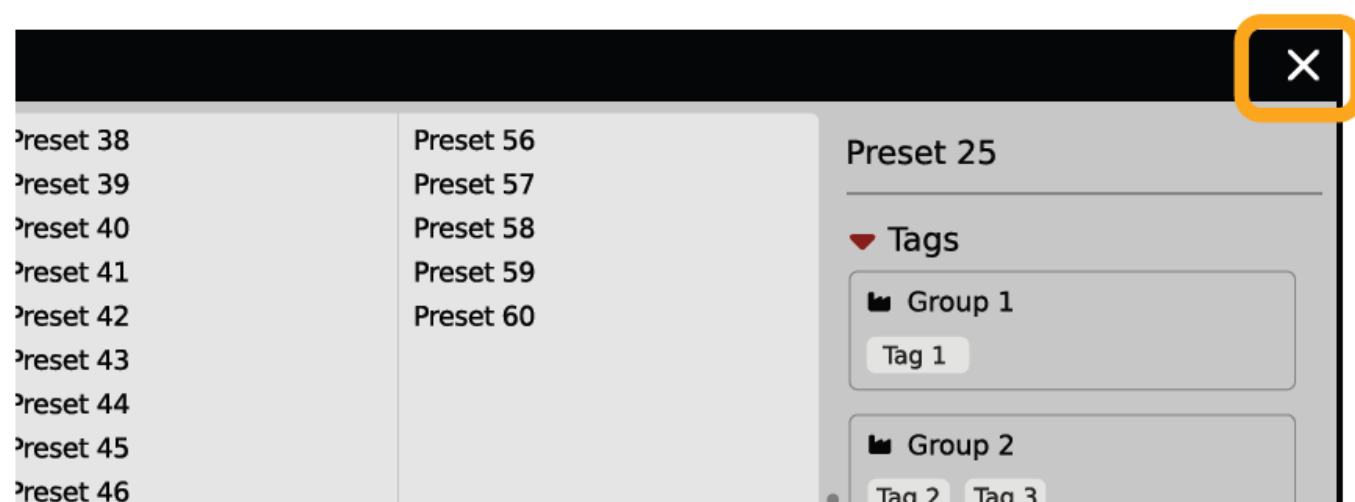
Close Browser window

Preset filtering using Groups and Tags
The Filter section contains Groups of Tags. Each Group is represented by a rectangle with the Group name + set of Tags inside.

Group 2   Any
Tag 1   Tag 2   Tag 3
Tag 4   Tag 5
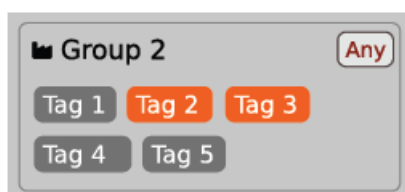
Group 2 with two tags set (Tag 2 and Tag 3)

The filtering process cascades from top to bottom. This means that all presets available in the selected Sources are filtered by selected Tags from the first Group (uppermost one), then the Group below, and so on, until filtered by the last active Group (the bottom one).
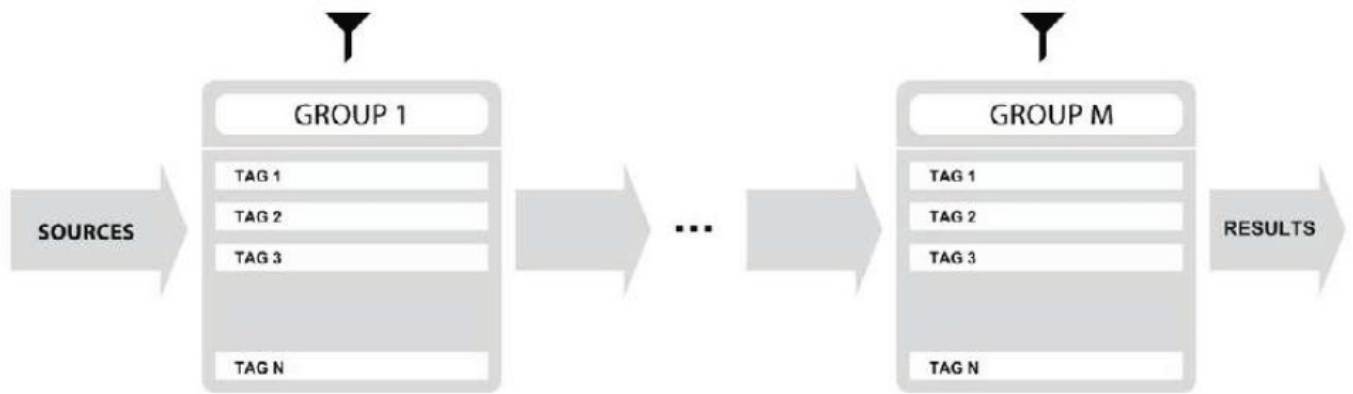
Preset Filtering with the use of Groups

The result of the cascade filtering process is listed in the middle column, the Results / presets list section. You can also consider the Results list as an intersection of preset sets, found by filtering through every individual Group.

Basic Actions

Tags work as toggle buttons. Click to activate/deactivate a Tag; a gray background color means that the Tag is inactive, and orange means that the Tag is active.
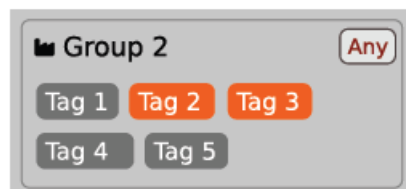

Group 2 with two tags set (Tag 2 and Tag 3)

If at least one Tag in a Group is active, then the Group (filter) also becomes active, otherwise, the Group chosen doesn't affect the filtering process at all.

Group operator

When a single Tag is active in a Group, only presets having that Tag set are displayed in the Results.
If two or more Tags in a Group are active, the Results depend on the Operator chosen for the Group:
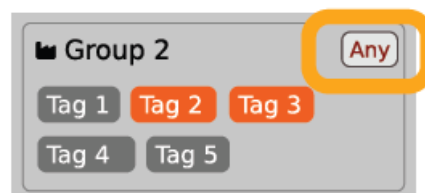
A Group operator

The Operator button works in toggle mode and offers a choice of two alternative Operators for the Group:

- Any – This means that a preset is shown in the Results when the preset includes at least one of the active Tags from the Group.

- All – This means that a preset is shown in the Results only when the preset includes all active Tags from the Group.

Filter enable/disable

You can quickly enable/disable the Filter using the toggle switch in the top-most section of the Filter:
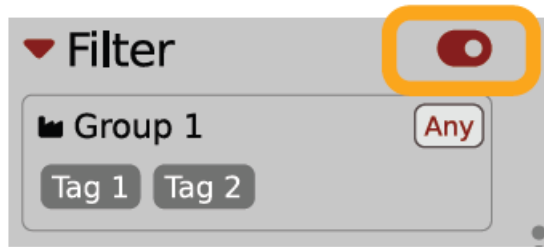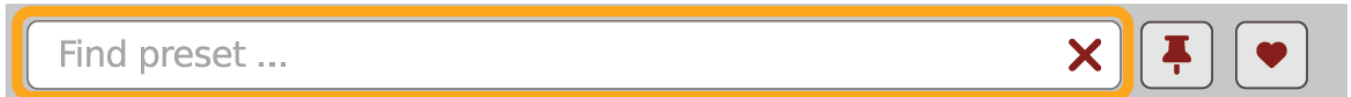
An On/Off switch for a Group Filter

Other types of filtering

Searching by name

Alternatively, you can look for a preset by entering its name or just a piece of its name into the Find preset field:

The Find preset input

- The Results are refreshed on-the-fly and they work together with the other filters.
- Using the X icon clears the entire field:

Clearing the search field

Filtering Favorite presets

You can mark presets as a Favorite by clicking the Heart icon while hovering over the preset name▶. You can unmark presets by clicking the icon again (toggle mode):

Setting a preset as a Favorite on the list

- ▶Logical OR between Tags in the Group

- ▶Logical AND between Tags in the Group

- ▶It's allowed for every source (factory or user)

- The flag is stored globally, meaning that a Favorite preset will be accessible as such from every other instance

  of the plug-in▶.

- Once you have your Favorite presets flagged, you can quickly filter them using the toggle button with a Heart

  icon on it:

Favorite presets filtering

If the button is active, then only Favorite presets will be shown (considering all remaining filters).

Filtering Pinned presets

You can Pin one or more presets using the Pin icon while hovering over a preset name. You can unpin a preset by clicking the icon again (toggle mode):

Pinning a preset on the list

- Unlike Favorites, this flag works locally and it's stored with the project file (not global config), so Pins are stored individually for every instance (with total recall, so a plug-in state is recalled if saved in the context of a project).

- But, similarly to Favorites, you can easily filter presets using the toggle button with the Pin symbol on it:

Pinned presets filtering

- If the button is active, then only Pinned presets will be shown (considering all remaining filters).

Info pane

The column to the right shows information about the selected preset or presets. It also provides access to some of the preset editing functions.
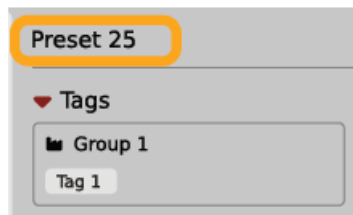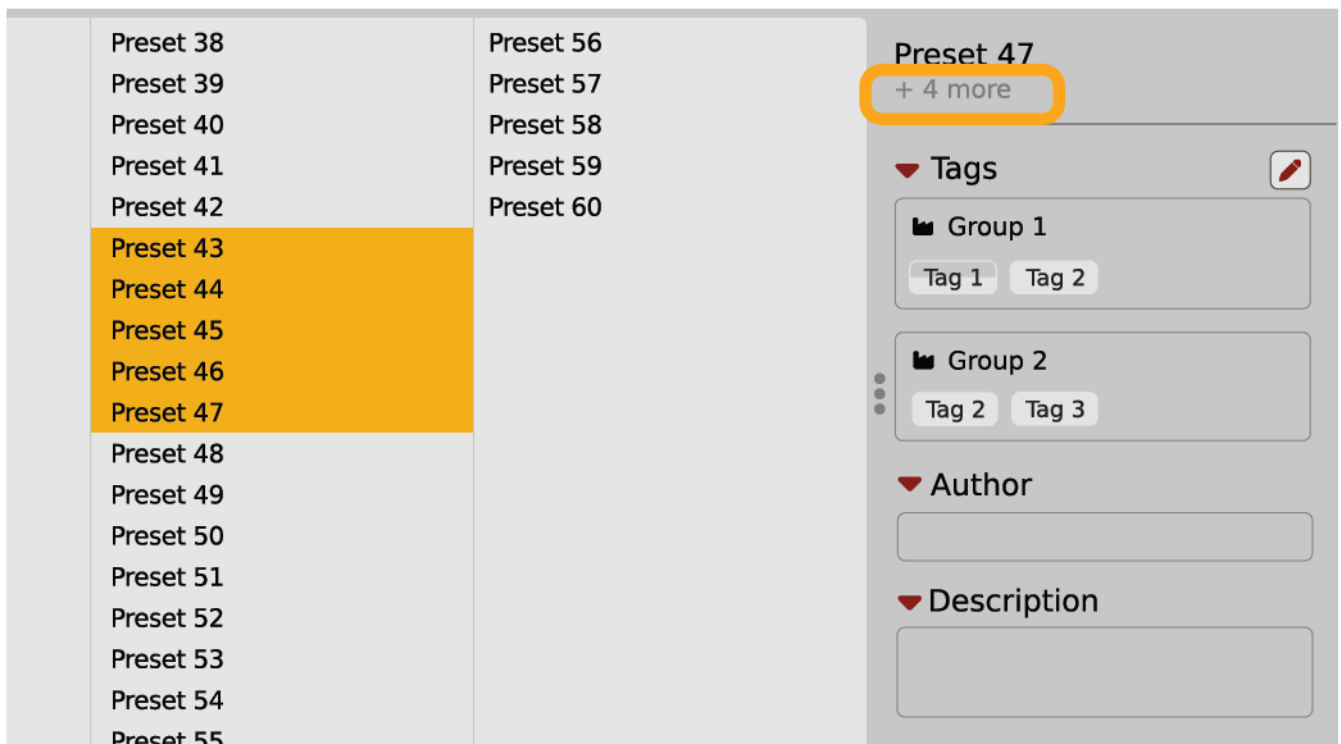

The Info pane

- There's a preset name at the top.

The Preset name in the Info pane

- Additionally, if you've selected more than one preset there's information about how many more have been selected:
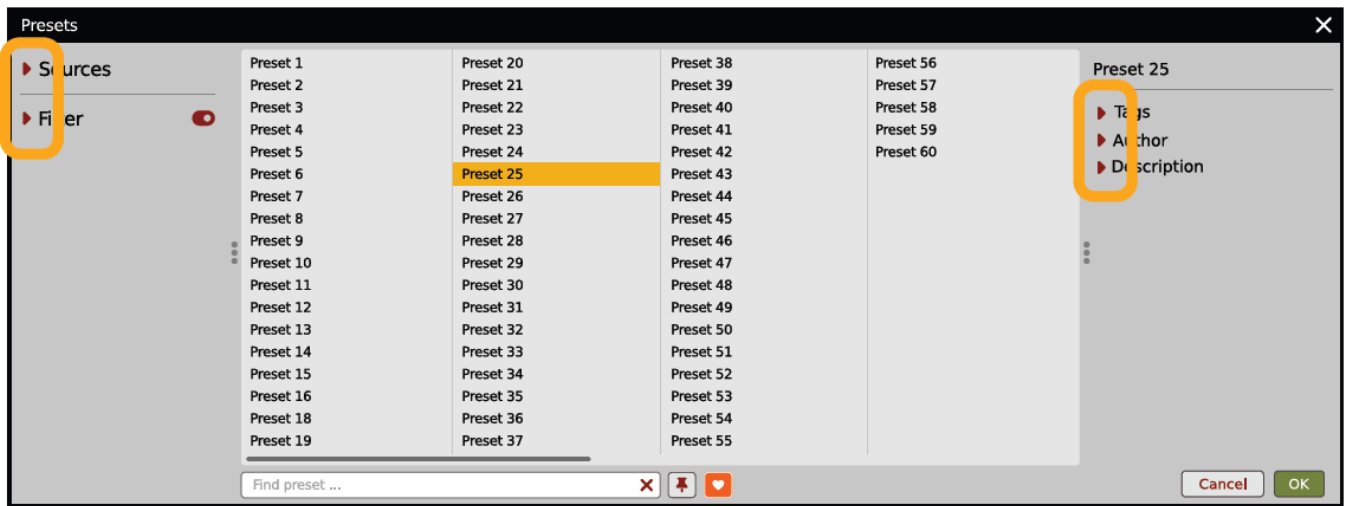

Selecting more than one preset

Below the preset(s) name there are a few common sections describing selected presets:

- Tags
- Author
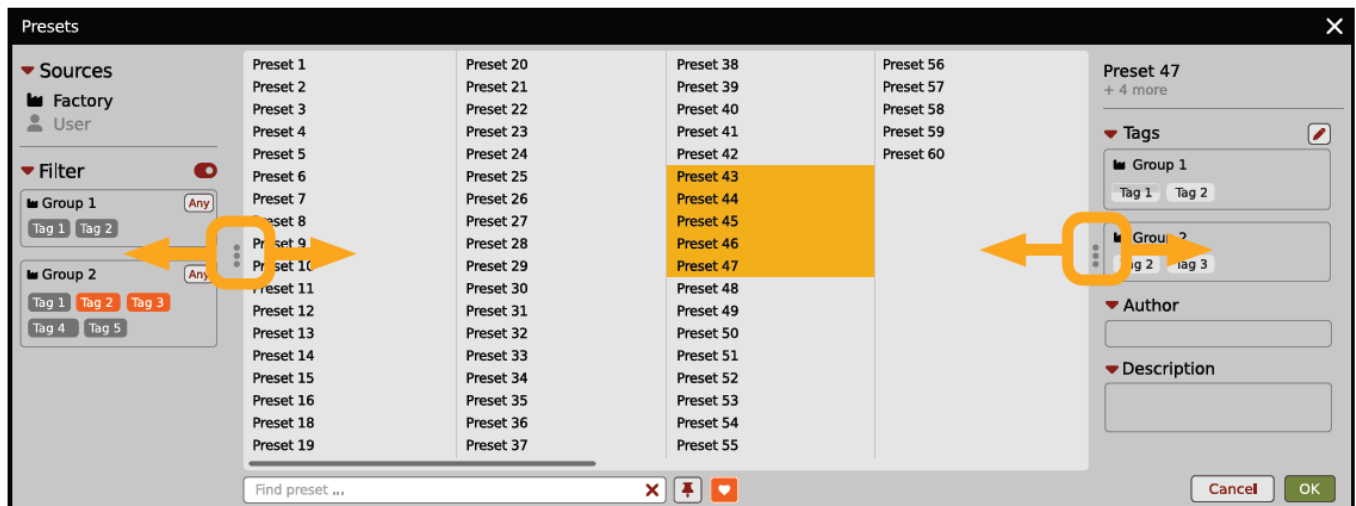- Description

Browser's visual adjustments
Folding sections
If you don't need to see the contents of every section/subsection, you can fold some of them up using the Caret icons:

Sections folded up

Resizing columns

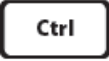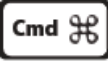You can use the three-dotted handles to change a column's width to your preference.


Resizing Browser columns

Editing presets

You can perform certain actions on presets, such as adjusting Groups and Tags, deletion, and renaming the presets as well as their export or import. One should bear in mind, however, that some operations are only allowed on user presets but not on Factory content.

Preset selection for Edit

Some operations can be done on more than one preset, so you're allowed to select more than one preset at once; in the Results section, you can choose a preset or a set of presets in the following ways:

- Click a preset – Select (and load) one preset from the list.

- Win (**Ctrl** + Click the preset), Mac (**Cmd ⌘** + Click the preset) – Adds another preset to an already chosen preset or a set of presets.

- Shift + Click the preset – Select a range of presets from the last chosen preset to the preset clicked with the Shift key.

- Right-click on any Preset in the Results section and choose the Select All option – this selects all presets:
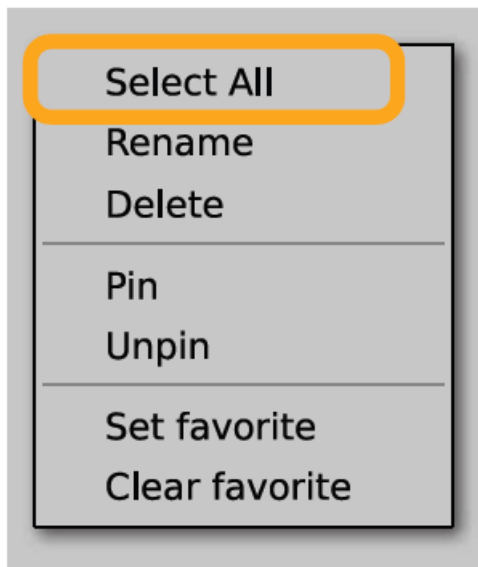
Selecting all presets

Preset renaming

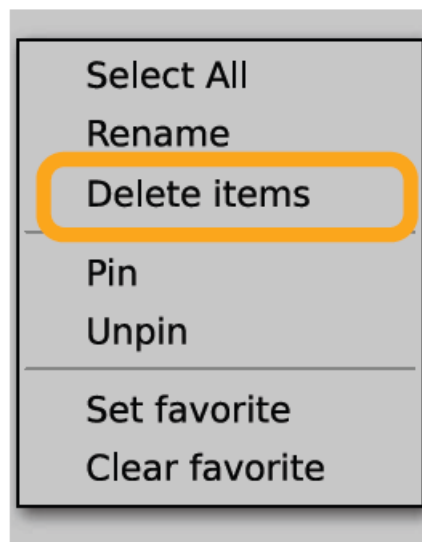On a selected preset, right-click to open the context menu and select the Rename option:
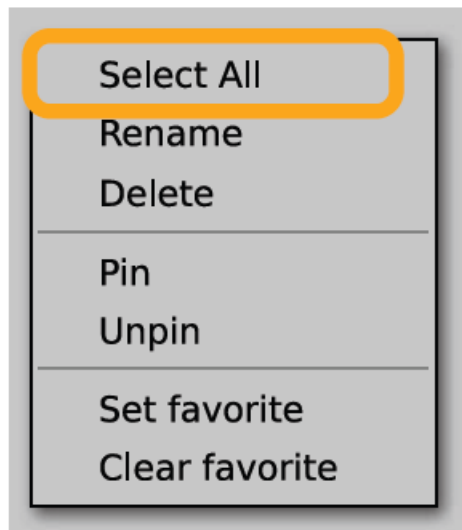
Preset renaming

Preset deletion

Once you have selected one or more presets, right-click to open the context menu and select the Delete items

 option:

Deleting presets

- Alternatively, you can use the Trash bin button in the Info pane to delete selected presets:
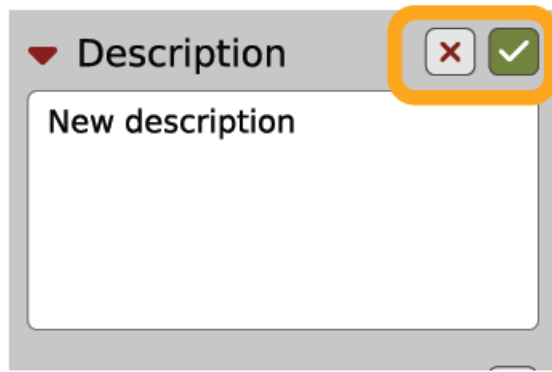

The Trash bin button

Tags editing

When you select a preset or presets to change their tags, click the Pencil button next to the Tags section in the Info pane to enter Edit mode for the Tags:


Entering the Tag edit mode

- With the Edit mode enabled, you will see all possible Groups and Tags available for the preset(s):

Confirming Description editing

- Tag buttons work in toggle mode, much like filtering. Clicking them either sets or erases a Tag for a chosen preset. If a Tag is set for a preset, it is indicated by an orange background color, whereas if a Tag is not set, it has a gray background color.
- If you choose multiple presets with existing tags, Tag buttons will appear orange if a specific Tag appears in all selected presets, and gray if it appears in none.
- When a specific Tag is set only for a few of the selected presets, it appears as half-gray and half-orange.
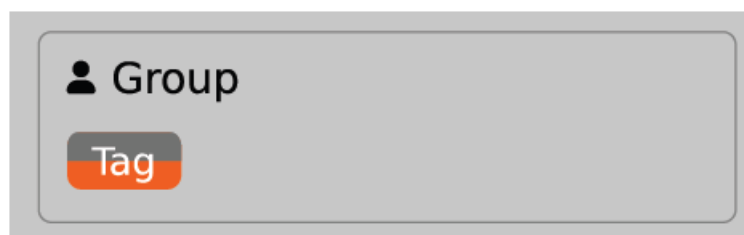
Tags appearing only in part of selection

- Changing the Tag status for one or more chosen presets sets or erases this Tag in all these presets. A status change is signaled by an Asterisk to the left of a Tag.

A Tag with a status change

- Tag buttons highlighted in half-gray and half-orange color (where Tag values across the highlighted preset aren't all the same) work a three-state system when switching between states; they turn gray if you erase the Tag for all selected presets, orange if you set the Tag for all selected presets, and return to half-gray and half-orange if the selected items remain unchanged or are returned to their initial state.
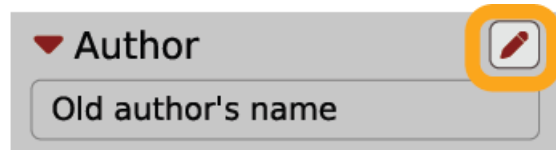- Potential changes have to be confirmed using the OK / Cancel buttons at the top part of the Tags section:

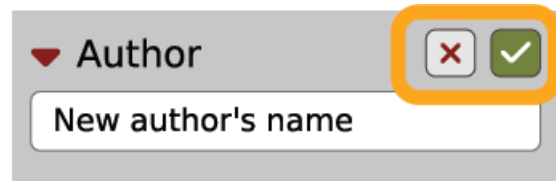Confirmation buttons in the Tags section

Author editing

When you select a preset or presets to change the Author, click the Pencil button next to the Author section in the Info pane to enter the Edit mode for the Author field:

Editing Author

- Once you've finished editing the field, confirm the operation using the OK / Cancel buttons:
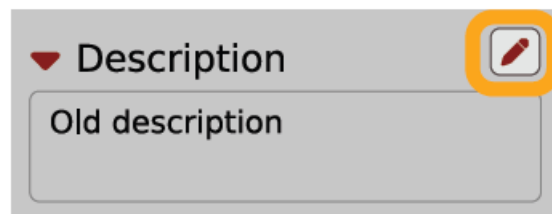
Confirming Author editing

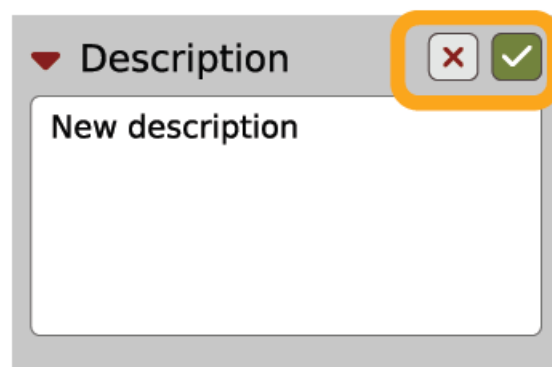- This operation is possible for user content only.

Description editing

When you select a preset or presets to change the Description, click the Pencil button next to the Description section in the Info pane to enter the Edit mode for the Description field:

Editing Description

- Once you've finished editing the field, confirm the operation using the OK / Cancel buttons:

Confirming Description editing

- This operation is possible for user content only.

Setting presets as Favorites

As described in the chapters above, you can mark a preset as a Favorite by clicking the Heart icon while hovering over the preset name.

Setting a preset as a Favorite

- The flag is stored globally, meaning that a Favorite preset will be accessible as such from every other instance of the plug-in .

- It's also possible to operate for a selection of presets. After you select the desired presets in the Results window, right-click on the presets to open a context menu:
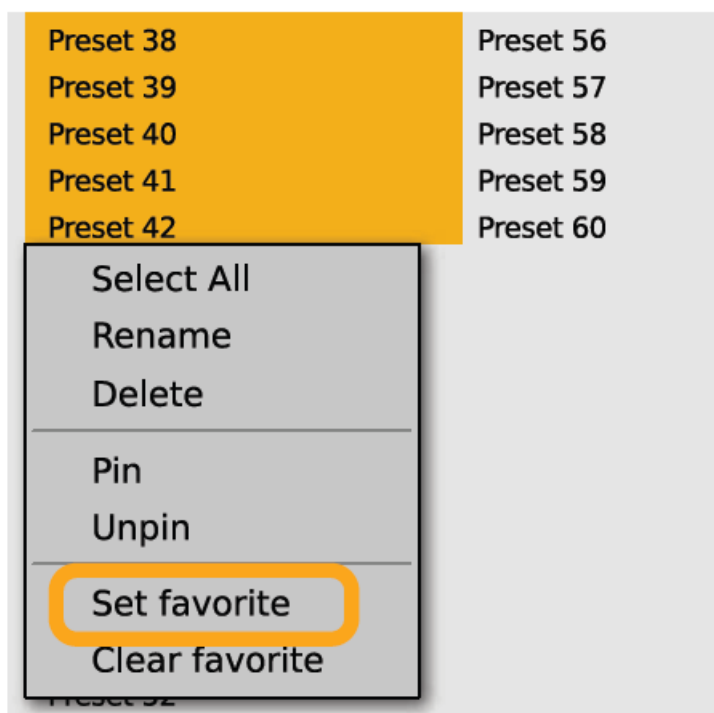
Setting Favorite presets from the context menu

Select the Set Favorite option.
To clear Favorite flags for the selection of presets, use the Clear favorite option instead.
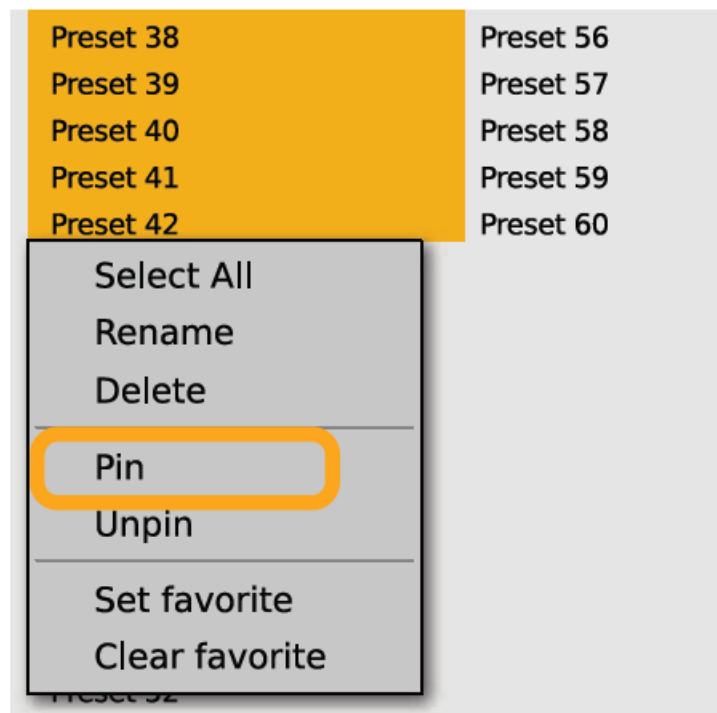
Pinning presets

You can Pin one or more presets using the Pin icon while hovering over the preset name:

Pinning a preset

- Unlike Favorites, this flag works locally and it's stored with the project file (not globally). This means the Pins are stored individually for every instance (with total recall, so a plug-in state is recalled if saved in the context of a project).
- It's also possible to operate for a selection of presets. After selecting the desired presets in the Results window, right-click on the presets list to open the context menu:

*Pinning presets from selection*

Select the Pin option.
To clear the Pin flag for a selection of presets, use the Unpin option instead.
Preset exchange
If you want to make a backup or exchange a preset with a collaborator, you can export / import selected presets.

Export
Select a preset or presets that you're going to export and drag-and-drop them outside your DAW into a location you'd like to store them:
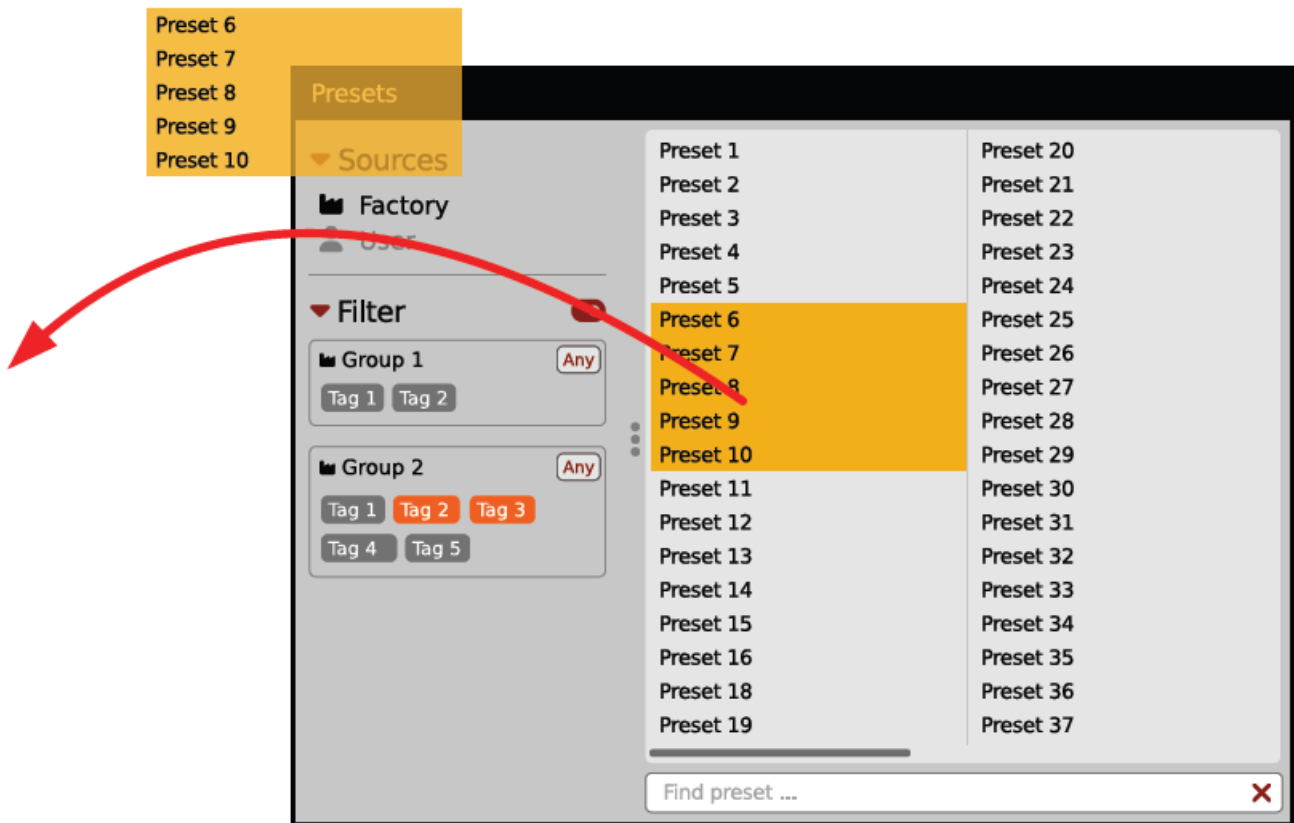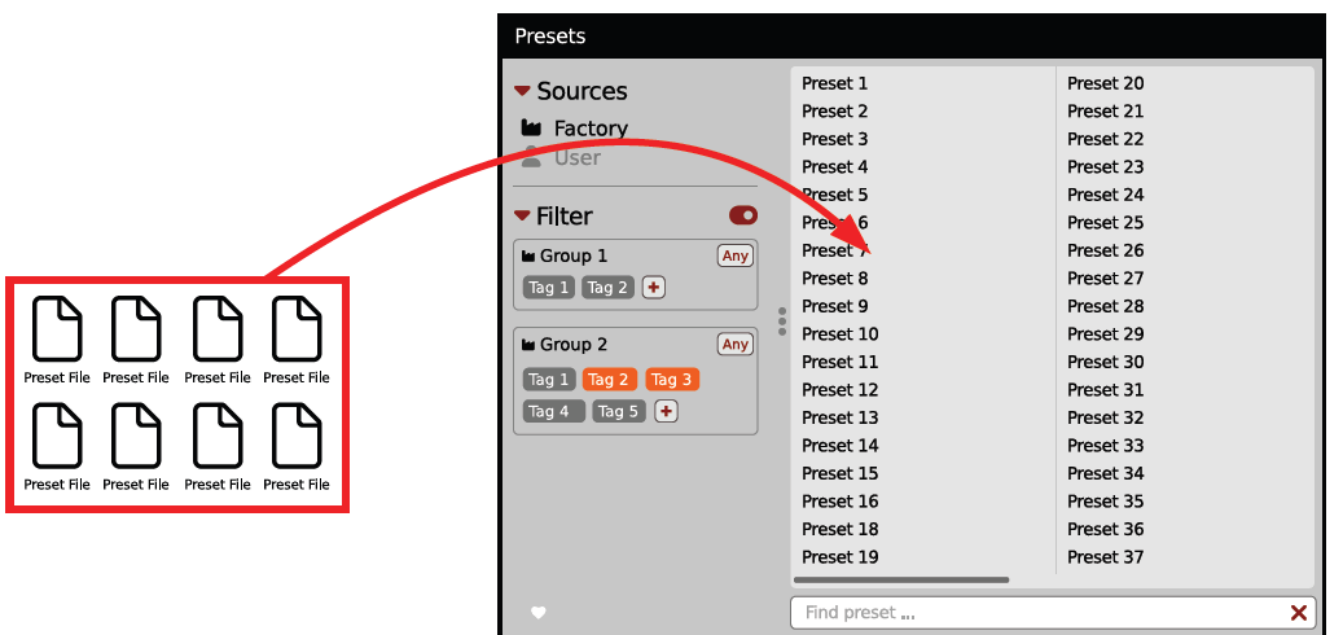
Exporting presets

The presets will be saved as individual files (one per preset) in the plug-in's native format.

Import
If you'd like to import preset files, you can drag-and-drop preset files from where they're stored, into the preset browser:

Importing presets

- They will be automatically imported as user presets.

Importing Patterns

- Specifically within the Pattern browser, it's possible to import:
- Native Phoscyon 2 patterns.
- Banks from legacy versions of the plug-in (Phoscyon 1. x) – which will be accessible as alternative Sources, after you drag and drop them into the Browser.
- Patterns from Audiorealism ABL 2 or 3 instruments – which will be included in User patterns after import.

Creating custom Tags and Groups structure

Adding custom tags

Users are allowed to add their custom Tags to both their own content and factory content. To add a new Tag to an existing filter Group, click over the Group's name to pull down a menu and select the Add Tag option :
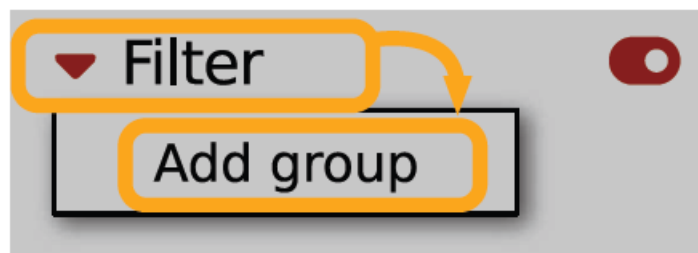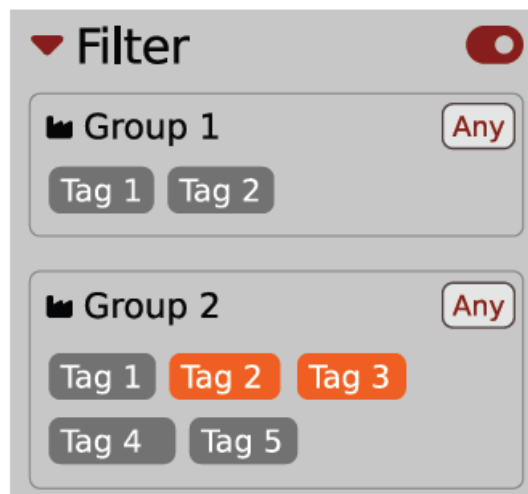

Adding a user Group

- You can do this either in the Info Pane (right column, while the Tag edit mode is enabled) or Filter (left column).
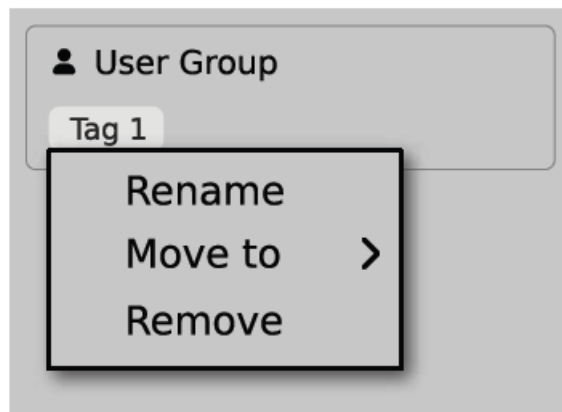
Editing custom Tags
There are a few edit options available for a user to perform on their Tags, which are available by right-clicking a Tag's name in the Filter section:

The Filter section

- You will see a context menu with all the available options:

Editing options for a user Tag

- Rename – Changes the name of a Tag.
- Move to – Moves a Tag to another Group.
- Remove – Deletes a Tag.

The menu is accessible only for a user's Tags.

Adding custom Groups
You can add a custom filter to Groups by clicking the Filter label and selecting the Add Group option from the pull-down menu:
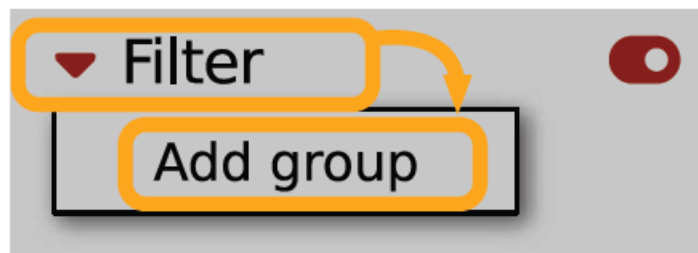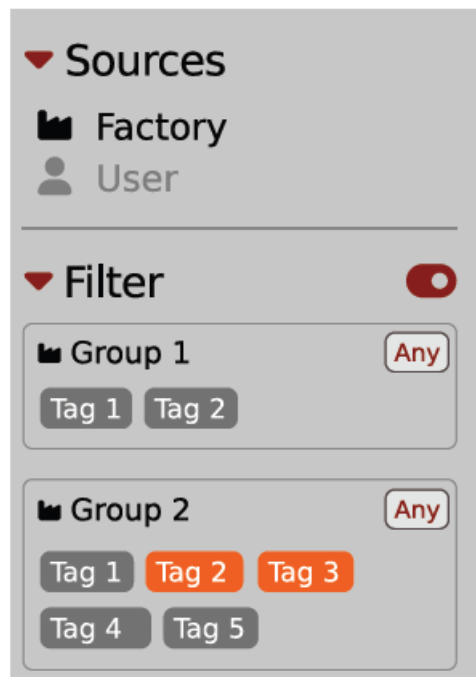

Adding a user Group

- From here, you can add Tags to that newly created Group (see above), or move Tags from other Groups.
- You can also add a custom filter to Groups in the Info Pane (right column) or Filter (left column).
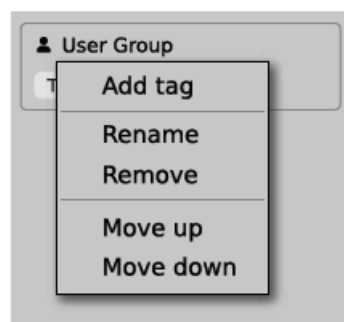
Editing custom Groups
There are a few edit options available for a user to perform on their Groups. Click on a Group's name in the Filter section:

The Filter section

- You will see a context menu with the following options:

Edit options for a user Group

- Add Tag – Adds a new tag to the Group (described earlier).
- Rename – Changes the Group's name.
- Remove – Deletes the Group, possible only when all Tags in the Group have also been removed.
- Move up – Moves a Group up in the Filter. Possible unless the Group is already the topmost one.
- Move down – Moves a Group down in the Filter. Possible unless the Group is the last one.

These operations are possible only in user Groups.
Groups in the Filter are ordered with Groups from Factory content first, then user groups below.
You can edit user Groups in either the Info Pane (right column, while Edit mode for Tags is enabled) or Filter (left column).

Unassigned Tags
When you receive content from a collaborator who uses different Tags and Groups, some Tags may show as Unassigned. This happens if the filter structure made by a preset's author is different.
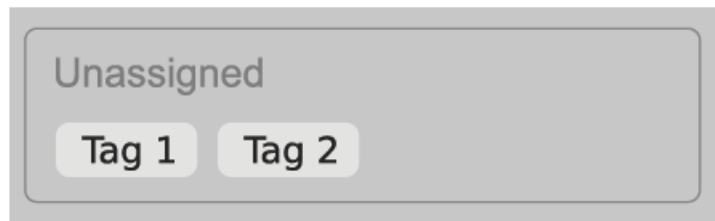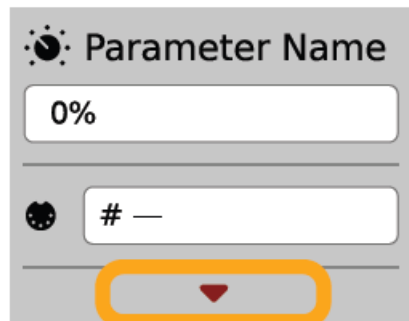
Unassigned Tags

- You can move the Tags across your Groups to make them fit your scheme, or re-tag the collaborator content entirely.
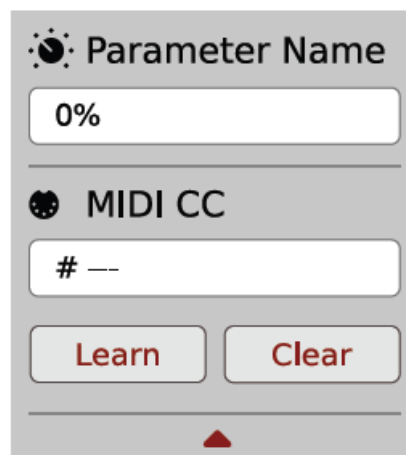
Configuration

MIDI Learn
Right-click any plug-in parameter to open the context menu:

A context menu

- Left-clicking outside the menu area closes it automatically.
- Clicking the bottom arrow expands the menu and displays all available options:

An expanded context menu

Linking a parameter to MIDI CC
The Learn function enables a quick assignment of physical controllers (from a MIDI controller) to plug-in parameters.

1. Click the Learn button to put the plug-in into a pending state before moving any MIDI CC controller.
2. Once the CC is recognized, click OK to save the change or click the Cancel button to restore the previous
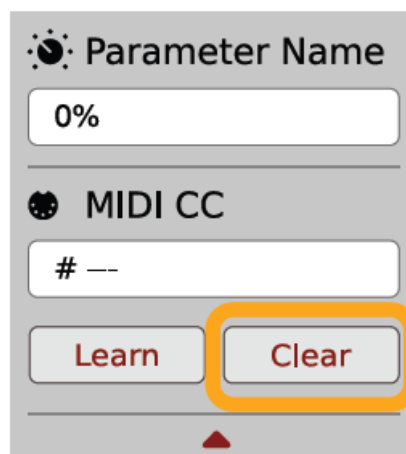
setting.
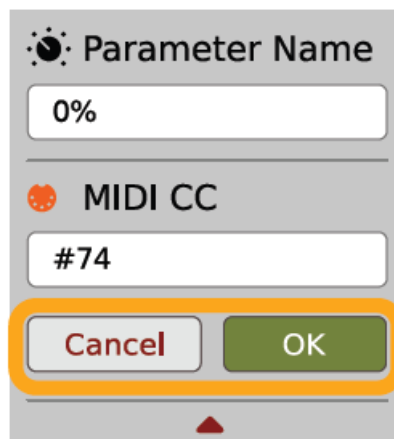
Linking a parameter to MIDI CC

Unlinking a parameter from MIDI CC
You can also delete a MIDI CC code attributed to a parameter from the context menu:

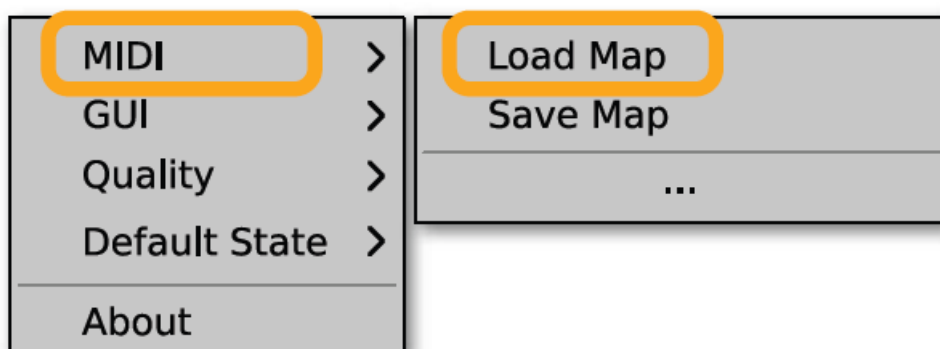1. From the context menu, click the Clear button:

The Clear MIDI CC button

2. Then confirm using the OK button.

Loading / Saving a MIDI CC Map
These options are available in the MIDI submenu, accessible under the Cog icon in the left-upper corner:

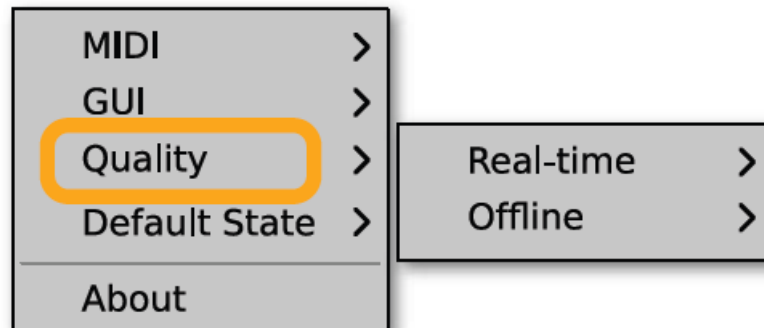

The Load Map and Save Map options

- Save Map – Saves the current MIDI CC map to a file.
- Load Map – Loads a MIDI CC map from a stored file.

Quality settings

The Quality submenu under the Cog icon in the upper-left corner allows you to choose sound quality for Real-time or Offline modes.
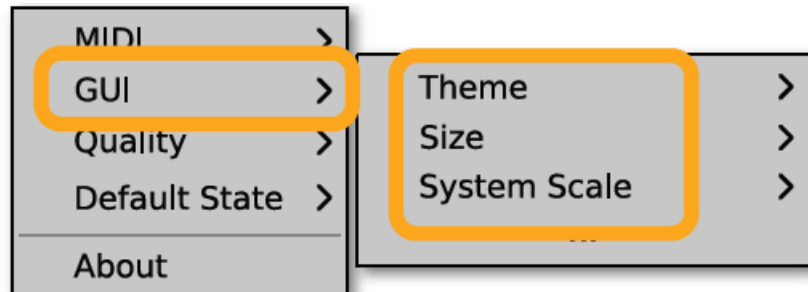

Quality settings

The higher the quality, the bigger the impact on the CPU.

GUI

The Size, System Scale, and Theme options are accessible from the GUI submenu under the Cog icon in the upper-left corner of the plug-in. With these, you can adjust the look of the plug-in, according to the pixel density and resolution of your screen:

The GUI Size and System Scale options

Size

This option lets you choose one of several default skin sizes to best match the plugin to the resolution of your computer monitor.

System Scale

System Scale controls the rescale factor for the whole plug-in. For the best visual results, you should set it to the exact value from your system settings (screen properties).

Theme

The Theme allows you to choose skin color variants according to your preference

Default Settings

You can save your current settings so that the plug-in will default to them for each new instance, or restore the plug-in to load with its factory settings.

Changing default settings

1. Click the Cog icon in the left upper corner of the plugin.
2. Go to the Default State submenu and choose the Save current option.
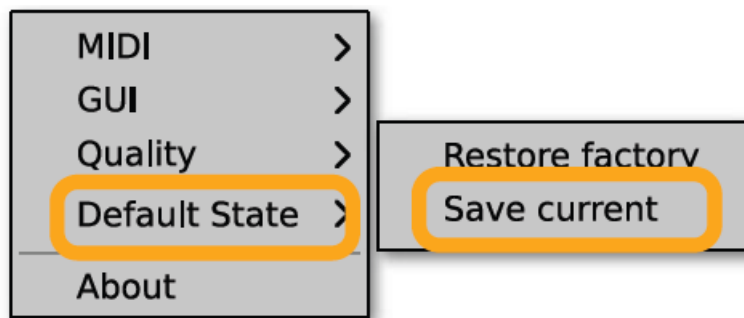
Changing the default state of the plug-in

- With this option, the current plug-in state will be saved as the default / initial state for when you insert a new instance of the plug-in.
- The plug-in state includes sound parameters (default preset), views, preset filters, sound quality settings, loaded/created MIDI CC map, and GUI settings.

Restoring factory defaults

To return the default state for new instances to factory settings:

1. Click the Cog icon in the left upper corner of the plugin.
2. Go to the Default State submenu and choose the Restore Factory option.

Thanks
Goes to:
Ariel Proksa – ArxProAudio – For contributing some presets to the Factory Content.
Laurent Bergman – For his help with preparing French versions of manuals for D16 products.

Documents / Resources

d16 group Decimort 2 High Quality Bit Crusher [pdf] User Manual
Decimort 2 High Quality Bit Crusher, Decimort 2, High Quality Bit Crusher, Quality Bit Crusher, Bit Crusher, Crusher

References

- **User Manual**