



d16 group
AUDIO SOFTWARE

FAZORTAN2

CONTROLLABLE SPACE PHASER



User Manual

Requirements

Software and hardware requirements



Windows PC

OS version	Window 7, Windows 8, Windows 10
CPU	2GHz with SSE (2.5GHz multicore system recommended)
RAM	8 GB (16 GB recommended)
Software	VST2 / VST3 / AAX compatible host application (32bit or 64bit)



Mac OS X

OS version	OS X 10.9 or newer
CPU	Intel-based 2GHz (2.5GHz recommended)
RAM	8 GB (16 GB recommended)
Software	AU / VST2 / VST3 / AAX compatible host application (64bit!)

Overview

Fazortan 2 is a dual-LFO phaser effect.



Fazortan 2 graphical interface

The plugin interface comprises two main sections:

- **Configuration and preset management** (the top-most section)



Configuration and preset management section

- **Signal processing** (all remaining controls)

Signal flow

In this chapter, we'll describe the signal path through **Fazortan 2**, and explain each component and its controls along the way.

Basic modules

Fazortan 2's signal processing components are organised into separate sections in the graphical user interface:

Phase shifter

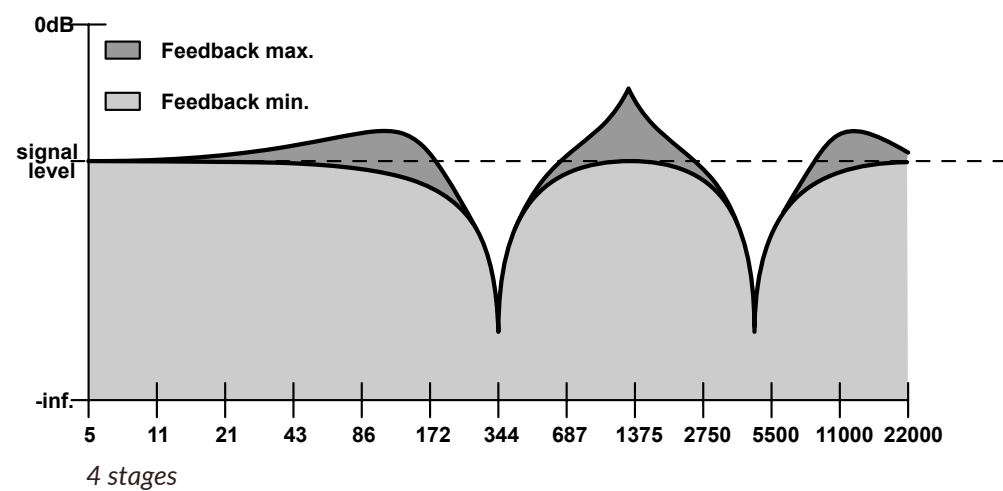
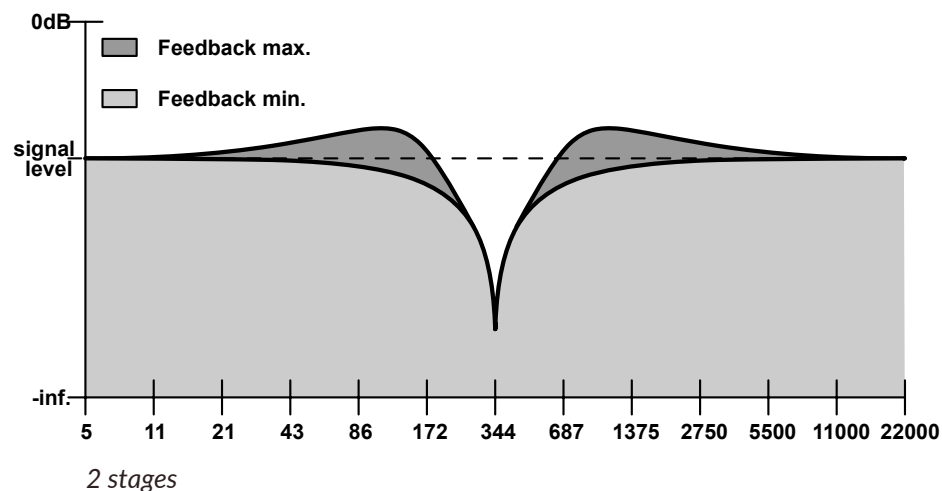
At the heart of **Fazortan 2**, the phase shifter applies an all-pass filter to the input signal to generate a phasing effect. The frequency response of this filter can be thought of as like a series of notch filters with cutoff frequencies evenly spread across the spectrum. The **Phase shifter** is controlled in the **Phaser** section of the GUI:

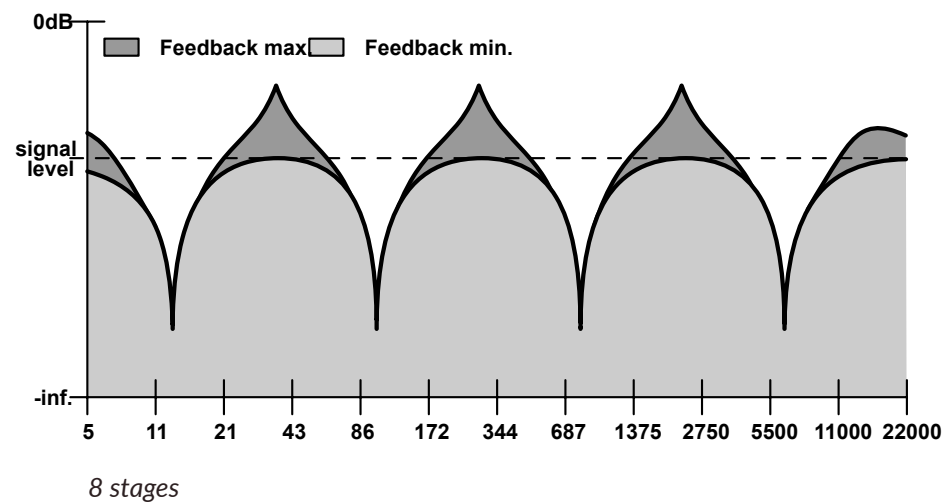
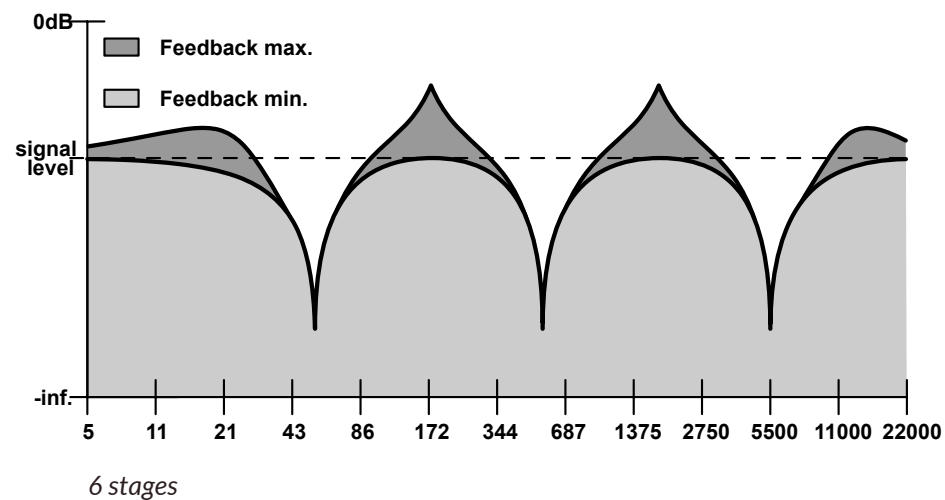


The Phaser section

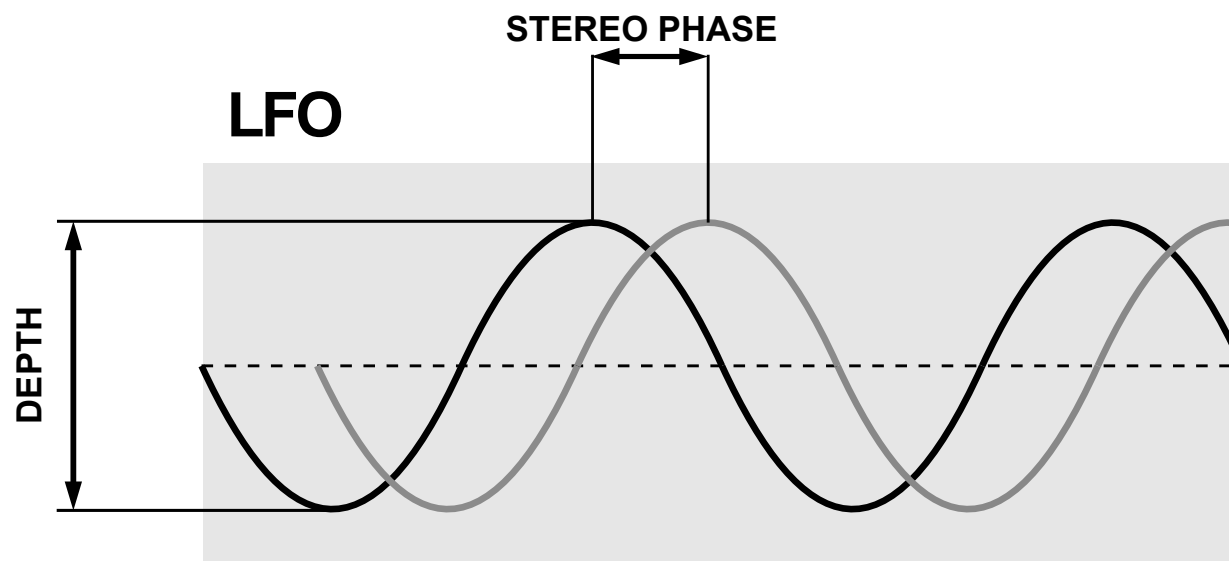
The **Phaser** section houses the following controls:

- **Stages** – Set the number of all-pass filters (**Stages**) making up the **Phase shifter** to **2, 4, 6** or **8**. The frequency responses of the phasing filter for all four options are illustrated below:





- **Center Frq.** - The **Phase shifter** stages (2, 4, 6 or 8) are evenly spread across the frequency spectrum, with the center point between them determining the main *operational* frequency. The **Center Frequency** control shifts that operational frequency up and down the spectrum, and can be modulated by **Fazortan 2**'s two **LFOs** (*Low Frequency Oscillators*).
- **Feedback** - Route the **Phase shifter** output back into its input to emphasise the frequencies around the all-pass filter stage cutoff points.
- **Stereo phase** - The mixed waveform output by **Fazortan 2**'s two **LFOs** is stereo, and the **Stereo Phase** parameter applies phase shifting between the left and right channels.



LFO phase shift between stereo channels

When **Stereo Phase** is at **0**, the *left* and *right* **LFO** waves are 100% in phase. As the **Stereo phase** knob is turned clockwise, the phases of the two channels begin to separate, the difference between them increasing as the parameter is raised. The result is obvious widening of the stereo effect.

LFO – Low Frequency Oscillator

Fazortan 2 features two *Low Frequency Oscillators*, the mixed output of which is used to modulate the **Center Frequency** of the **Phase Shifter**.



Low Frequency Oscillator

The two LFO sections are identical and comprise the following controls:

- **Waveform** – Choose one of seven waveform shapes: *triangle, sinus, hyper-triangle, sawtooth ascending, sawtooth descending, square and sample/hold*.
- **Rate** – Adjust the frequency of the **LFO**, from 0.01 Hz to 20 Hz with **Sync** disengaged.
- **Sync** – Engage to synchronize the **LFO** to the tempo set in the host application.
- **Scale** – Set the note value modifier for tempo synchronization mode (with the **Sync** button engaged):
 - **Full** – The **LFO** period length is equal to the note value set by the **Rate** knob at the host tempo.
 - **Dotted** – The **LFO** period length is equal to the dotted note value set by the **Rate** knob at the host tempo.
 - **Triplet** – The **LFO** period length is equal to the triplet note value set by the **Rate** knob at the host tempo.

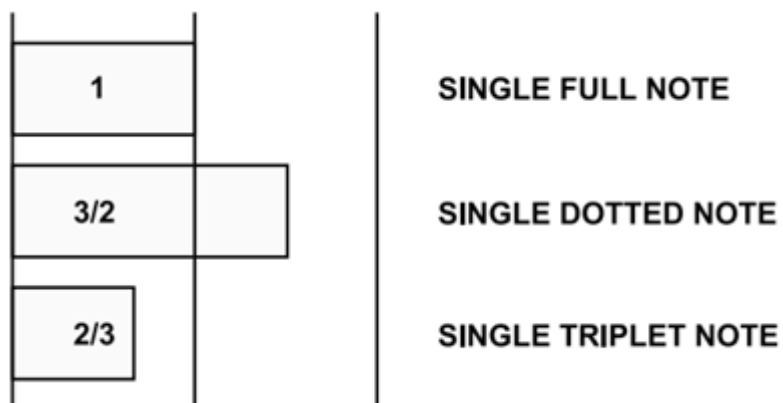
SIGNAL FLOW • BASIC MODULES

When **Sync** is engaged, the **LFO Rate** can be set to one of the following values: **1, 2, 4, 8** or **16** bars; half note ($\frac{1}{2}$), quarter note ($\frac{1}{4}$), eighth note ($\frac{1}{8}$), 16th note ($\frac{1}{16}$) or 32nd note ($\frac{1}{32}$).



One bar

A **Dotted** note is half a note longer than a **Full** note, while a **Triplet** note is two thirds the length of a **Full** note.



Note lengths

The waveforms generated by **Fazortan 2**'s two **LFO** modules are mixed (added) together, and the resultant oscillation modulates the operational frequency (**Center Frq.** parameter) of the **Phase shifter**.

Sweep section

The **Sweep** controls govern the amplitudes of the waveforms generated by **LFO1** and **LFO2**:



The Sweep section

The **LFO 1 Depth** and **LFO 2 Depth** controls set the amount of effect that the oscillations of each **LFO** have on the **Phase shifter's** center frequency.

Master section

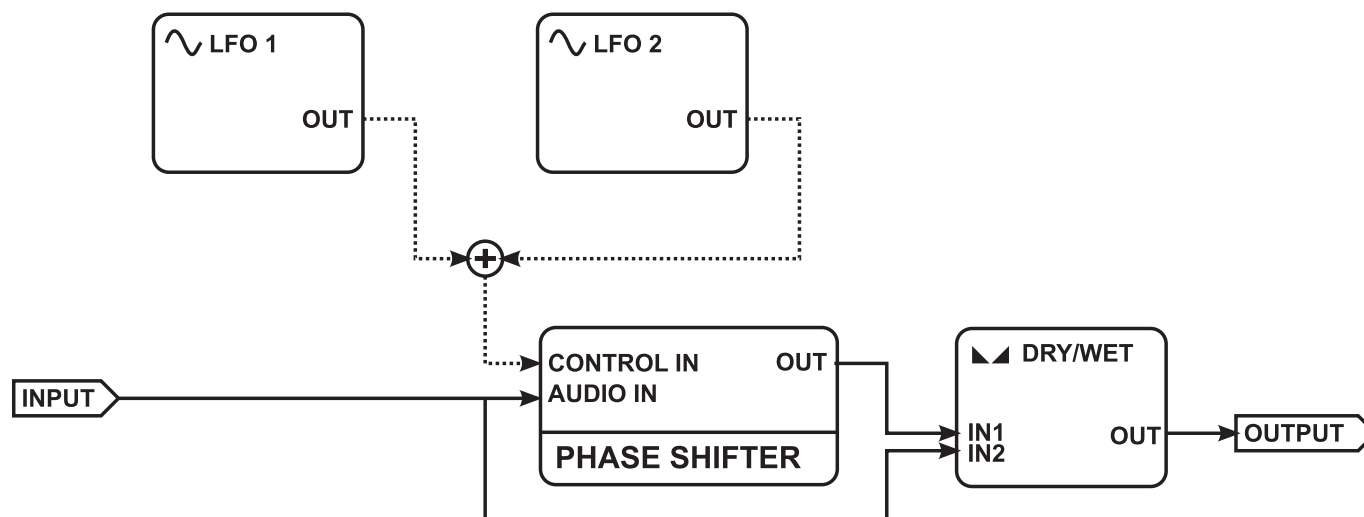
At the end of the signal flow, the **FX** knob controls the balance of processed/unprocessed sound sent to the output, while **Output Volume** determines the final amplification level.



The Master section

The signal path

The diagram below shows the signal flow through **Fazortan 2**:



Signal flow

In summary, the signal is duplicated immediately after the input and sent down two paths: one goes to the **Phase shifter**, the other goes straight to the output on the '**Dry**' channel. The operational frequency (**Center Frq.**) of the all-pass filter in the **Phase shifter** is modulated by the two **LFOs**. At the end of the signal path, the processed (**Wet**) and unprocessed (**Dry**) signals are mixed using the **FX** knob.

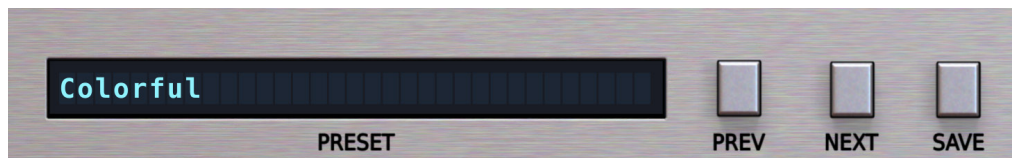
Preset Management

Preset Storage

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

Browsing Presets

Presets Configuration and Management section enables quick navigation and browsing the presets structure:



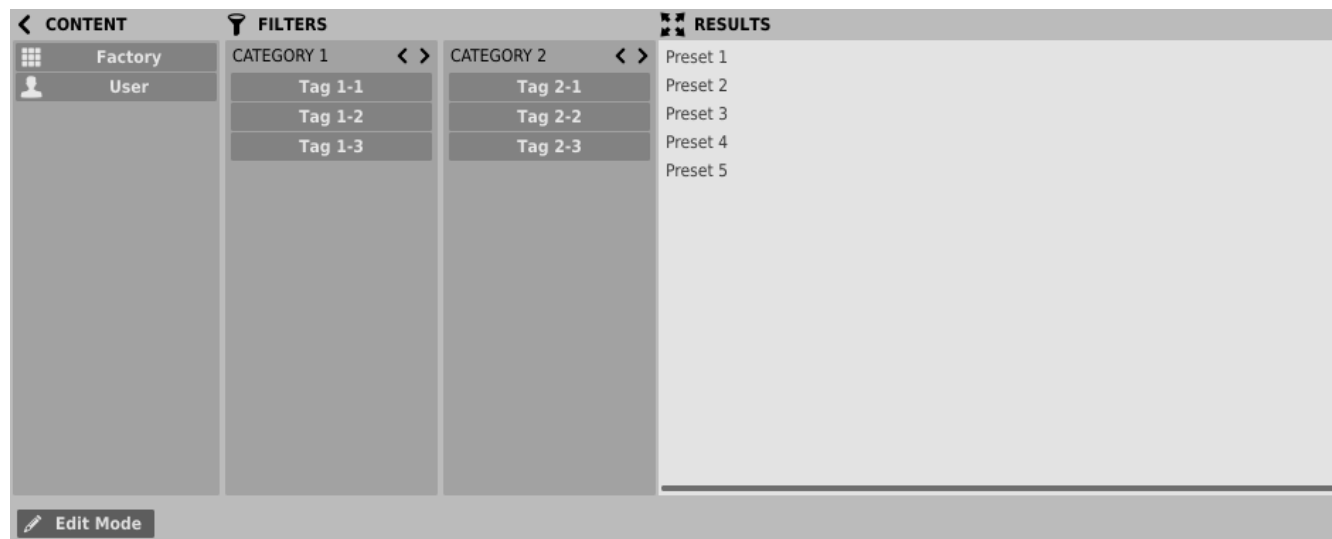
Presets Configuration and Management Section

- **PRESET** – Displays the name of the currently loaded preset. Clicking the display opens **Preset Browser** panel at the bottom of GUI section allowing to browse factory / user presets.
- **PREV / NEXT** – Buttons that allow for linear browsing of 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).

Mouse right-click over the **Preset** display opens context menu with two additional options:

- **Init** - Restores initial settings of plug-in parameters.
- **Reload** - Reloads a current preset.

The **Preset Browser** looks as follows:



Preset Browser

One can see three main sections:

- **Content** – Sources from which presets can be read.
- **Filters** – Configuration of presets **Filters** (non-active by default).
- **Results** – List of presets from resources that meet criteria set by **Filters**.

Resources

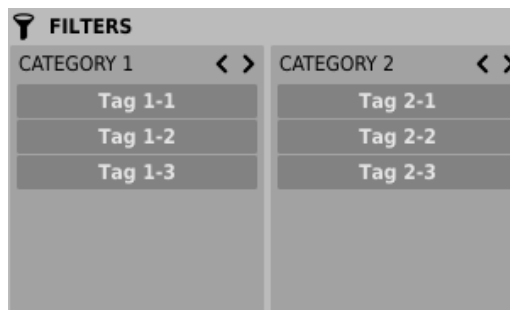
In this section you can choose a resource/resources in which you want to browse presets. There are two resources to choose from:

- **Factory** – Delivered together with the plug-in, cannot be modified (read-only).
- **User** – Created by the user during using the plug-in and can be freely modified, shared with other users etc.

Choosing any of them will cause narrowing the results to the presets from one resource.

Preset Filters

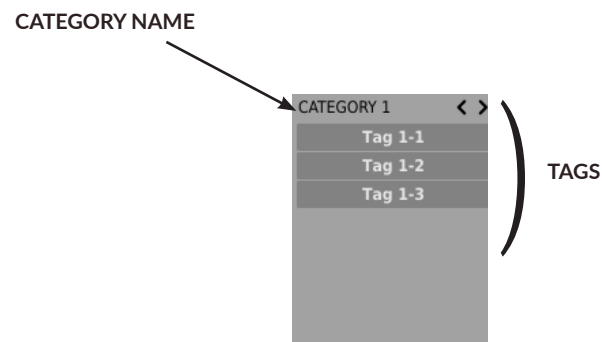
The plug-in enables classification of presets with the use of **Categories** and **Tags** system, whose aim is to facilitate the process of browsing the content by filtering.



Preset Browser Categories Filters

Categories and Tags

Each preset is described by a few common **Categories**. Within each of them there may be one or more **Tags** from a particular set.



A single category in a filter with a description of its elements

Presets from **Factory** resource were described by **Categories** and **Tags** during the stage of its creation. **Categories** and **Tags** are chosen in such a way so as to describe the content in the best possible way, taking into account the plug-in purpose.

Editing of **Categories** and **Tags** in case of **Factory** content is not possible – it is blocked. **User** presets may be described only with **Categories** and **Tags** from factory content or, alternatively, the users may define their additional **Tags** in order to describe their own presets.

Results

This is a list of presets from chosen resources that meet the filtering criteria. The basic function of this section is browsing and loading presets (in **Browsing Mode** – by default).



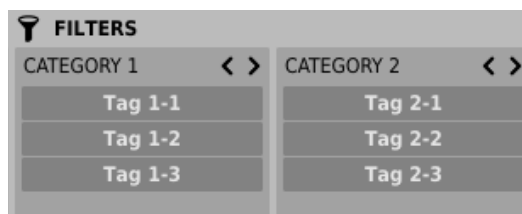
Results Section in Preset Browser

Click any name to choose and load the preset.

Double-click the name to enter preset name edit mode. ▶

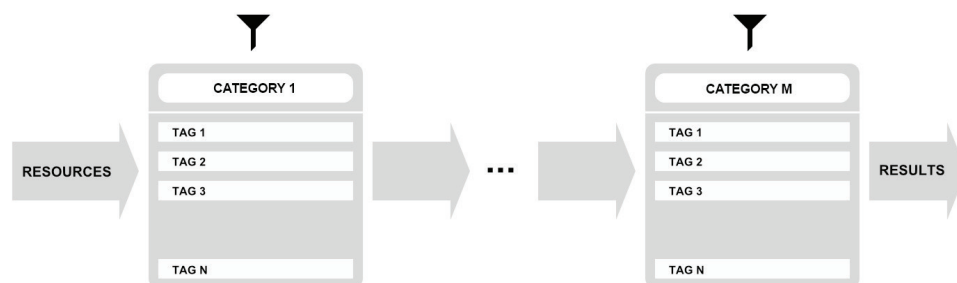
Presets Filtering

Filters section columns represent particular **Categories** – **Category filters**, while rows in each of these columns represent **Tags** available within each **Category**.



Preset Browser Categories Filters

Filtering results have a form of a cascade (columns), from left to right. This means that all presets available in the selected resources are filtered as to presence of **Tags** from the first **Category** (first column from the left), next a set of presets being a result of filtering by the first **Category** is filtered by the **Category** represented by the second column etc., until it is filtered with the last active **Category Filter**.



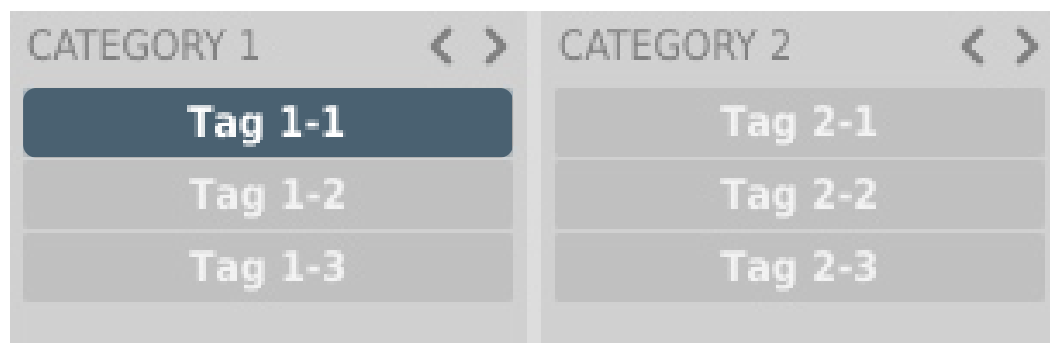
Presets Filtering with the use of Categories Tags

The result of a cascade filtering process (presets that meet the criteria of each filter) is listed below, in the **Results** section.

Basic Actions on Filters

Tag buttons in **Filters** work in toggle mode. Click to activate/deactivate **Tag** (Grey color means that the **Tag** is inactive, teal blue means that the **Tag** is active). If at least one **Tag** in a column (**Category**) is active, then the **Filter** also becomes active.

For example, if the first column represents **Category 1 Category** with a set of the following **Tags**: {*Tag 1-1, Tag 1-2, Tag 1-3*}, clicking the **Tag 1-1 Tag** will activate the **Category Filter Category 1** and narrow down a list of presets to the items in case of which the **Tag 1-1 Tag** appeared in the **Category 1 Category**.



Enabling Tag 1-1 tag in Category 1 Category

If you click the *Tag 1-1* item again, you will deactivate the **Filter**, so all presets from the content will be displayed again.

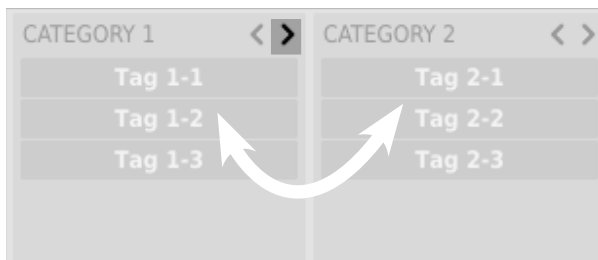
Reordering Categories

To the right of the **Category Filter** header there are buttons with arrow icons:



Filter reordering

They enable moving the **Category** to the left or right in a cascade. Clicking the right arrow replaces the current **Category** with the **Category** on the right. Clicking the left arrow replaces the current **Category** with the **Category** on the left.



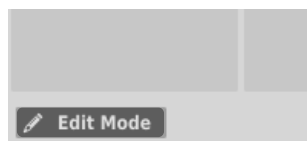
Presets Filtering with the Use of Categories Tags

Clicking the left arrow for the **Category** located on the far left does not change anything. The same is true for the **Category** located far to the right and right arrow (as the column has no predecessor/successor with which it could be replaced).

Presets Editing – Edit Mode

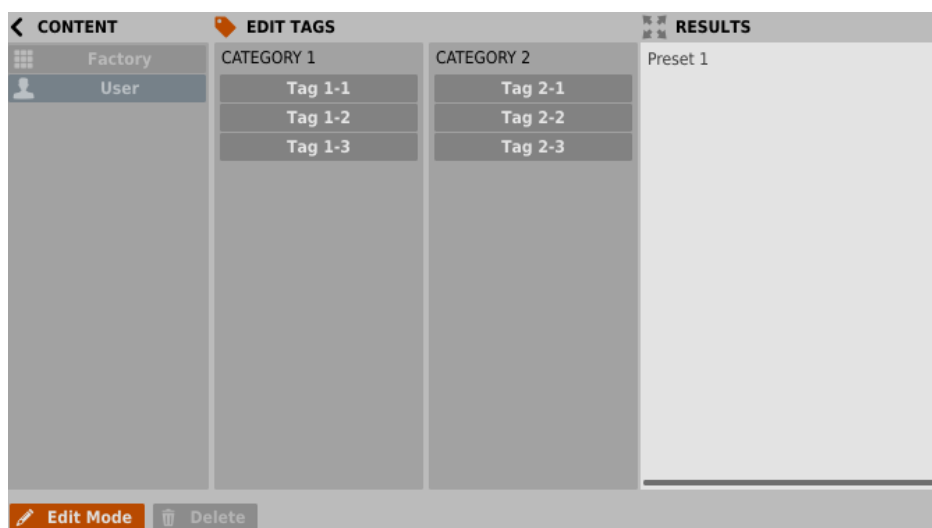
An active **Edit Mode** in **Preset Browser** changes its function (enables the change of presets names, edition of **Categories** or **Tags**, deletion of presets as well as their export or import. One should bear in mind, however, that these operations are not allowed in case of **Factory** presets, but only for the **User** presets.

Edit Mode can be activated with a button located in the bottom left-hand corner (click again to deactivate):



Edit mode button

In this mode **Preset Browser** slightly changes its appearance (not only function):



Preset Browser in Edit mode

1. The **Filters** section changes into the **Edit Tags** section, whose appearance is almost identical, but the function is different. The section is used not as a filter, but as an editor of **Categories** and **Tags** of chosen presets.
2. The role of the **Results** section is to choose presets for edition (edition is possible only for user presets).
3. At the bottom of the screen there is **Delete** button to delete selected **User** presets.
4. The choice of the resource in the **Content** section does not work, as edition is possible only for user presets.

Selection of Presets for Editing

You can edit both single preset and a set of presets. Using the functionality of the **Results** section, you can choose a preset or a set of presets in the following way:

- **Click the preset** – Choose the preset from the list,
- **Win** (**Ctrl**) + **Click the preset**), **Mac** (**Cmd**) + **Click the preset**) – Add another preset to an already chosen preset or a set of presets,
- **Shift** + **Click the preset** – Select a part of a list of presets from the last chosen preset to the item clicked together with **Shift** key.

Tags Edition

Change of Tags status in Presets

Tag buttons work in toggle mode, similarly as in case of filtering. Clicking them you can respectively set **Tag** or erase them from chosen presets.

User	Tag 1-1	Tag 2-1
	Tag 1-2	Tag 2-2
	Tag 1-3	Tag 2-3

Filters' tags

Choosing a greater number of presets, in which the tags were already defined, enables their re-edition. Consequently; in case when a specific **Tag** appeared in all selected presets, it will be marked with an intensive teal blue color.

When a specific **Tag** is set only in a part of chosen presets, then it is codified with a pale teal blue. The **Tag** that does not appear in any of the presets is marked with grey colour:



Notification about Tags Status in Chosen Presets

The change of the **Tag** status for one or more chosen presets sets or erases this **Tag** in all these presets. The status change is signaled with an **Asterisk** located to the left of the **Tag** buttons .



Notification about Changes in Tags Status in Chosen Presets

Elements/**Tag** buttons highlighted with pale teal blue colour (meaning different values of a particular **Tag** buttons for the highlighted presets) work in a three-state system; erasing the **Tag** (grey colour), setting of the **Tag** (intensive teal blue colour) or no changes (pale teal blue) for all selected items.

Changes introduced during edition do not have to be confirmed, they are signaled by asterisks located by **Tag** changed for particular presets

Presets Names Editing

Double-click the name of a preset to enter name editing mode.

Deleting Presets

Selection of one or more presets activates **Delete** button at the bottom left corner. It can be used to delete the selected presets.

Presets Export and Import

To export just drag'n'drop selected presets outside the plug-in to a desired location. To import presets just drag'n'drop preset files onto **Preset Browser** window.

Saving the current settings as Preset

To save plug-in parameters settings as a user preset use the **Save** button in **Configuration** and **Presets Browsing** section. This action automatically opens the **Preset Browser** in Save Mode.



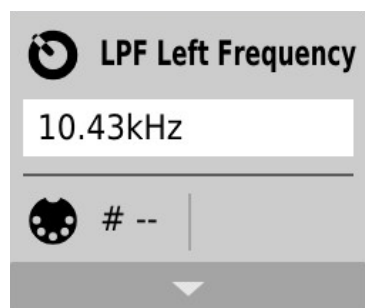
Saving the Settings as Preset

Additionally, at the bottom there will be a textbox into which you should enter a name of a newly created preset, and then confirm it by clicking **Save** or cancel by clicking **Cancel**.

Configuration

Parameter settings

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



Closed Context Menu

It allows for:

- Checking the name and current value of a parameter,
- Checking if the parameter is attributed to MIDI CC controller, and if it is – to which number,
- Linking the parameter to MIDI CC controller.

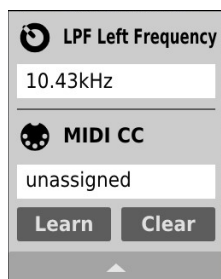
Clicking the arrow in any area of the menu expands it and displays all available options.

Next right-click on the parameter or left-click outside the menu area closes it automatically.

MIDI Learn

MIDI Learn function enables a quick assignment of physical controllers (from MIDI controller) to plug-in parameters. The assignment can be divided into a few steps:

1. Right-click the parameter which you want to attribute to physical MIDI controller in order to expand the context menu.
2. Click arrow at the bottom in order to expand the context menu.



Expanded Context Menu

3. Click the **Learn** button to put the plug-in into a pending state until you move any MIDI CC controller.
4. Click **OK** to save the change or click the **Cancel** button to restore the previous setting.

MIDI Unlink

You can also delete MIDI CC code attributed to plug-in parameter from the context menu:

5. Open the context menu, right-clicking the parameter attributed to a particular MIDI CC
6. Expand the menu, using the arrow at the bottom
7. Click the **Clear** button
8. Confirm with **OK** button

Plug-in's current settings

Current settings are relevant to a specific instance of a plug. They are initialized with the **Default settings**, when the plug-in is loaded (see the next chapter):

At the bottom of UI there is a status bar that enables the change of **Current settings**.



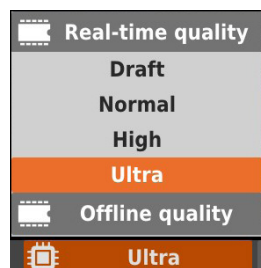
Current Settings in a Status Bar

From left to right there are:

- The setting of **Current processing path quality** for the **Offline** mode and the **Real-time** mode
- **MIDI** Saving/Loading the **MIDI CC Map**
- **GUI** - Selecting UI size
- **Options** - Opening **Settings** panel or **About** box

Processing Path Quality

Clicking the item expands the menu that allows to select the **Current quality** of generated sound for **Real-time** or **Offline** modes. In a case of Repeater the quality setting doesn't affect the delay loop, but audio clipper only.

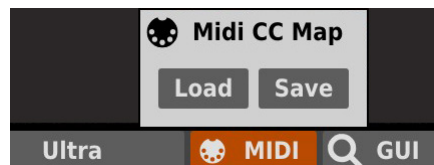


Processing Path Quality Settings

We can choose from four available grades for each mode.

Saving/Loading the MIDI CC Map

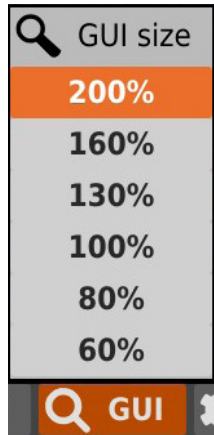
This item enables to save current parameters of MIDI CC codes as MIDI Map in a file or to load them.



Saving/Loading the MIDI CC Map

GUI size

Switch the graphical user interface between few different sizes.



Choosing the plug-in interface size

Options

Options pulls up menu with following items to select from:

- **Settings** - Opens panel with **Default Settings** of the plug-in
- **About** - Opens splash box with information about the version of the plug-in and license

Plug-in's default settings

The **Settings** panel allows us to change the **Default settings** of the plug-in. Every time the plug-in is loaded in the host application (new instance is created) a **Default settings** are used for initialization of the **Current settings**.

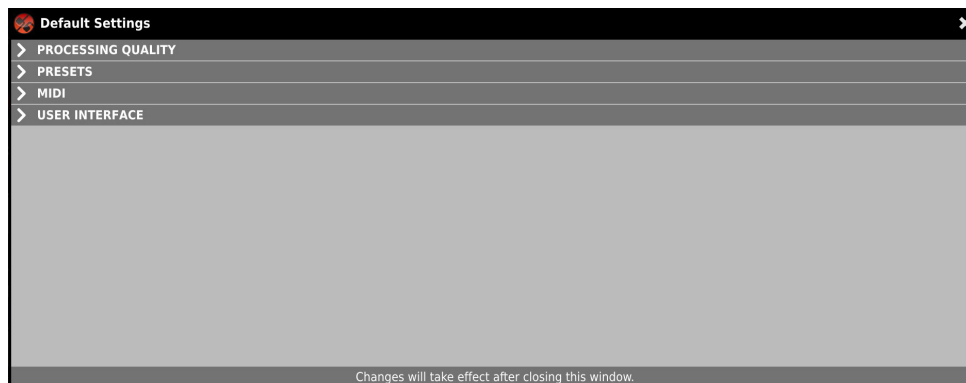
Default settings are stored within a configuration file of the plug-in. This file is updates at the moment of closing **Options** panel.

Use **Options** -> **Settings** item to open **Settings** panel



Options button

The **Settings** panel operates as an accordion where you can click a specific section to expand it:

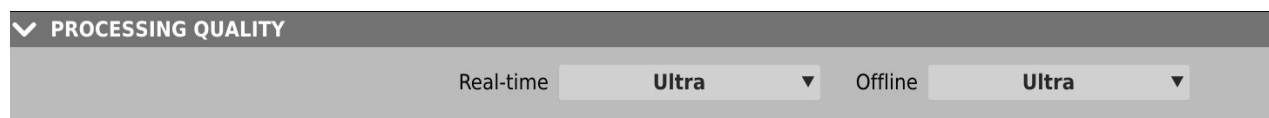


Settings Panel

There are three sections:

- **Processing Quality** - Default Processing Path Quality
- **Presets** - Presets loading settings
- **MIDI** - Default MIDI CC Map
- **User Interface** - Changing default UI size and system scale

Default Processing Path Quality



Processing Quality Choice Section

In this section you can configure a default quality of the processing path for the **Real-time** mode and the **Offline** mode.

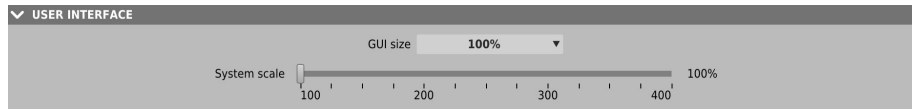
Default MIDI CC Map



Default MIDI Map Choice Section

This section allows for setting of a path to a file with a default **MIDI Map** that was prepared before. Clicking **MIDI CC Map** check box activates load of **MIDI Map** and the possibility of pointing it (**Browse** button).

User Interface



Default size of User Interface

GUI size combo choose one of several default skin sizes to best match the plugin to the resolution of your computer monitor.

System scale slider controls the factor which whole plug-in window is rescaled to - it's recommended to set it to the exact value from your system settings (screen properties) for the best visual results.

Presets

☐ **If parameters were changed show warning before loading Prev/Next preset**

Displaying confirmation dialog option

With the box checked, clicking the **Prev** or **Next** preset button after the parameters of the current preset (or previously initialized state) have been changed pops up a confirmation dialog to prevent accidental loss of those changes.

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