

# FRQ·Shift

## Owners Manual

by

TONSTURM

**g**GS DSP

**FRQ Shift** v.1.0.2 owners manual

Document Version v.3

### **Minimum System Requirements:**

- Mac OS X 10.13 (64-bit), 4 GB Ram, Intel® Core™ i5 and Silicon Macs
- Windows 7 and above (64-bit), 4 GB Ram, Intel® Core™ i5
- Free iLok account

### **Credits:**

**Idea Concept:** Tilman Hahn & Gustav Scholda

**DSP Programming:** Gustav Scholda

**Mod System & UI Programming:** Ryan Mc Gee

**Graphic Design & Concept:** Ingo Hermes

**Thank you:** Dustin Kopischke

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# 1. INSTALLATION

After downloading simply unpack the ZIP archive, then launch the installer. It will guide you through the process. Files will be copied into the common VST2.4, AU or Pro Tools plug-in folders on your computer. Your host should recognize the plug-in automatically with the next restart and you will be asked to register FRQ Shift with your iLok account.

## 1.1. MAC OS X

On Mac OS X you will find the standard plug-in folders in the system library folders. The paths are as follows:

**Audio Units (AU):** /Library/Audio/Plug-Ins/Components

**VST:** /Library/Audio/Plug-Ins/VST and /Library/Audio/Plug-Ins/VST3

**AAX:** /Library/Application Support/Avid/Audio/Plug-Ins

## 1.2. WINDOWS

On Windows you will find the standard plug-in folders in the system library folders. The paths are as follows:

**VST:** C:\Program Files\VSTPlugins

**AAX:** C:\Program Files\Common Files\Avid\Audio\Plug-Ins

If your host does not recognize the plug-in, you might need to manually copy it to the host specific plug-in path.



### **1.3. iLOK Registration**

Authorization Wizard: The authorization wizard will open if the plugin is not yet authorized when you insert the plugin, or when it is scanned by your host application. You need to have an iLok account in order to use FRQ Shift. Setting up an iLok account is free and easy. You will find all information on [www.ilok.com](http://www.ilok.com). Choose whether to activate to your Computer or to an iLok 2 or later. Please note that first generation iLoks are not supported.

Please download the iLok Manager at [www.ilok.com](http://www.ilok.com). After your purchase from TONSTURM, you receive an email from us containing the download link for the installer plus an iLok activation code: (i.e XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XX)

Choose ACTIVATE. You will then be presented with the activation window, where you may enter your code. You should then copy paste the entire code into the entry form. Select your activation location: your computer or your iLok.



## 2. What is FRQ Shift

FRQ Shift is an ultra clean sounding, artifact free, dual frequency shifter engine. It offers precise control over both shifter engines that can be linked and crossfaded into each other. Further we included effects that can be introduced into the feedback path of the shifter engines. On top of the pristine sounding DSP we added the intuitive to use and powerful TONSTURM modulation system that allows you to create tense and alive sounding patches to transform and mangle your incoming audio.

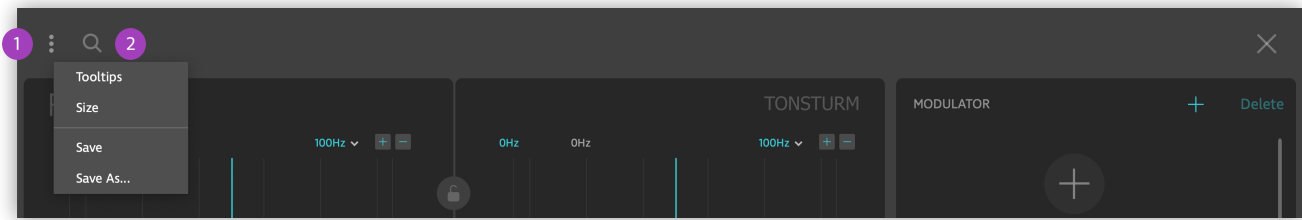
### Frequency Shifting explained:

Frequency Shifting is the process of shifting all component frequencies of a sound by an equal amount. If your input is harmonic, it will destroy the harmonic relationship resulting in a more unnatural sound. Non-harmonic (especially percussive) sounds are less sensible to extreme settings. In any case, your input is at the same time going to be changed in pitch (but unlike a Pitch Shifter the whole process can be done with zero latency and no smearing of transients).

Additionally, if you apply frequency shifting in a feedback loop using a shift amount below  $\pm 20$  Hz, you can get very interesting phasing/flanging effects.

## 3. EXPLAINING THE UI ELEMENTS

### 3.1.The Top Header



#### 1.) Settings Menu:

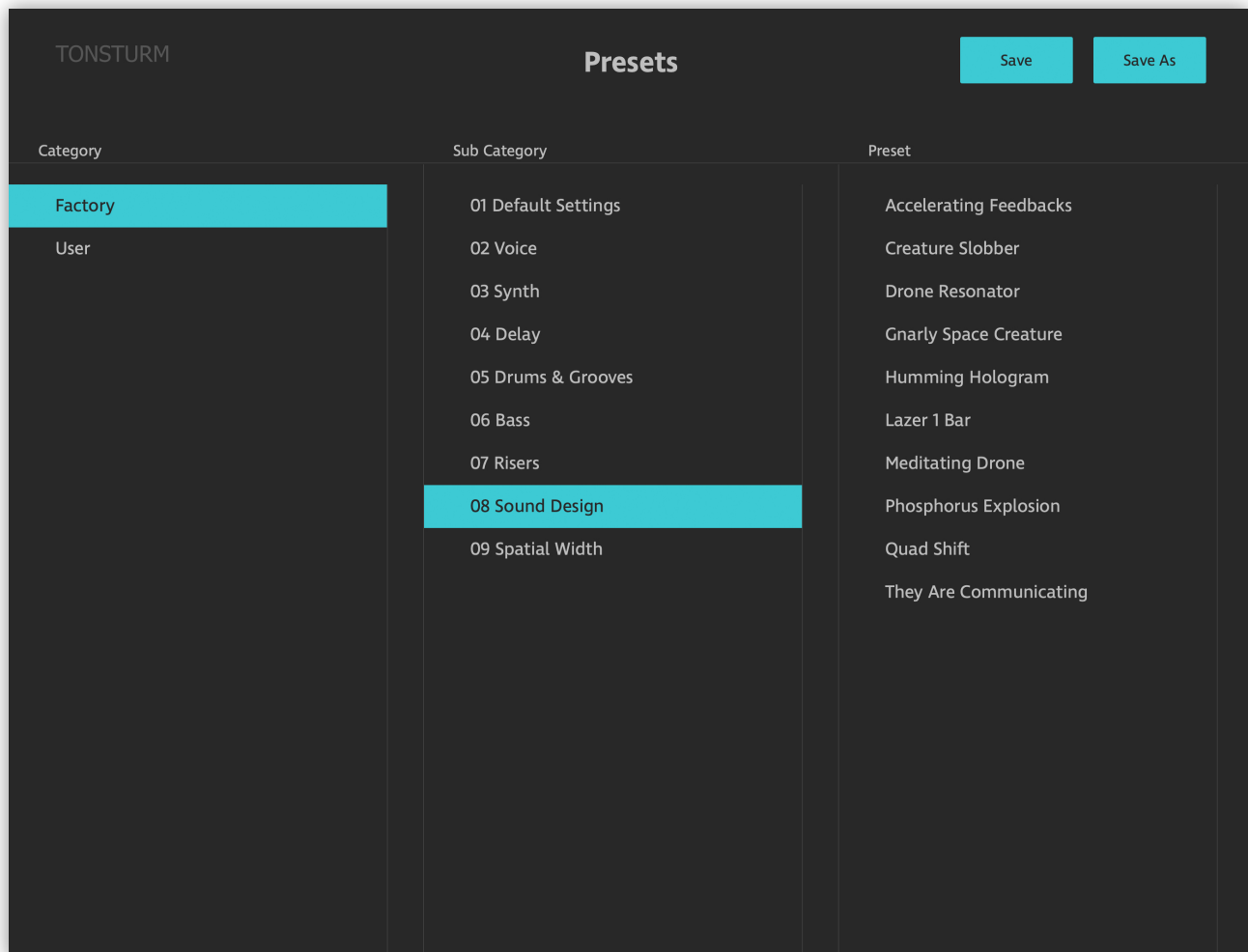
- Tooltips: If active, resting your cursor on a parameter will show you a description (if there is one)
- Size: Increases or decreases the size of the plugin window from 75% up to 200%. Depending on your screen resolution.
- Save: Saves the current patch at the designated folder and overwrites the currently selected patch.
- Save As: Saves the patch at the designated folder and does NOT overwrite the initial Patch

#### 2.) Open Preset Window

## 3.2. The Preset Window

In the Preset Window you are able to browse Factory and User presets by clicking on the tabs in the Category bar. The presets are divided into Sub Categories for your convenience. The right column displays the actual Presets of the selected folder or sub folder.

The Save and Save As Buttons on the top right corner allow you to save the existing patch to your preferred location.



### 3.3 Frequency Shifter Section

This section gives you access to the powerful dual frequency Shifter Engine. It consists of two identical Shifter Engines with the addition that Shift 2 can be linked to Shift 1. Further both Shifter engines can be crossfaded into each other. We are going to explain all the features in detail:



1.) Shift 1 & 2: Here you can change the amount of Shift in Hz or BPM. The BPM mode makes sure you stay in sync with your host, and includes regular, triplet and dotted notes.

2.) Frequency Spread / Phase Spread:

2 a.) Frequency Spread Mode: This control determines the frequency of the right channel as a multiple of the Left Shifter's frequency or vice versa. At small spread amounts, this will create a super-wide stereo phasing effect.

2 b.) Phase Spread Mode: If you want to keep the frequency of both channels the same, but still want to spread the stereo image by changing the phase correlation of the frequency shifters left to the right channel, you should use this.

3.) The first line shows you the current shift frequency and the following ascending lines the resulting frequencies due to feedback. Blue (left channel) and white (right channel).

4.) Hz / BPM Mode: The Hz Mode allows you to shift the Input Signal in Hz. To sync the timing of the phasing to the host use the BPM mode.

5.) X-Fade: Let's you cross fade between the two frequency shifter engines. In-between settings or modulation of that parameter can create very complex modulations of your input.

6.) Reset: Resets the phase of both engines. This is only active when at least one of the Frequency Shifters is in Hz mode. In BPM mode it has no effect.

7.) Link: To link Shifter Engine 2 to Shifter Engine 1 click the lock symbol. In link mode Shift 2 follows Shift 1 with an adjustable offset. In Link mode you keep the relationship between the Frequency Shifters the same when changing Shift 1.

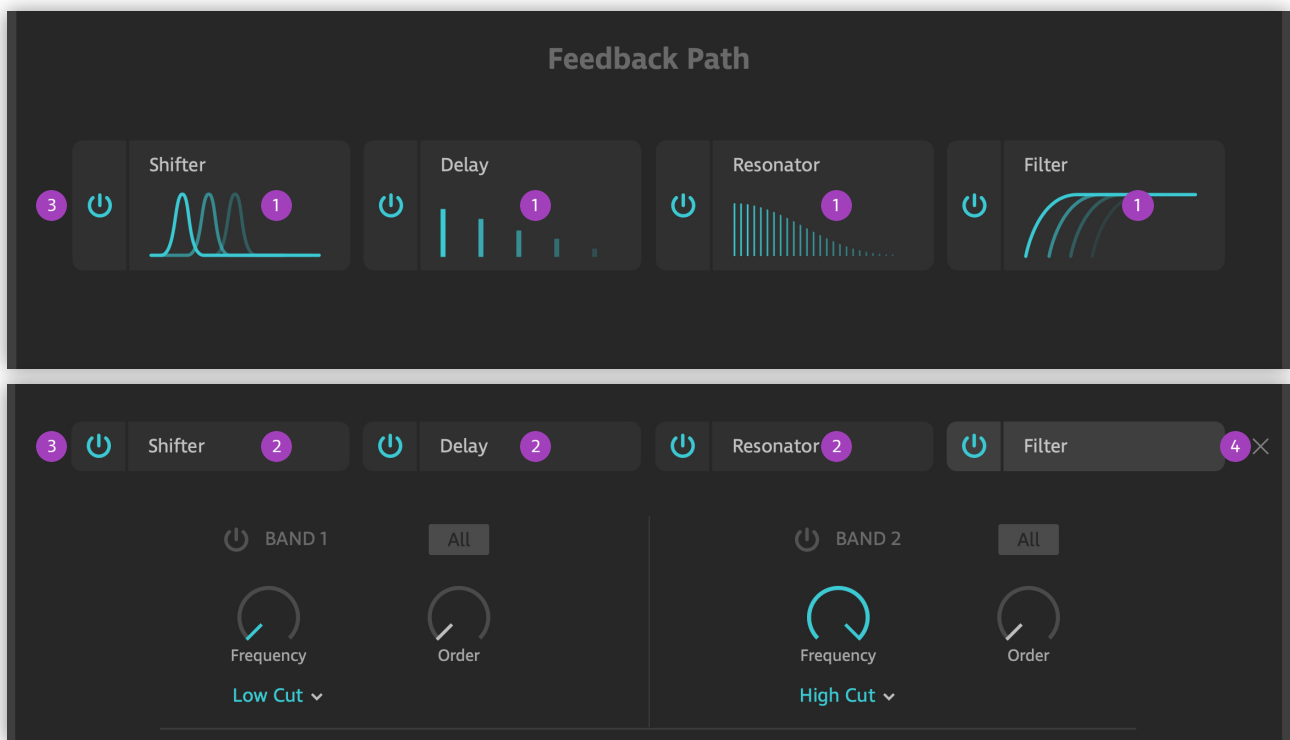
8.) Zoom: Zoom in and out of the visual representation of the frequency shifter scope (doesn't affect the sound).

9.) Shift Range: This determines the possible ranges of the frequency shifter. (Range: 1Hz-5000Hz). Click on the arrow and select the range you would like to use. Use lower frequency ranges and feedback for pleasant phasing effects. This menu is not accessible when the shifter is set to BPM mode.

From 1Hz-500Hz is a more subtle shift, while the range from 500Hz-5000Hz is suited for extrem shifting effects.

### 3.4) Feedback Path Front Panel:

This is an overview of all Feedback Path Effects including The Shifter itself, Delay, Resonator and Filter. Clicking on an effect tile brings up the settings window for the individual effect.



1.) Clicking on a feedback effect tile opens the effect section

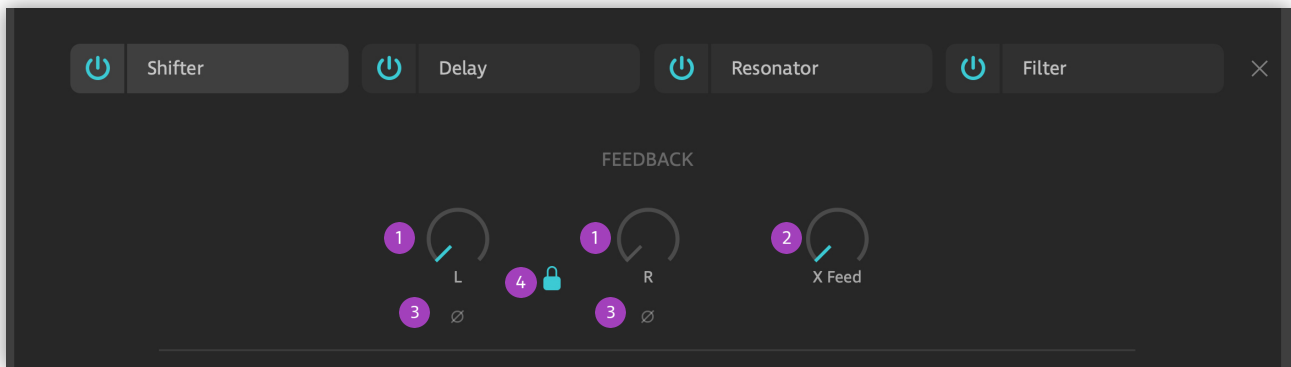
2.) Navigate through the effects by clicking on their tiles

3.) Enable/Disable the effect

4.) X: Close the effect section

### 3.4.1.) Feedback Shifter:

The Feedback Shifter section allows you to feed the output signal of the Frequency Shifters back into its input. Low frequencies (below 20 Hz) will result in phasing effects. To sync the phasing to the host use the BPM mode on the Shifters.



1.) Feedback: Controls the amount of feedback. If linked, the left channel feedback controls the feedback amount for both channels. *Careful, high feedback causes an increment in volume or might lead to nasty sounding distortion effects!*

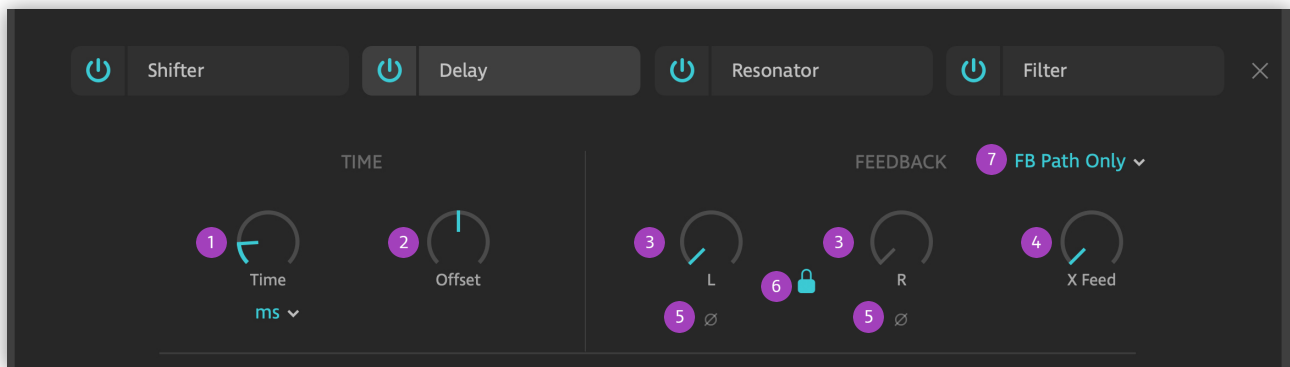
2.) X Feed: Cross feeds the left channel into the right channel and vice versa.

3.) Phase Invert: Lets you inverse the phase of each channel.

4.) Link/Unlink: In unlinked mode the left and right channel can be controlled and modulated separately.

### 3.4.2.) Feedback Delay

The Feedback Delay section allows you to feed the signal of the Frequency Shifters into a Delay effect and back into its input again.



1.) Time: Controls the delay time. In ms mode the range is 0-4000 ms, in BPM mode you can sync the delay time to the host's BPM.

2.) Offset: Dial in some frequency or BPM offset for the right channel delay to create spatial effects.

3.) Feedback: Controls the amount of delay to be fed into the frequency shifters feedback path. The signal is shifted every time it is fed back which results in sequences with a constantly changing spectrum. *Careful, high feedback causes an increment in volume or might lead to nasty sounding distortion effects!*

4.) X Feed: Cross feeds the left channel delay into the right channel and vice versa.

5.) Phase Invert: Lets you inverse the phase of each channel.

6.) Link/Unlink: In unlinked mode the left and right channel can be controlled and modulated separately.

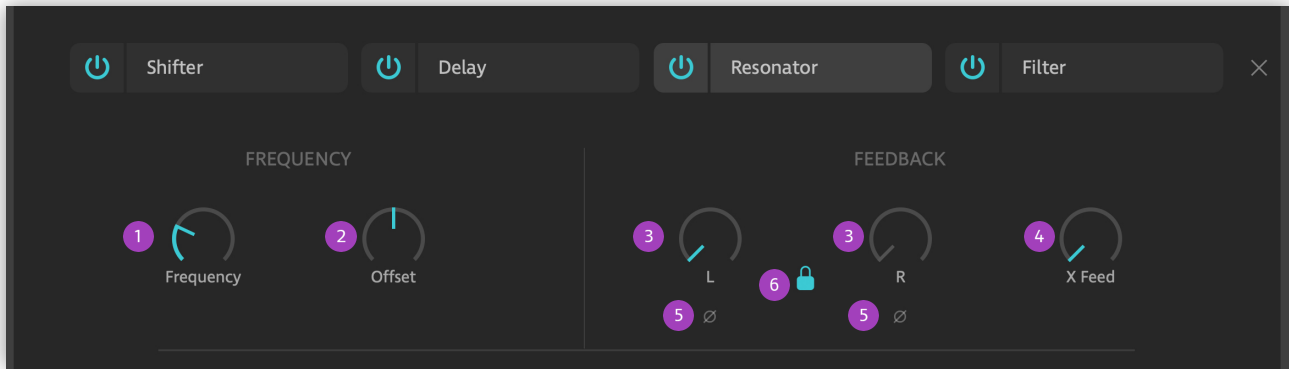
7.) Delay Mode: Changes the routing of the Delay Effect.

**FB Path Only:** Is adding the Delay Effect to the Feedback Path similar to an Insert Effect.

**Input + FB Patch:** Is adding the Delay Effect to the Feedback Path and the Input Signal and has more of a Send Effect character. This mode is also suited well if you want to use FRQ Shift as a frequency shifting delay and want to insert it @100% Wet on your DAWs Send Bus.



### 3.4.3.) Feedback Resonator



1.) Frequency: Sets the base frequency for the resonator in the range of 10 Hz up to 20 kHz.

2.) Offset: Dial in some frequency offset for the right channel delay to create spatial effects.

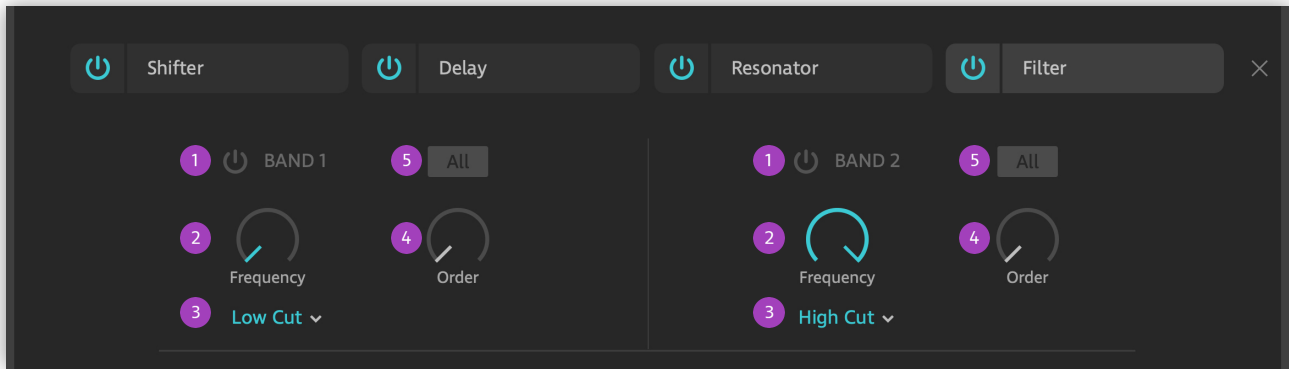
3.) Feedback: Controls the amount of resonator effect to be fed into the frequency shifters feedback path. The signal is shifted every time it is fed back which results in organically groaning and screaming added textures. Careful, high feedback causes an increment in volume or might lead to nasty sounding distortion effects!

4.) X Feed: Cross feeds the left channel delay into the right channel and vice versa.

5.) Phase Invert: Lets you inverse the phase of each channel.

6.) Link/Unlink: In unlinked mode the left and right channel can be controlled and modulated separately.

### 3.4.4.) Feedback Filter



1.) On/Off Switch: Turns the filter on or off.

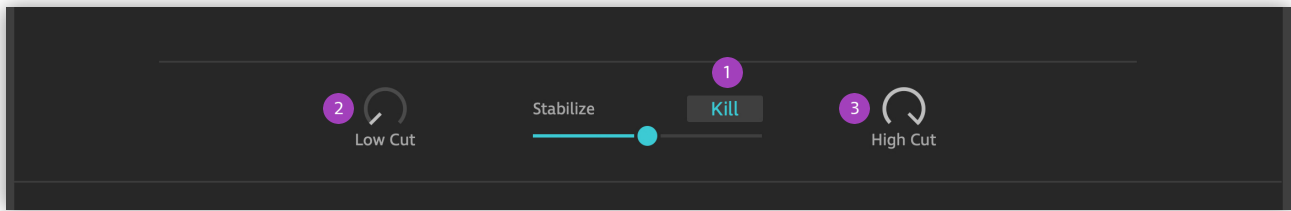
2.) Frequency: Controls the frequency of the chosen filter.

3.) Type: Choose between LowCut, HighCut, Bandpass, Notch and All pass.

4.) Order/Q: Sets the quality of the chosen filter (Order: 6dB/Oct – 24dB/Oct, Q 0-1).

5.) Post Switch: If active the filter is processing not only the feedback path, but also the output of the Frequency Shifter.

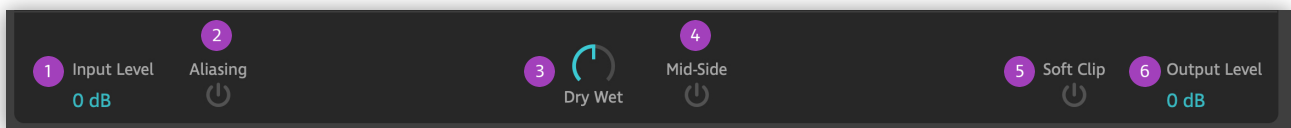
### 3.5.) Stabilize and Feedback Path Filter



**Stabilize:** Feedback loops can get unstable easily, but the Stabilize control is the main tool to tame this. In the middle position your feedback path stays on the edge of blowing up. Move it to the left for less to 0% stabilization, move it to the right for more to 100% stabilization.

- 1.) Kill: Clears the feedback loop.
- 2.) LowCut: Applies a low cut filter on the feedback loop.
- 3.) HighCut: Applies a high cut filter on the feedback loop.

### 3.6) Lower Bar



- 1.) Input: Controls the input gain of the plugin (only affects the wet signal)
- 2.) Aliasing: Higher amounts of frequency shifting can easily produce aliasing artifacts - especially when shifting down. This can be a desired effect but if not simply turn off Aliasing to get rid of them.
- 3.) Dry/Wet: Mixes between dry (input) and wet (output) signal. A lot of patches are balanced somewhere at around 50/50 - Dry/Wet as FRQ Shift produces interesting sounding phase cancelation effects at these settings.
- 4.) Mid Side: Activates MS decoding, which sometimes sounds more spatially stable at higher frequency spread settings. *Be careful! If no frequency spread is introduced the wet signal will only come from the left speaker.*
- 5.) Soft Clip: Activates soft clipping on the whole plugin to prevent digital clipping.
- 6.) Output: Controls the output gain of the plugin (only affects the wet signal)

## 4.) Modulation Section

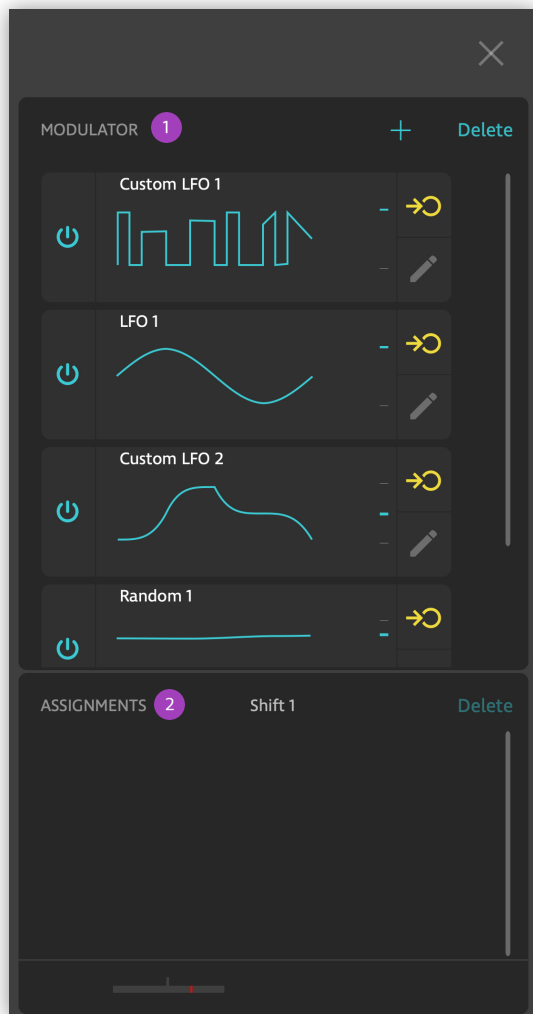


In this Section we want to introduce our flagship TONSTURM modulation system which serves you precise and powerful modulation control over all Plug-In parameters.

Choose from various modulators like LFO, Custom LFO, Random LFO and Envelope Follower to create unique Effects. We know how important a quick and easy workflow is to keep the creativity alive and that's why we designed the Assignment Panel. This Panel gives you quick access to all key features of the modulator and its destinations.

Let's dive in deeper!

## 4.1) The Modulation Section



### 1.) The Modulator Overview List:

The right section of FRQ Shift displays the modulation section, which currently provides 4 different types of modulation sources: LFO, Custom LFO, Random, Envelope Follower. Added modulators can be conveniently browsed and selected from here.

### 2.) Assignment Panel:

The Assignment Panel has 2 different main modes and always

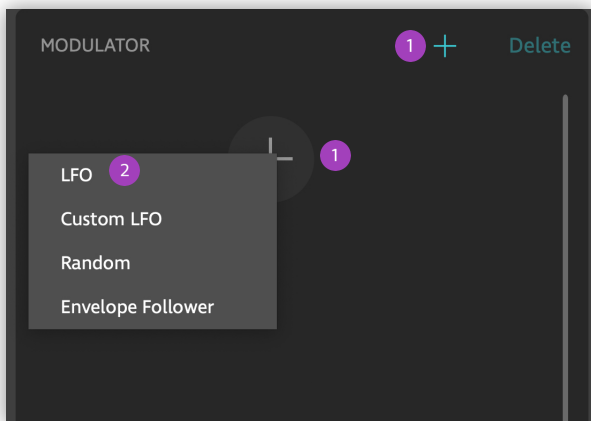
### Modulator view:

By selecting any Modulator an overview of all parameter destinations for this specific Modulator will be displayed and you can make final adjustments from here or the destination parameter of course. This mode comes in handy if you want to change the modulation rate of the feedback Delay without searching for the knob again or simply get an overview of the list of parameters this modulator is assigned to.

### Parameter view:

By selecting a parameter you see a list of all modulators that are assigned to the selected parameter. If you have multiple modulators on the Shift 1 and you want to change the Modulation of the Random modulator from unipolar to bipolar you are able to do this from the Assignment Panel or from the parameter it self of course.

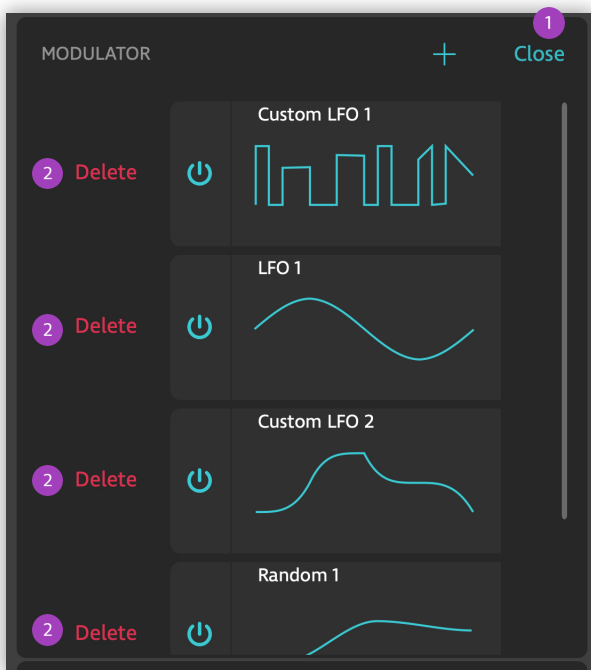
## 4.2) Loading a Modulator



1.) Load: Opens the modulator selection list.

2.) Select a modulator of your choice and it will be loaded into the modulator overview browser ready to be assigned to any parameter.

## 4.3) Deleting a Modulator



1.) Delete/Close: Opens or closes the delete bar.

2.) Red Delete: Finally deletes the Modulator next to the Delete Button

#### 4.4) The Modulator tiles



1: Mutes / Unmutes the Modulator

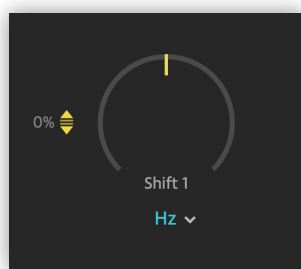
2: Overview of the current modulation amount at the modulators output

3: Enables / Disables the Assignment Mode.

4: Opens the edit window of the modulator

## 5. Assign Mode

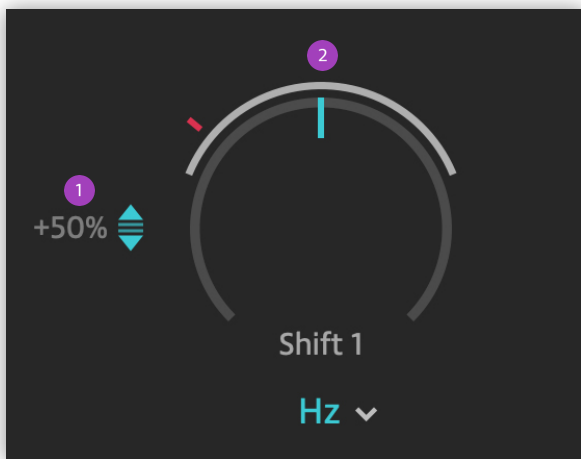
Now that the Assign Mode is enabled you can choose any Parameter that has turned yellow as a destination for your modulator. This also includes parameters of the modulator itself and other modulation modules. For example you can modulate the frequency of your LFO with the signal of a random modulator. If you want to get into more extrem and out of your mind sounds, thats the route to go!



1.) The arrows beside the Parameter can be dialed up and down to increase the the range in which the Parameter is being modulated.



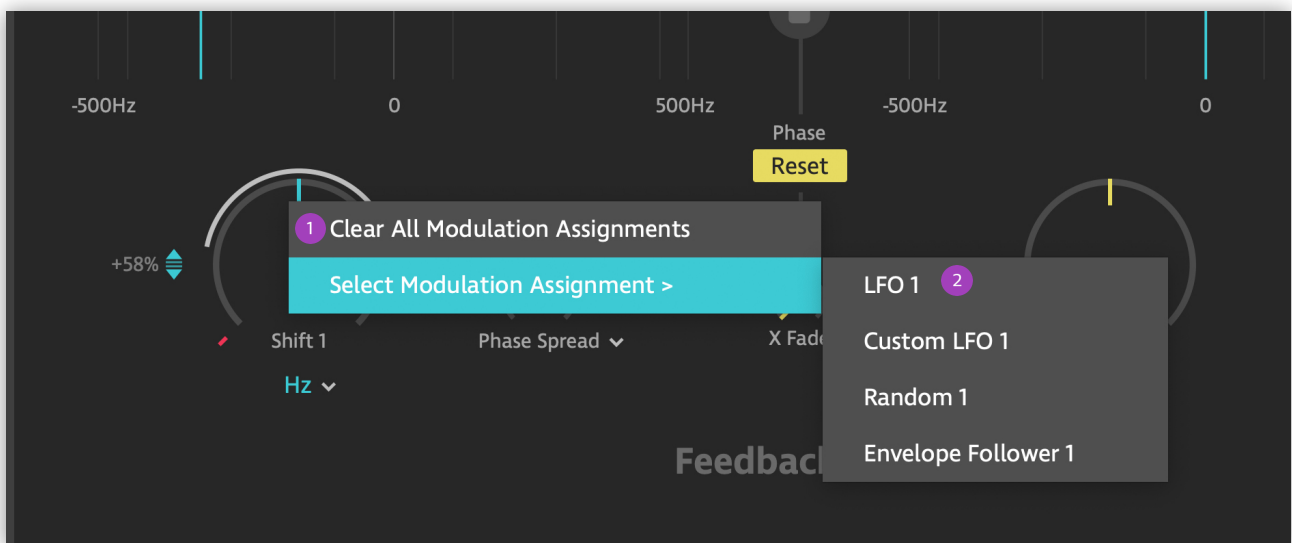
### 5.1) Knob after being assigned to a modulator:



1.) Blue Arrows: The percentage value displays how much modulation is applied.

2.) Modulation Range: Gives a more visual feedback of the exact modulation range.

### 5.3) Right Click Menu



1.) Clears all modulation assignments with one click.

2.) Select any of the assigned modulation sources to be displayed on the current parameter control.

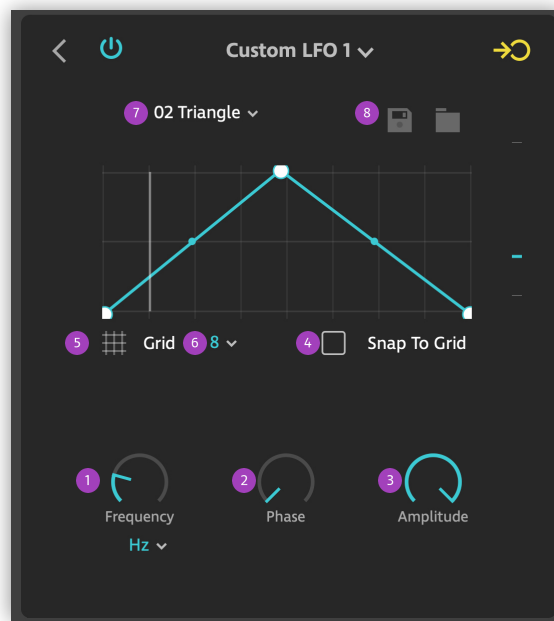
## 6 Modulator Modules

### 6.1 LFO



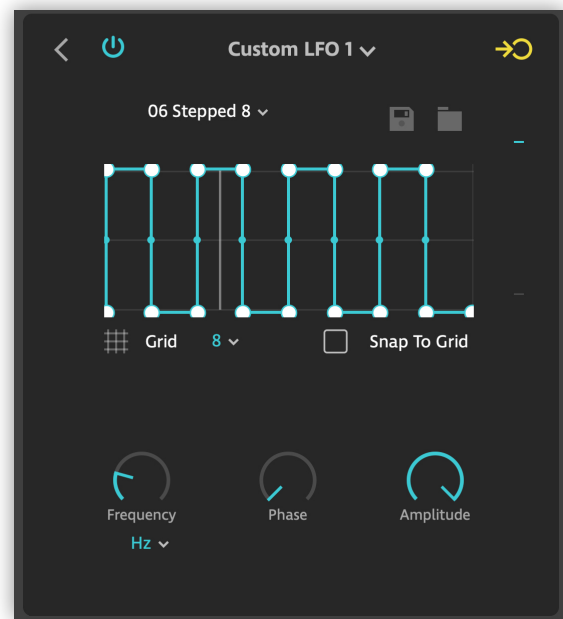
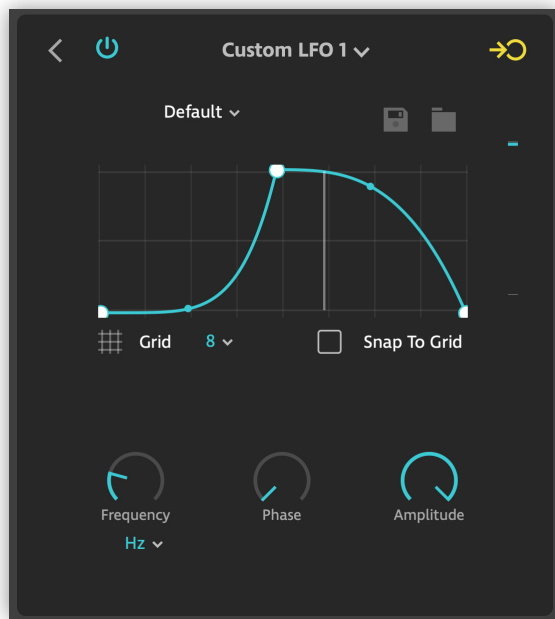
- 1.) Frequency: Controls how fast the output of the LFO varies over time. Can be set to Hz and BPM Mode.
- 2.) Phase: Offsets the starting point of the modulation.
- 3.) Amplitude: Controls the overall modulation amount of the LFO for all destinations.
- 4.) The shape of the LFO output is controlled with the Faders. The Y/Left slider adjusts the basic shape of the signal, morphing it smoothly through four standard shapes: a sine wave, a triangle wave, and a square wave.
- 5.) The X/Right Slider adjusts the horizontal symmetry of the wave, and has a different effect depending on the wave's initial shape. For example, if the X/Left Fader is set to produce a triangle wave, the Y/Right Fader varies the wave from a downward-sloping ramp to a rising ramp. If the X/Left Fader is set to a square wave, the Y/Right Fader varies the duty cycle of the wave.

## 6.2 Custom LFO



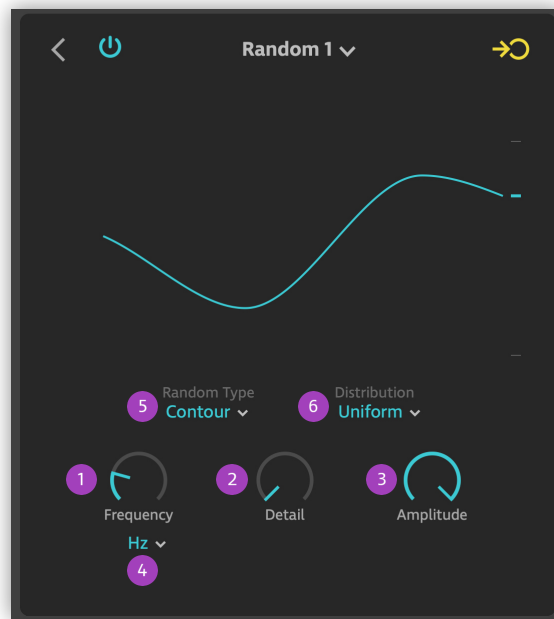
- 1.) Frequency: Controls how fast the output of the LFO varies over time. Can be set to Hz and BPM Mode
- 2.) Phase: Offsets the starting point of the modulation.
- 3.) Amplitude: Controls the overall modulation amount of the LFO for all destinations.
- 4.) Snap To Grid: Enables the Grid mode and lets the path points snap to the grid.
- 5.) Grid: Enables the visualization of the Grid.
- 6.) Grid Size: Sets the grid size of the LFO graph. You will see the visual grid background of the LFO graph change while adjusting this number.
- 7.) Drop Down Menu: This pop-up menu gives you quick access to a few factory presets for custom LFO shapes as starting point. You also get quick access to your own preset shapes from your user folder.
- 8.) Disk Symbol. Click here to save your custom LFO shapes.

## 6.2.1 How to create your own Custom LFO Shapes



- To add more modulation points simply double click in the grid. By clicking and dragging you can move the points to your preferred location.
- To delete modulation points, right click on the point you want to delete
- If you want to smooth out your created LFO shape you can click the small dot between the Modulation points and bend the line between the modulation dots.

## 6.3) Random



1.) Random:Frequency: Controls the update rate of the random generator. The easiest way to examine this is setting Detail to 0 and watch the resulting curve

2.) Detail: Defines the amount of detail in the generated random function. Low detail settings result in a smooth curve, increasing detail adds more and more tiny fluctuations.

3.) Amplitude: Controls the overall modulation amount of the Random modulator for all Destinations.

4.) BPM Switch: Enabling this will make the time value snap to tempo-based units (divisions 1/4 note, 1/8th note, etc).

5.) Random Type: Changes the Modulation Mode from Contour to Sample & Hold.

6.)RandomDistribution: Changes the distribution of the random generator. (Uniform/Normal)

## 6.4 Envelope Follower



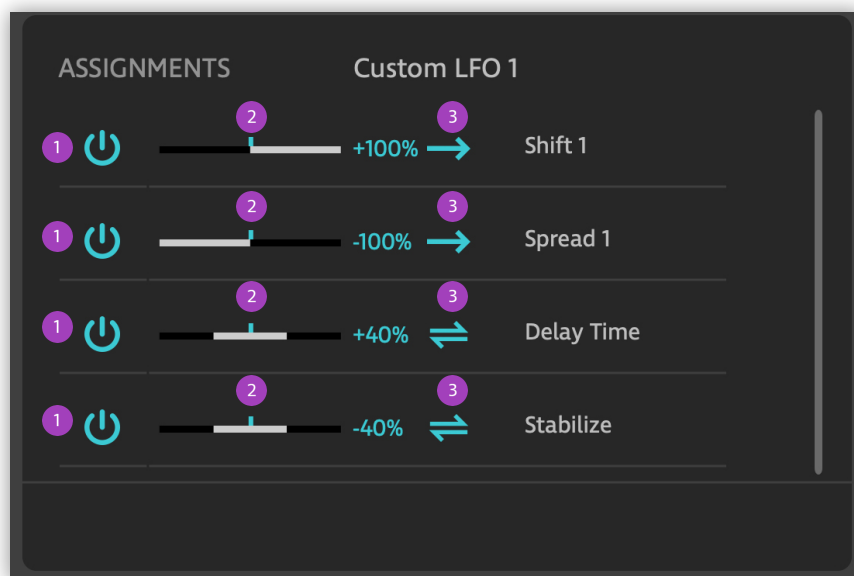
- 1.) Attack: Adjusts the attack time of the envelope in milliseconds.
- 2.) Release: Adjusts the release time of the envelope in milliseconds.
- 3.) Amplitude: Controls the overall modulation amount of the envelope follower for all destinations.
- 4.) Low Cut: Applies a low cut filter on the input signal.
- 5.) High Cut: Applies a high cut filter on the input signal.
- 6.) Range Handles: Fine tune the range of the envelope output.
- 7.) Dynamic range: Adjust the maximum dynamic range that will be used.

## 7.)Assigne Panel

### 7.1) Modulator View

The Modulator View is active when selecting any modulator. This gives you an overview for all parameter destinations of a selected modulator and instant access to all key modulation settings from one place.

Please Note: When you are in Assign Mode of a Modulator the Modulator View is locked to the Modulator View for that specific modulator as long Assign mode is activated.



1.) Mute / Unmute: Enables or disables the modulation for the specific parameter destination.

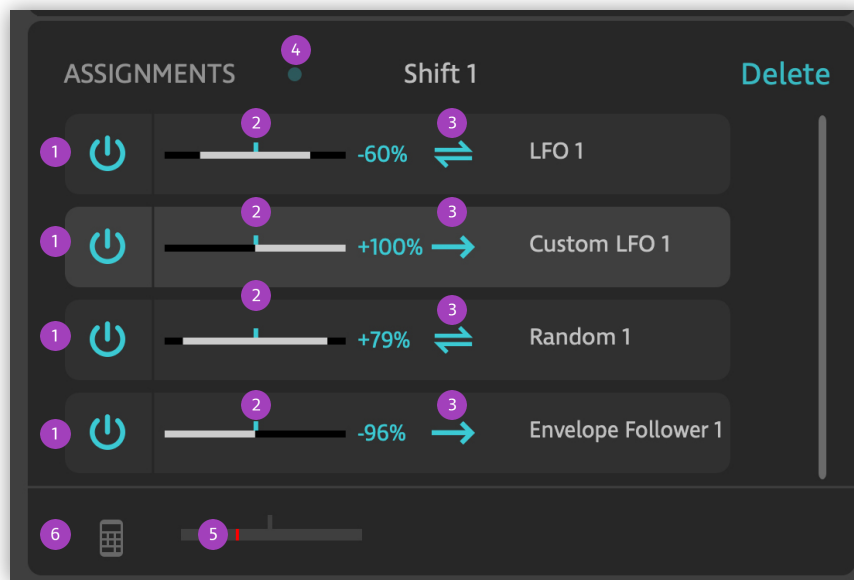
2.) Modulation Range: Increase or decrease the amount of the modulation

3.) Bipolar / Unipolar: Changes the modulation from positive - negative to only positive or negative

## 7.2) Parameter View

To open the Parameter View click a parameter that ideally has one or more modulators assigned to it. The Parameter Assignment view gives you an overview of all modulators that have been assigned and that modulate this specific parameter. This is again gives you instant access to all key modulation settings from one place.

Please Note: The Parameter View does not get displayed as long as the modulation Assign Mode is enabled.



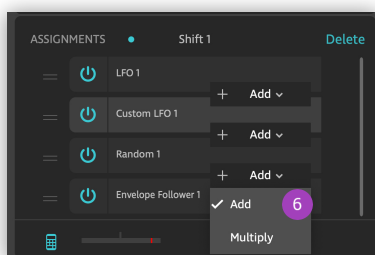
1.) Mute / Unmute: Enables or disables the modulation for the specific parameter destination.

2.) Modulation Range: Increase or decrease the Range of the Modulation

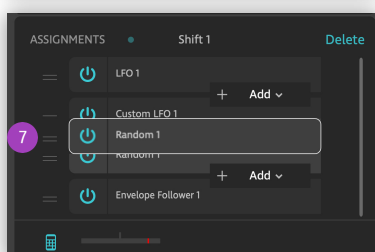
3.) Bipolar/Unipolar: Changes the Modulation from Positive - Negative to only Positive or Negative

4.) Blue Dot: Gives a visual feedback of the modulation speed for the currently selected modulator assignment tab.

5.) The red pointer indicates the final modulation signal after the calculation of all modulation sources. This is equal to the indicator on the selected parameter.



6.) Calculator Icon: By clicking the calculator icon you enable the multiplier/add mode for the modulator assignment tabs. In this mode you can choose whether the different modulation sources should be added or multiplied.



7.) Here you can grab and reorder the modulation assignments to allow a specific order for the calculation of the final modulation Signal.



## Host Automation:

If you want to use host automation to control a parameter you inside a modulator, you can do so by right clicking on the parameter. This opens the Automation Panel where you can Assign the parameter to a host automation slot of your choice. If you open the automation editor of your host, the chosen parameter will now appear in the list. All other parameters that are not part of the modulation system are already part of the host automation list with their appropriate label.

