MTurboComp

Overview

MTurboComp is an extremely powerful dynamics processor. It has been designed to be versatile, so that it can simulate any compressor out there, primarily the vintage ones of course. It features 4 ultra-powerful followers, which you can be combined at will, 4 processors to build the transfer curve, a dynamic equalizer and 2 saturators. We then used machine analysis and learning to make the beast's response similar to the vintage compressors that we wanted to simulate.

MTurboComp provides emulations of **14 classic compressors/limiters**, plus several units that we designed, not necessarily compressors. All are available from the Devices list on the left-hand side. It doesn't stop there however. Many of the classic units had a really odd user interface, missing features etc. Therefore we created a **generalized compressor interface**, meaning that all of the simulations have almost the same controls and they also feature things that the originals didn't have, such as a side-chain detector EQ, saturation control etc. Hence using MTurboComp and comparing different models is very quick and easy.

Compressors are traditionally controlled via thresholds and ratios. In most character compression scenarios this is extremely difficult to use - the effect of each parameter changes the actual character and also it changes the output level, hence one needs to tweak the output gain at the same time to be able to compare whether the change is good. Using MTurboComp is entirely different. The initial settings of each simulation are set so that the compressor "is already doing something", so that you can hear how it actually sounds. All of them then feature the big **Compression** (in some emulations it has a different name) knob, which lets you increase or decrease the amount of compression and aims to change the output level as little as possible. They all provide a **Dry/Wet** knob for parallel compression. And also there's the big **Saturation** control, which defines the amount of saturation, higher harmonics and character to be applied.

How to use the compressor

We propose the following efficient way to use MTurboComp, which should speed up your workflow tremendously and make it accessible to beginners as well:
1. Select a compressor device that you like.
2. Use the **Gain In** knob to set the input level to some reasonable value if needed.
3. Adjust the attack/release settings if needed - e.g. if you want more attack to go through witohut compression etc. These define the compression character. It may be useful to over-compress the material first by increasing the **Compression** control, so that you can hear how it actually sounds in the extreme.
4. Change the amount of compression using **Compression** and **Dry/Wet** knobs to your liking.
5. Use the **Saturation** knob to adjust the amount of saturation, character and loudness.
6. Listen :).

If you are not certain that the results are satisfactory, switch to a different A-H preset (copying the current settings into the new preset if you wish) and try again. Then you can create and compare up to 8 settings easily.

More advanced features

Each compressor can be driven by the external side-chain (rather than the main input signal) via by enabling the **Side-chain input** button. Whatever the detected signal source, there are detector **HP and LP filters** used to focus the detection onto a particular frequency range, so you can control what the plugin is "listening to". For example, if you want it to respond to bass drum only, just set the low-pass to say 100Hz.

And there is also the **Detector EQ**, which provides an access to a peak-filter which processes the detector signal. So for example if you want the compressor to react mainly to a snare drum, set **Gain** high and **BW** very low (to make it target only a small region around the center frequency), then sweep the **Frequency** to the position where the compressor reacts to the snare drum as much as possible. Finally reset the **Gain** and **BW** to your liking.

Edit screen

One of the huge advantages of using MTurboComp is that you have direct access to how the compressor actually works. So if you are experienced enough and you just don't like "something" about the settings, you can just switch to the **Edit** screen and tweak any detail you want. But be careful before you do so, it's a very very deep plugin :).

MTurboComp vs. MTurboCompLE

MTurboComp comes in 2 licence editions - MTurboComp is the full licence, which gives you access to all features of the plugin and also to the multiband version MTurboCompMB. This full licence is also part of the MMixingFXBundle, MMasteringFXBundle, MTotalFXBundle and MCompleteBundle.

MTurboCompLE is a limited licence, which provides all the devices on the Easy screen. It doesn't let you use the multiband version or the Edit screen, hence you cannot design your own compressors. It should however be far more than enough for everyday mixing/mastering/production, it's like more than 14 compressors after all.

Easy screen vs. Edit screen

The plugin provides 2 user interfaces - an **easy screen** and an **edit screen**. Use the Edit button to switch between the two.

By default most plugins open on the **easy screen** (edit button released). This screen is a simplified view of the plugin which provides just a few controls. On the left hand side of the plugin you can see the list of available **devices / instruments** (previously called 'active presets'), that is, presets with controls. These controls are actually nothing more than multiparameters (single knobs that can control one or more of the plug-in's parameters and sometimes known as Macro controls in other plug-ins) and are described in more detail later. Each device may provide different controls and usually is intended for a specific purpose. The easy screen is designed for you to be able to perform common tasks, quickly and easily, without the need to use the advanced settings (that is, those available on the Edit screen).

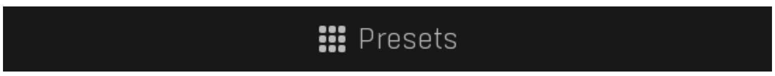
In most cases the devices are highlighted using different text colors. In some cases the colors only mark different types of processing, but in most cases the general rule is that **black/white devices** are the essential ones designed for general use. **Green devices** are designed for a specific task or audio materials, e.g. de-essing or processing vocals in a compressor plugin. **Red devices** usually provide some very special processing or some extreme or creative settings. In a distortion plugin, for example, these may produce an extremely distorted output. **Blue devices** require an additional input, a side-chain or MIDI input usually. Without these additional inputs these **Blue** presets usually do not function as intended. Please check your host's documentation about routing side-chain and MIDI into an effect plugin.

To the right of the controls are the meters or time-graphs for the plugin; the standard plugin Toolbar may be to the right of these or at the bottom of the plugin.

By clicking the **Edit button** you can switch the plugin to **edit mode** (edit button pushed). This mode provides all the of the features that the plugin offers. You lose no settings by toggling between edit mode and the easy screen unless you actually change something. This way you can easily check what is "under the hood" for each device, or start with an device and then tweak the plugin settings further.

Devices are factory specified and cannot be modified directly by users, however you can still make your own and store them as normal presets. To do so, configure the plugin as desired, then define each multiparameter and specify its name in its settings. You can then switch to the easy screen and check the user interface that you have created. Once you are satisfied with it, save it as a normal preset while you are on the easy screen. Although your preset will not be displayed or selected in the list of available devices, the functionality will be exactly the same. For more information about multiparameters and devices please check the **online video tutorials**.

If you are an advanced designer, you can also view both the easy and edit screens at the same time. To do that, hold **Ctrl** key and press the Edit button.



Presets

Presets button shows a window with all available presets. A preset can be loaded from the preset window by double-clicking on it, selecting via the buttons or by using your keyboard. You can also manage the directory structure, store new presets, replace existing ones etc. Presets are global, so a preset saved from one project, can easily be used in another. The arrow buttons next to the preset button can be used to switch between presets easily.

Holding **Ctrl** while pressing the button loads a random preset. There must be some presets for this feature to work of course.

Presets can be backed up by 3 different methods:
A) Using "Backup" and "Restore" buttons in each preset window, which produces a single archive of all presets on the computer.
B) Using "Export/Import" buttons, which export a single folder of presets for one plugin.
C) By saving the actual preset files, which are found in the following directories (not recommended):

Windows: C:\Users\{username}\AppData\Roaming\MeldaProduction
Mac OS X: /Library/Application support/MeldaProduction

Files are named based on the name of the plugin like this: "{pluginname}.presets", so for example MAutopan.presets or MDynamics.presets. If the directory cannot be found on your computer for some reason, you can just search for the particular file.

Please note that prior to version 16 a different format was used and the naming was "{pluginname}presets.xml". *The plugin also supports an online preset exchange. If the computer is connected to the internet, the plugin connects to our server once a week, submits your presets and downloads new ones if available. This feature is manually maintained in order to remove generally unusable presets, so it may take some time before any submitted presets become available. This feature relies on each user so we strongly advise that any submitted presets be named and organised in the same way as the factory presets, otherwise they will be removed.*

Left arrow
Left arrow button loads the previous preset.

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Randomize
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Panic
Panic button resets the plugin state. You can use it to force the plugin to report latency to the host again and to avoid any audio problems. For example, some plugins, having a look-ahead feature, report the size of the look-ahead delay as latency, but it is inconvenient to do that every time the look-ahead changes as it usually causes the playback to stop. After you tweak the latency to the correct value, just click this button to sync the track in time with the others, minimizing phasing artifacts caused by the look-ahead delay mixing with undelayed audio signals in your host. It may also be necessary to restart playback in your host.
Another example is if some malfunctioning plugin generates extremely high values for the input of this plugin. A potential filter may start generating very high values as well and as a result the playback will stop. You can just click this button to reset the plugin and the playback will start again.

Settings
Settings button shows a menu with additional settings of the plugin. Here is a brief description of the separate items.

Licence manager lets you activate/deactivate the plugins and manage subscriptions. While you can simply drag & drop a licence file onto the plugin, in some cases there may be a faster way. For instance, you can enter your user account name and password and the plugin will do all the activating for you.

There are 4 groups of settings, each section has its own detailed help information: **GUI & Style** enables you to pick the GUI style for the plug-in and the main colours used for the background, the title bars of the windows and panels, the text and graphs area and the highlighting (used for enabled buttons, sliders, knobs etc).

Advanced settings configures several processing options for the plug-in.

Global system settings contains some settings for all MeldaProduction plugins. Once you change any of them, restart your DAW if needed, and it will affect all MeldaProduction plugins.

Dry/Wet affects determines, for Multiband plug-ins, which multiband parameters are affected by the Global dry/wet control.

Smart interpolation adjusts the interpolation algorithm used when changing parameter values; the higher the setting the higher the audio quality and the lower the chance of zippering noise, but more CPU will be used.

WWW
WWW button shows a menu with additional information about the plugin. You can check for updates, get easy access to support, MeldaProduction web page, video tutorials, Facebook/Twitter/YouTube channels and more.

Sleep indicator
Sleep indicator informs whether the plugin is currently active or in sleep mode. The plugin can automatically switch itself off to save CPU, when there is no input signal and the plugin knows it cannot produce any signal on its own and it generally makes sense. You can disable this in Settings / **Intelligent sleep on silence** both for individual instances and globally for all plugins on the system.

Reload
Reload button reloads the device and sets all non-locked controls in the current device to their default values. It may be useful, since the plugin stores current settings when switching between the devices, hence this button is a quick and easy way to get the defaults for the devices, before you changed them. If you want to reload all parameters for the device, you must unlock the Easy screen locks or disable them all by turning off the On/Off button in the Global Locking panel in Edit mode.

Device selector

Device selector lets you choose from the predefined devices (previous 'active presets'). These are different from normal presets as they can actually have Easy-mode controls available via knobs or buttons. Click on an device to load it. Check out our video tutorials for information about creating your own devices. Although you cannot put your own devices into this selector, you can still save them as normal presets and on loading they will work in the exactly same way.
When browsing the devices, the plugin stores the control values (multiparameters). It doesn't store the full settings, only the multiparameters, so that if you switch between the devices, your settings will be kept intact, unless you switch to edit screen and perform some advanced editing, in which case it is recommended to use the A-H presets to store your work.

Collapse

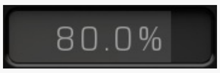
Collapse button minimizes or enlarges the panel to release space for other editors.

Meldei 1176

This sounds like one of the worlds best known compressors. But it is not just an 1176.
We have added controls that give this compressor much more versatility.
It is the go-to compressor for just about everything.
Best on: Vocals, Guitars, Synths, Drums

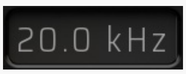
Side-chain input

Side-chain input switch enables the input from the side-chain input for level detection. Normally the compression is driven by the actual input signally that you are processing. By enabling this option, you can send any signal to the plugin's side-chain and the plugin will measure its level instead.



Detector EQ BW

Detector EQ BW controls the bandwidth (or Q) of the peak filter used to pre-process the signal for level detection. The higher the value, the wider the region that the filter affects around the center frequency will be. You can use it to make the compressor more focused on certain part of the spectrum or conversely to ignore it.

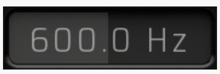


LP

LP controls the low-pass filter's frequency, which you can use to remove the higher frequencies from the level detector's input. For example, when processing mixed drums, you may set this low enough to detect and therefore compress the bass drum while keeping the rest of the drums intact (unless they are hit at the same time of course).

HP

HP controls the high-pass filter's frequency, which you can use to remove the lower frequencies from the level detector's input. For example, when processing mixed drums, you may set this high enough to detect and therefore compress the snare drum while keeping the bass drum intact (unless they are hit at the same time of course).



Detector EQ Frequency

Detector EQ Frequency controls the center frequency of the peak filter used to pre-process the signal for level detection. You can use it to make the compressor more focused on a certain part of the spectrum or conversely to ignore it.

Detector EQ Gain

Detector EQ Gain controls the gain of the peak filter used to pre-process the signal for level detection. You can use it to make the compressor more responsive to a certain part of the spectrum or conversely to ignore it.

Release

Release defines the release time, that is how quickly the level detector decreases the measured input level. Let's say we are processing a snare drum with a compressor. Then the longer the release is, the longer it takes for the level follower to decrease the level below the threshold, hence the longer the compressor keeps working after the snare drum's initial transient, when the actual sound is already decaying. Longer release times usually provide more natural distortion-free results, however for character compression it is often better to keep it shorter, otherwise the compressor becomes too "steady", sounding like "it is not doing much".

Attack

Attack defines the attack time, that is how quickly the level detector increases the measured input level. Let's say we are processing a snare drum with a compressor. Then the longer the attack is, the longer it takes for the level follower to increase the level above the threshold (and so trigger compression), hence the more of the snare drum's initial transient passes through intact. Conversely if you set the attack to the minimum, the level follower will be as fast as possible, most likely squashing the entire initial transient.

Ratio

Ratio defines the compression ratio of the input signal above the threshold. The higher the ratio, the more compression you get.

Output

Output defines the gain applied to the output signal. Please note that **Dry/Wet** changes the effect of this gain, hence you should set dry/wet to maximum first, then use this **output gain** to make sure that the level of the output matches the input if needed, and finally you can use dry/wet to blend between the input and the output (parallel, or "New York", compression) without being distracted by loudness differences.

Input

Input defines the gain applied to the incoming signal. It is the very first stage and is applied to the potential side-chain signal for detection purposes as well. Please note that **Dry/Wet** does NOT change the effect of this gain.

Saturation

Saturation controls the amount of analog-style saturation, which can add additional character to the signal and usually increases loudness.

Compression

Compression controls the relative amount of compression. Before using this control, make sure that you have set the input level and compressor parameters properly first. Then you can use this control to alter the amount of compression. In other compressors you would normally do using **Input gain** or **Threshold** parameters. But then you would need to compensate for the loudness difference using **Output gain**, making the whole process very complex, time consuming and prone to error. Instead, the **Compression** control has been implemented to minimize the loudness difference, so you can focus on the sonic qualities of the compressor without being fooled by your own ears.

Dry/Wet

Dry/Wet defines the ratio between dry and wet signals for the compressor. 100% means fully processed, 0% means no processing at all.

This feature essentially provides a modern way to do so-called parallel (or 'New York') compression. Essentially there are main 2 approaches to compression - A) set the threshold high, so that it affects everything above it, B) set the threshold low and use dry/wet to actually lower the effect of compression, which provides an easy way to control the amount of compression without too much editing of the more advanced parameters. Please note that lowering ratio does NOT have the same effect as lowering dry/wet in most cases.

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Time graph

Time graph button switches between the metering view and the time-graphs. The metering view provides an immediate view of the current values including a text representation. The time-graphs provide the same information over a period of time. Since different time-graphs often need different units, only the most important units are provided.

Pause

Pause button pauses the processing.

Popup

Popup button shows a pop-up window and moves the whole metering / time-graph system into it. This is especially useful in cases where you cannot enlarge the meters within the main window or such a task is too complicated. The pop-up window can be arbitrarily resized. In metering mode it is useful for easier reading from a distance for example. In time-graph mode it is useful for getting higher accuracy and a longer time perspective.

Enable

Enable button enables or disables the metering system. You can disable it to save system resources.

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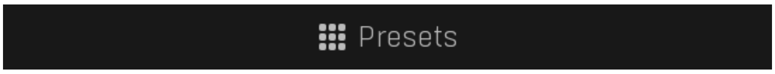

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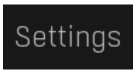

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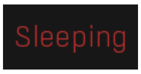

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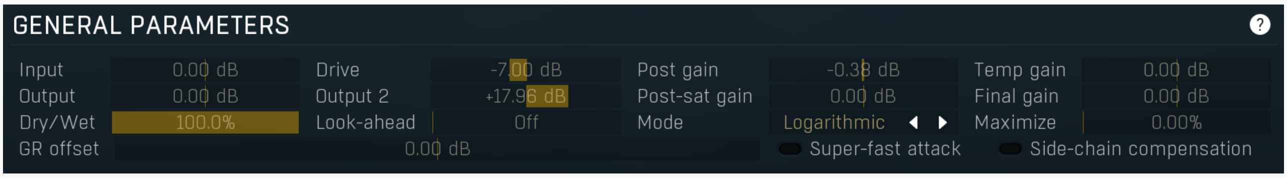
General parameters panel



General parameters panel contains the main parameters, such as input/output gain.

Input gain

Input gain defines gain applied to the incoming signal. It is the completely first stage and is applied to the potential side-chain signal for detection purposes as well. **Dry/Wet** takes the source after this gain, hence changing dry/wet does NOT change the effect of this gain.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Drive

Drive defines gain applied to the incoming signal before the follower section. Unlike **Input gain** this one gets negated by **Dry/Wet**.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Post gain

Post gain defines gain applied to the incoming signal, but it does NOT affect the follower section. Instead, it processes the follower output, hence it still affects the level, but it does not affect the behaviour of level. There could be a very big difference between the **Input gain** and Post gain if automatic modes or some more complex follower settings are used. In these cases the level often defines the actual behaviour of the level detector.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Temp gain

Temp gain defines the temporary gain applied to the input signal and then reversed on the output. You can achieve the same effect by setting **Input gain** to a value **G** and **Output gain** to value **-G**. Moreover, this plug-in tries to approximate the gain reduction. Absolutely accurate approximation is not possible; however when you set the parameters so that the level is touching the threshold with temporary gain at 0dB, then any change to the temporary gain should change the amount of compression but keep the output level stable. Therefore the temporary gain in fact controls **amount of compression**.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Output gain

Output gain defines the gain applied to the output signal.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Output gain 2

Output gain 2 has the same effect as **Output gain** and is available simply for convenience when designing devices.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Post-sat gain

Post-sat gain is a gain applied after the saturators, before the dry/wet processing. It's provided for convenience.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Final gain

Final gain is a the final stage of the plugin, applied after the dry/wet.
Range: -40.00 dB to +40.00 dB, default 0.00 dB

Dry/Wet

Dry/Wet defines the ratio between dry and wet signals. 100% means fully processed, 0% means no processing at all.
This feature essentially provides a modern way to do so-called parallel (or 'New York') compression. Essentially there are main 2 approaches to compression - A) set the threshold high, so that it affects everything above it, B) set the threshold low and use the dry/wet ratio control to reduce the effect of compression, which provides an easy way to control the amount of compression without too much editing of the more advanced parameters. Please note that lowering the ratio does NOT have the same effect as lowering dry/wet in most cases.
Range: 0.00% to 100.0%, default 100.0%

Look-ahead

Look-ahead delays the actual signal being processed, but keeps the detector signal intact. This makes the processor use a signal that has not actually arrived for dynamic calculation. This allows the processor to respond even faster, in fact, ahead of time. This feature is useful for mastering, however it naturally induces latency.
Look-ahead can be available in milliseconds (with obvious meaning) or in percentages. In percentages the look-ahead delay is computed automatically based on the attack and hold times. For example, if look-ahead is 100%, attack time 2ms and peak hold 10ms, then the look-ahead is 10ms; 60% look-ahead would be 7.2ms. If the look-ahead is simply an on/off switch, then it is toggling between 0% and 100% values.

Before using look-ahead, you should understand what such a feature does exactly as the results can potentially be damaging to your audio. Look-ahead basically moves the signal back in time, in other words its signal detector measures the input levels ahead of time. This means that when the detector is in the attack stage, the level is rising, the actual signal is not rising yet, but it will do so soon. However, the same applies to the release stage! When the detector moves to the release stage, the actual signal is not falling yet. This can lead to very strange artifacts (which can be used creatively of course).

The common way to fix this is to set the **release time** considerably higher than the **attack time**. In this way, the level will rise ahead of time in the attack stage, and same will happen for the release stage and the level will go down, however, since the level is falling slowly, the look-ahead will not be that relevant.

Another option is to use the **peak hold** feature. It is highly recommended to enable **true hold** in the advanced detector settings if available. Essentially this feature maximizes the input level over a certain period of time. *So for example, if you set look-ahead to 5ms and peak hold to 5ms as well, the actual signal will arrive 5ms later than the detector signal, however the peak hold feature will ensure that the detector holds the highest peaks for 5ms, so the attack stage will be ahead of time, but the release will not! You can consider it a form of latency compensation for the release stage.*

*Look-ahead is commonly used in **limiters** along with very low (often 0ms) attack times to avoid distortion. With 0ms attack time the limiter is immediately following the input and when the level gets above 0dB, it turns it down to 0dB, so the attack stage is effectively being clipped. To avoid distortion produced by this effect, you can increase look-ahead and peak hold to the same value, say 1ms. As a result the attack stage occurs before it actually occurs, so the distortion is still present, but in much lower levels and usually is masked by the forthcoming transient.*
Range: Off to 1000 ms, default Off

Mode

Mode affects the processing shape. The plug-in features special non-linear transfer shapes which affect the way the signal is processed. **Logarithmic** produces classic dynamic processing where a signal exceeding the threshold by 10dB at a compression ratio of 2 : 1 produces 5dB attenuation in output level. In this same scenario, **Squared** mode produces a slightly greater output attenuation of 6.4dB and **Linear** mode produces a still greater value of 7.5dB. Thus, Squared and Linear modes produce progressively more compression / expansion. There is no compromise in sound quality between the different modes. Comparing the three modes, Linear mode requires the least amount of CPU power, and Logarithmic the most.

Maximize

Maximize controls the automatic output gain according to current processing shape. In most cases it is better to use the AGC feature and let the processor set the output gain automatically.
Range: 0.00% to 100.0%, default 0.00%

GR offset

GR offset is added to the gain reduction meter and serves as a compensation if the GR meter produces nonzero value for silence for example.
Range: -20.00 dB to +20.00 dB, default 0.00 dB

Super-fast attack
Super-fast attack ensures the level will never go below the threshold, allowing the dynamic processor to react as quickly as possible, even if **attack** time is higher than 0ms. This is specifically designed for compression and is incompatible with gating and any downwards processing. Note that if you use a soft knee, you may expect gain reduction even if the audio level is very low, or even silence for that matter.

Side-chain compensation
Side-chain compensation disables **Maximize** and **Output gain 2** features. This often gets handy when providing a switch for side-chain input, since the input level normally defines the compressor reaction, followed by the output gain compensation implemented using these 2 features. But when side-chain input is used, the input compensation doesn't make sense anymore and usually causes huge output levels. Enabling this option disables both of these features, which is usually sufficient for side-chain processing.

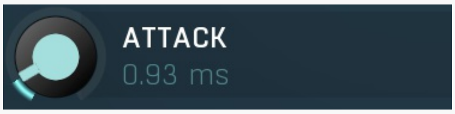
Followers tab
Followers tab contains all of the level followers the plugin provides with all their parameters and the way they are combined.

Follower panel

Follower panel contains the parameters defining how the plug-in determines the level of the source signal. Each follower operates on the original input or side-chain. Followers number 2 and higher provide additional features for combining their output with the current level generated by previous followers.

Copy
Copy button copies the settings onto the system clipboard.

Paste
Paste button loads the settings from the system clipboard.



Attack
Attack defines the attack time, that is how quickly the level detector increases the measured input level. When the input peak level is higher than the current level measured by the detector, the detector moves into the attack mode, in which the measured level is increased depending on the input signal. The higher the input signal, or the shorter the attack time, the faster the measured level rises. Once the measured level exceeds the **Threshold** then the dynamics processing (compression, limiting, gating) will start.

There must be a reasonable balance between attack and **release** times. If the attack is too long compared to the release, the detector will tend to keep the measured level low, because the release would cause that level to fall too quickly. In most cases you may expect the attack time to be shorter than the release time.

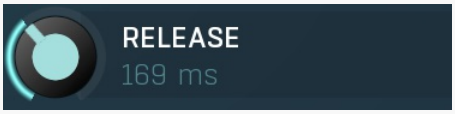
To understand the working of a level detector, it is best to cover the typical cases:

*In a **compressor** the attack time controls how quickly the measured level moves above the threshold and the processor begins compressing. As a result, a very short attack time will compress even the beginning transient of a snare drum for example, hence it would remove the punch. With a very long attack time the measured level may not even reach the threshold, so the compressor may not do anything.*

*In a **limiter** the attack becomes a very sensitive control, defining how much of the signal is limited and how much of it becomes saturated/clipped. If the attack time is very short, limiting starts very quickly and the limiter catches most peaks itself and reduces them, providing lower distortion, but can cause pumping. On the other hand, a higher attack setting (typically above 1ms) will let most peaks through the limiter to the subsequent in-built clipper or saturator, which causes more distortion of the initial transient, but less pumping.*

*In a **gate** the situation is similar to a compressor - the attack time controls how quickly the measured level can rise above the threshold at which point the gate opens. In this case you will usually need very low attack times, so that the gate reacts quickly enough. The inevitable distortion can then be avoided using look-ahead and hold parameters.*

In a modulator, the detector is driving other parameters, a filter cut-off frequency for example, and the situation really depends on the target. If you want the detector to react quickly on the input level rising, use a shorter attack time; if you want it to follow the flow of the input signal slowly, use longer attack and release times.
Range: 0 ms to 10000 ms, default 10.0 ms



Release

Release defines the release time, that is how quickly the level detector decreases the measured input level. The shorter the release time, the faster the response is. Once the attack stage has been completed, when the input peak level is lower than the current level measured by the detector, the detector moves into the release mode, in which the measured level is decreased depending on the input signal. The lower the input signal, or the shorter the release time, the faster the measured level drops. Once the measured level falls under the **Threshold** then the dynamics processing (compression, limiting, gating) will stop.

There must be a reasonable balance between **attack** and release times. If the attack is too long compared to release, the detector would tend to keep the level low, because release would cause the level to fall too quickly. Hence in most cases you may expect the attack time to be shorter than the release time.

To understand the working of a level detector, it is best to cover the typical cases:

*In a **compressor** the release time controls how quickly the measured level falls below the threshold and the compression stops. As a result a very short release time makes the compressor stop quickly, for example, leaving the sustain of a snare drum intact. On the other hand, a very long release keeps the compression working longer, hence it is useful to stabilize the levels.*

*In a **limiter** the release time keeps the measured level above the limiter threshold causing the gain reduction. Having a very long release time in this case doesn't make sense as the limiter would be working continuously and the effect would be more or less the same as simply decreasing the input gain manually. However too short a release time lets the limiter stop too quickly, which usually causes distortion as the peaks through the limiter to the subsequent in-built clipper or saturator. Hence release time is used to avoid distortion at the expense of decreasing the output level.*

*In a **gate** the situation is similar to a compressor - the release time controls how quickly the measured level can fall below the threshold at which point the gate closes. Having a longer release time in a gate is a perfectly acceptable option. The release time will basically control how much of the sound's sustain will pass.*

In a modulator, the detector is driving other parameters, a filter cut-off frequency for example, and the situation really depends on the target. If you want the detector to react quickly on the input level falling, use a shorter release time; if you want it to follow the flow of the input signal slowly, use longer attack and release times.
Range: 0 ms to 10000 ms, default 100 ms

Release min

Release min defines the minimum release time and is used with automatic release modes. Note that release min may actually be set higher than **Release**, in which case the behaviour depends on the selected release mode. If it is set at the original 0ms, the actual value equals to **Attack** parameter and it is at least 1ms to avoid unnecessary distortion.
Range: 0 ms to 10000 ms, default 0 ms

Auto speed

Auto speed defines how quickly the automatic release works. Specifically how much the release time increases/decreases per second. It is relevant only in **automatic** release modes. *For example if you set it to 5000ms, the release time will be able to increase by 1000ms in 5000ms, when incoming signal exceeds the lowest threshold.*
Range: 1.0 ms to 10000 ms, default 1000 ms

Release mode

Release mode defines how the plug-in performs when decreasing level. In **manual mode** this is based only on the **release time**, which is suitable for most cases when the signal has constant characteristics. Automatic release modes can adapt to signals with unstable characteristics.

Automatic and **Automatic fast** modes: the longer the level stays above the threshold, the longer the release time will be and thus, the longer it will take to move below the threshold and end the release stage. The idea is that if the input is loud for some time, it will most likely stay that way for some more time, hence it should be stabilized to avoid unnecessary temporary fluctuations, which could result in pumping.

Both automatic modes increase the release time when the input signal is above the threshold and vice versa. The speed of the increase depends on the **Auto speed** parameter. Automatic fast mode uses full speed immediately after crossing the threshold, automatic mode varies the speed according to the current signal level.

For example, when a guitarist plays softly, the level is low and fluctuates around the threshold and the release time gets slower. So the processor quickly responds to sudden changes. However, when the guitarist starts playing a solo, the level rises and, the longer the solo is, the longer the release time becomes, hence the response becomes slower avoiding unnecessary fluctuations (pumping) when the solo contains small silent sections.

Linear 1 and **Linear 2** modes: the higher the level is, the longer the release. The idea is that if the input is very loud, it will probably stay that way for some time, so it is wise to keep the levels up too. This is similar to the automatic modes, however the main factor is not how long the level is high, but how high it is.
Below the threshold the release time is the same as the attack time, above the threshold the release time rises from the attack time up to the specified release time parameter. Linear 1 mode usually provides higher release times than does Linear 2.

Opto mode: the higher the level is, the shorter the release. So this is kind of the opposite of linear modes. The idea is, that you are expecting short transients, which you wish to deal with. Normally the higher the level would get in such a transient, the longer it would take to get the level below the threshold, so, when used in a compressor for example, these transients would cause unnecessary compression in the sustain stage. The opto detector lowers the level quickly, minimizing the amount of compression in the sustain stage.

*For example, let's say you are compressing a full drumset, but there is a very dominant sharp and short hi-hat sound, so it is appropriate to have short release times. You would use **Opto** mode. But the rest of the drumset deserves a softer treatment, so you want to keep longer release times. Use one of the other modes.*

Peak hold

Peak hold defines the time that signal level detector holds its maximum before the release stage is allowed to start. As an example, you can imagine that when an attack stage ends there can be an additional peak hold stage and the level is not yet falling, before the release stage starts. This is true only when **true peak** mode is enabled (check the advanced detector settings if available).

It is often used in **gates** to avoid the gated level falling below the threshold too quickly, while having short release times. If you want the gate to close quickly, you need a short release time. But in that case the ending may be too abrupt and even cause some distortion. So you use the peak hold to delay the release stage.

It is also used along with **look-ahead** to avoid distortion in **limiters and compressors**. If you need a very short attack, the attack stage may be too quick and cause distortions. In limiters this attack time is often 0ms, in which case it becomes a clipper. Setting look-ahead and peak hold to the same value will make the detector move ahead in time, so that it can react to attack stages before they actually occur and yet hold the levels for the actual signal to come.
Range: 0 ms to 10000 ms, default 0 ms

RMS length

RMS length smoothes out the values of the input levels (not the input itself), such that the level detector receives the pre-processed signal without so many fluctuations. When set to its minimum value the detector becomes a so-called "peak detector", otherwise it is an "RMS detector".

When you look at a typical waveform in any editor, you can see that the signal is constantly changing and contains various transient bursts and separate peaks. This is especially noticeable with rhythmical signals, such as drums. Trying to imagine how a typical attack/release detector works with such a wild signal may be complex, at least. RMS essentially takes the surrounding samples and averages them. The result is a much smoother signal with fewer individual peaks and short noise bursts.

RMS length controls how many samples are taken to calculate the average. It stabilizes the levels, but it also causes a slower response time. As such it is great for mastering, when you want to lower the dynamic range in a very subtle way without any instabilities. However, it is not really desirable for processing drums, for example, where the transient bursts may actually be individual drum hits, hence it is usually recommended to use peak detectors for percussive instruments.

Note that the RMS detector has 2 modes - a simplified approximation is used by default, and a true RMS is processor can be enabled from the advanced settings (if provided). Both respond differently, neither of them is better than the other, they are simply different.
Range: Peak to 10000 ms, default Peak

Delay

Delay defines how much the follower output should be delayed. It is a powerful way to keep attacks intact or to combine multiple followers to get more complex responses for example.
Range: 0 ms to 10000 ms, default 0 ms

Link channels

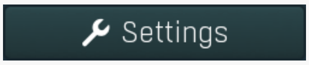
Link channels controls how much the signal level for each channel is controlled by the other channels. With 0% the link is disabled and each channel is not affected by the other channels at all. This is suitable to balance stereo channels, for example. With 100% the link is enabled and all channels are controlled by levels of all channels equally (that is the average level of those channels), therefore the processor will apply the same amount of processing on all channels. This is the default in most cases as it preserves relative levels between the channels.
Range: 0.00% to 100.0%, default 100.0%

Side-chain

Side-chain button activates the side-chain input as the source for level measurement.

Invert

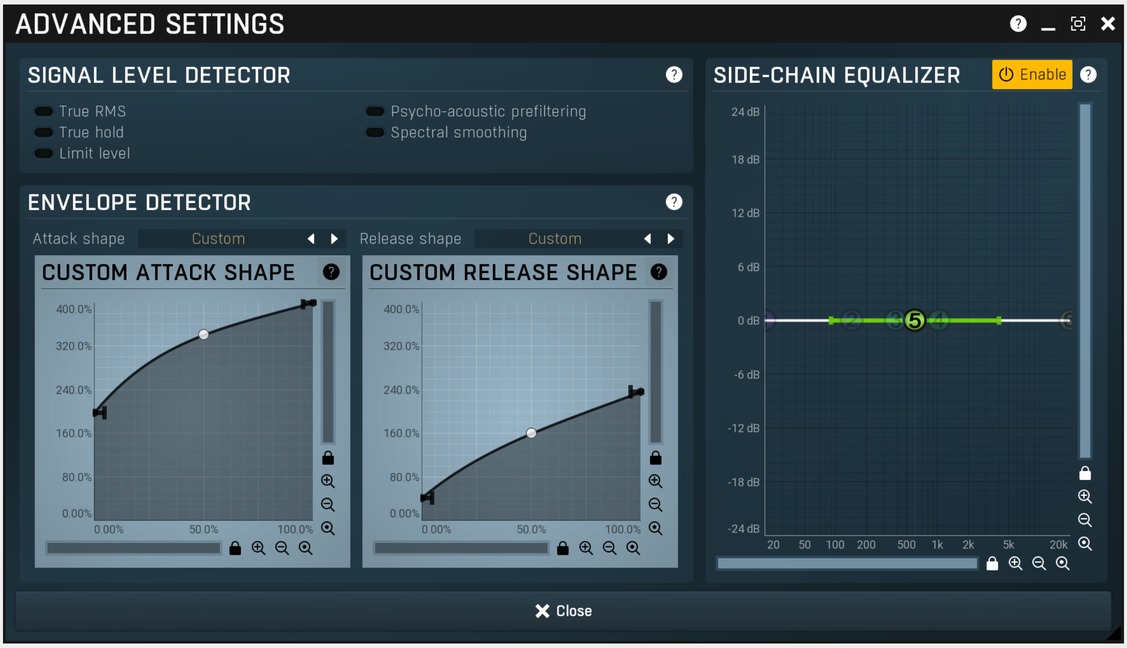
Invert switch inverts the envelope value from 'x' to '1-x', it may be useful creatively.



Settings

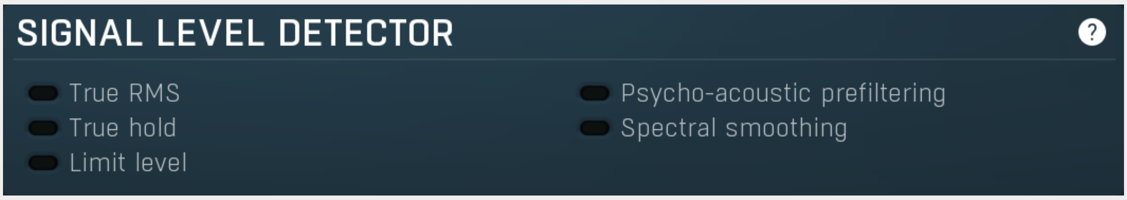
Settings button shows additional dynamics detector settings.

Advanced settings



Advanced settings contains more esoteric and advanced settings of the level detector. These include various kinds of detector signal preprocessing, attack & release responses and custom shapes, etc.

Signal level detector



True RMS

True RMS enables the true RMS calculation instead of the simplified approximation with a slightly different response. When disabled, the calculation is faster and requires almost no memory, however it is also inaccurate. This may not necessarily be a disadvantage, but it may be worth checking the true RMS processor, which provides the standard RMS calculation with the response you would expect. True RMS processing is not much slower than the approximated version, but requires a considerable amount of memory.

Psycho-acoustic prefiltering

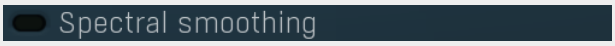
Psycho-acoustic prefiltering enables the loudness estimation pre-filtering processor. When disabled, the level detector reacts to the input level of the incoming signal. This is the traditional way, but it has nothing to do with human hearing, which reacts differently to different frequencies - our ears hear the different frequencies of equal loudness at different levels, being most sensitive to sounds between 2 and 5 kHz, (see the Fletcher-Munson curves, which are one of many sets of equal-loudness contours for the human ear) Psycho-acoustic pre-filtering pre-processes the level detection signal in a similar way to human hearing - it attenuates those frequencies we do not hear well and amplifies frequencies that we do. That way the level detector starts responding to what we actually hear, not to some sort of scientific signal as it usually does.
This feature is disabled by default simply because most users are not used to working with this feature, but it is perfectly safe to use it. However, do not use it with limiters, where you want to remove the peaks, hence you are not focussed on human hearing, but rather are dealing with the technological problems in digital and analog audio.

True hold

True hold enables the true peak hold algorithm. When disabled, hold is implemented using a special filter which catches peaks and maximizes the level detector signal input by those peaks. In time the peaks decrease in level according to the **hold** parameter. This is effective, requires almost no CPU and memory is required, but it is also inaccurate. For example, since the peaks are not keeping their levels, it cannot be used along with the **look-ahead** feature to avoid distortion in limiters.

True hold, on the other hand, implements the fastest currently-known algorithm to provide the true peak hold response; this does not decay in time and correctly tracks peaks. The typical use in limiters, for example, is to use the same **hold** and **look-**

aheadvalues - the **look-ahead** gives the limiter time and **hold** tracks the highest peaks ahead of the actual dynamic processing. This can highly improve the audio quality by removing unwanted distortion.



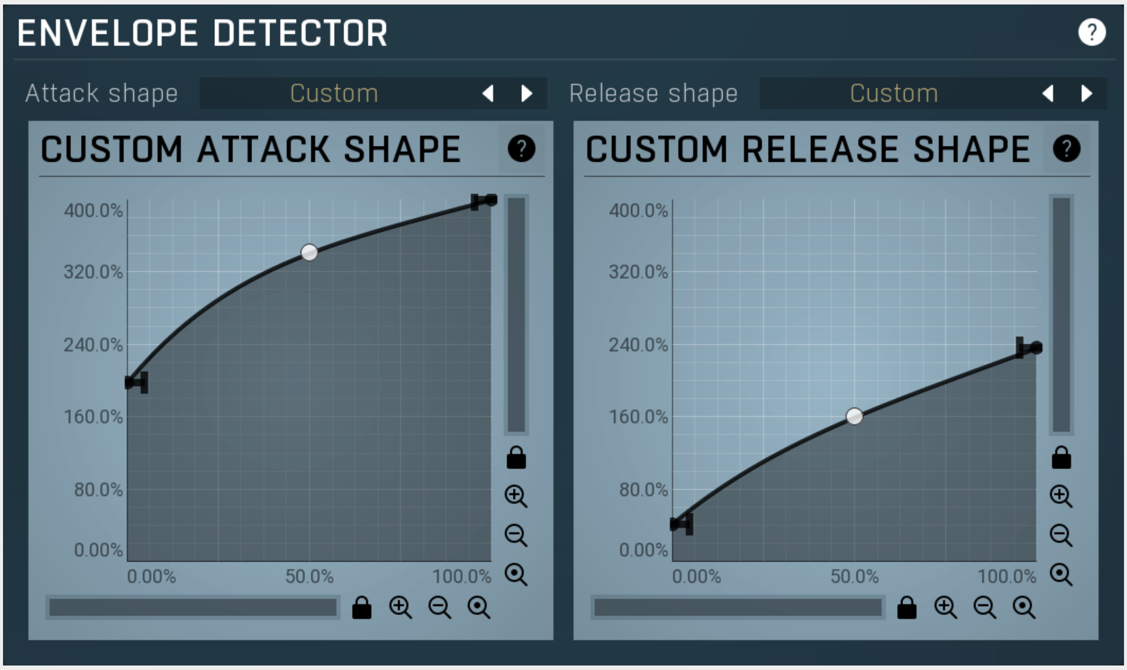
Spectral smoothing

Spectral smoothing enables special pre-processing of the level detector signal, aiming to further reduce distortion, especially with low attack values. This feature attempts to make the signal smoother by applying a complex filtering, which does not change the frequency levels. By doing so, you may expect a slower detector response. Limiters need to be extremely quick, hence it is not appropriate for them.

Limit level

Limit level option lets you limit the level detector output to 0dB. This may be handy when dealing with extremely high level inputs, far exceeding 0dB, which may cause the level follower end up "oversaturated" and not being able to lower the level under 0dB anymore. That could happen with several release modes.

Envelope detector



Attack shape

Attack shape controls the shape of the attack stage. The shape mainly affects the **ratio between pumping and distortion**, which simply cannot be avoided. Please note that the attack time parameter is quite dependent upon the mode, so you may expect differences in the actual attack time for different modes of the Attack shape.

Slow modes usually produce more pumping, but less distortion, as the detected level follows the input level more slowly. Conversely **Fast modes** reduce pumping, but cause more distortion. The type of the distortion is different between modes. You may actually profit from the distortion caused by some modes as the generated higher harmonics may enhance the audio. The default **Fast mode** provides a good compromise between distortion and pumping.

There are also **2 custom modes** available. With these modes you can actually draw the shape. Note that what you draw is NOT what you get. The custom shape graph converts the difference between the input level and the current detected level (as represented by the X-axis) into the speed of level detection (as represented by the Y-axis).

*For example, if you set the graph to show 100% across the X axis, then the results will be similar to the **Slow mode**. As the graph is flat, the speed of the detector is the same for all differences between the input and detected levels. If you then move the point on the right upwards to say 400%, it will mean that, if there is a big difference in the levels (a high X value), the detected level will follow the input level 400% faster than it normally would. The closer the detected level gets to the current audio level (a lower X value), the slower the change in the detected level. Similarly, if you take the point on the left and move it downwards to 0%, it will slow down the change to the detected level as it approaches the audio level (a low X value).*

Release shape

Release shape controls the shape of the release stage. The shape affects the **ratio between pumping and distortion**, which simply cannot be avoided. Please note that the release time parameter is quite dependent on the mode, so you may expect differences in actual release time for different modes of the Release shape.

Slow modes usually producemore pumping, but less distortion, as the detected level follows the input level more slowly. Conversely **Fast modes** reduce pumping, but cause more distortion. The type of the distortion is different between modes. You may actually profit from the distortion caused by some modes as the generated higher harmonics may enhance the audio. The default **Fast mode** provides a good compromise between distortion and pumping.

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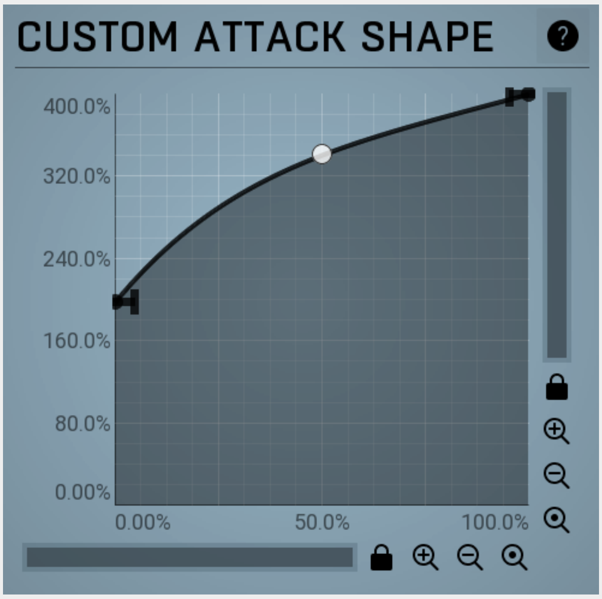
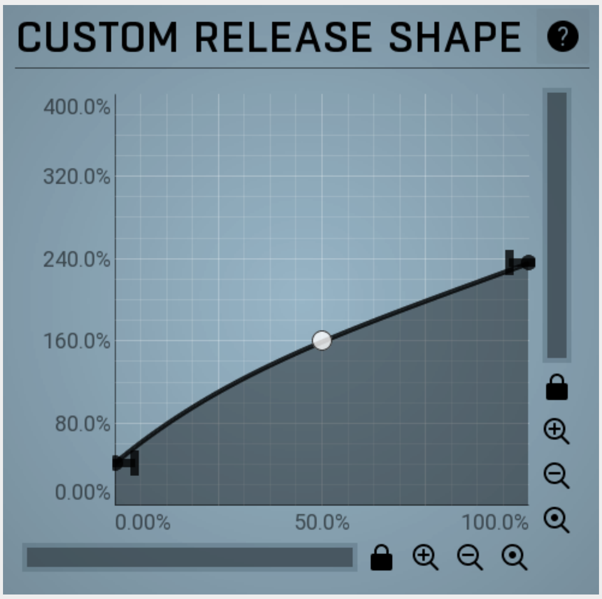


Custom attack shape

Envelope graph

Envelope graph provides an extremely advanced way to edit any kind of shape that you can imagine. An envelope has a potentially unlimited number of points, connected by several types of curves with adjustable curvature (drag the dot in the middle of each arc) and the surroundings of each point can also be automatically smoothed using the smoothness (horizontal pull rod) control. You can also literally draw the shape in drawing mode (available via the main context menu).

- **Left mouse button** can be used to select points. If there is a *point*, you can move it (or the entire selection) by dragging it. If there is a *curvature circle*, you can set up its tension by dragging it. If there is a *line*, you can drag both edge points of it. If there is a *smoothing controller*, you can drag its size. Hold **Shift** to drag more precisely. Hold **Ctrl** to create a new point and to remove any points above or below.
- **Left mouse button double click** can be used to create a new point. If there is a *point*, it will be removed instead. If there is a *curvature circle*, zero tension will be set. If there is a *smoothing controller*, zero size will be set.
- **Right mouse button** shows a context menu relevant to the object under the cursor or to the entire selection. Hold **Ctrl** to create or remove any points above or below.
- **Middle mouse button** drag creates a new point and removes any points above or below. It is the same as holding Ctrl and dragging using left mouse button.
- **Mouse wheel** over a point modifies its smoothing controller. If no point is selected, then all points are modified.
- **Ctrl+A** selects all points. **Delete** deletes all selected points.



Custom release shape

Envelope graph

Envelope graph provides an extremely advanced way to edit any kind of shape that you can imagine. An envelope has a potentially unlimited number of points, connected by several types of curves with adjustable curvature (drag the dot in the middle of each arc) and the surroundings of each point can also be automatically smoothed using the smoothness (horizontal pull rod) control. You can also literally draw the shape in drawing mode (available via the main context menu).

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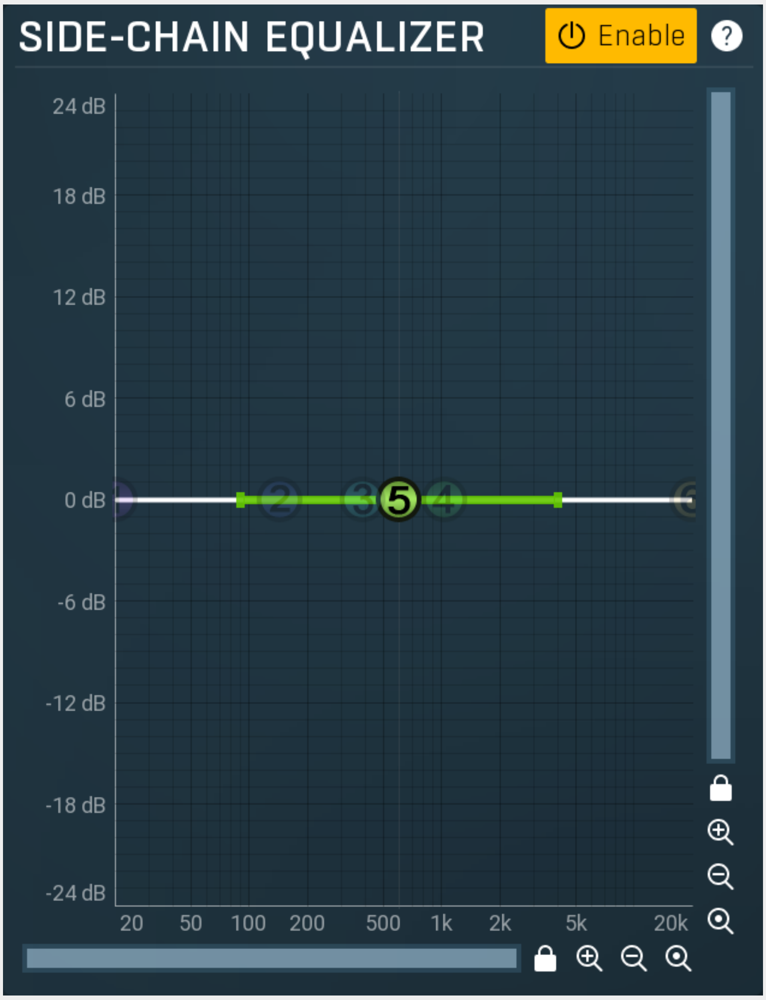
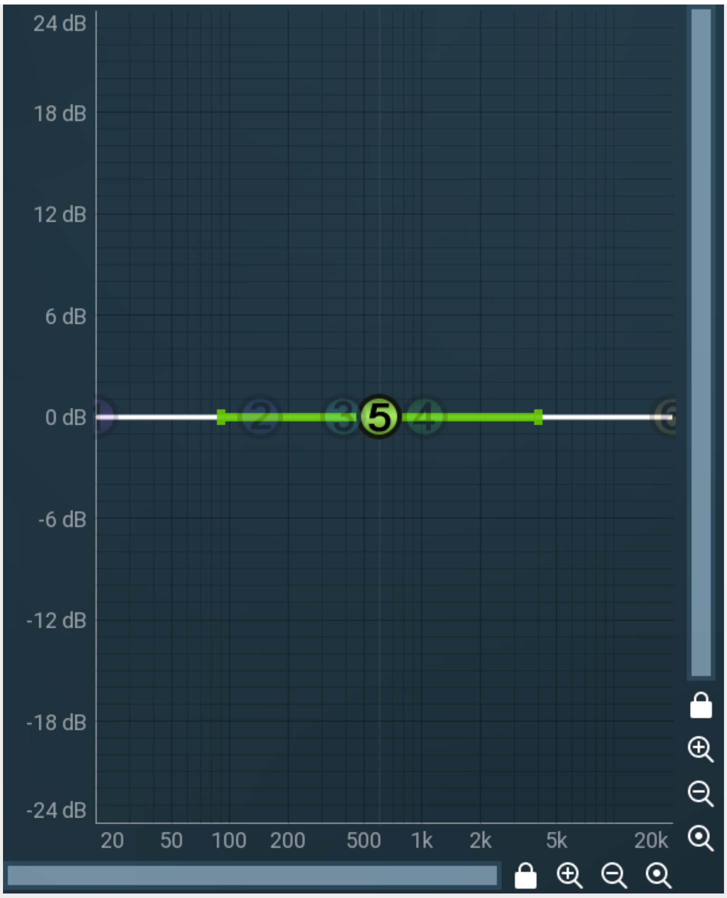
- **Right mouse button** shows a context menu relevant to the object under the cursor or to the entire selection. Hold **Ctrl** to create or remove any points above or below.
- **Middle mouse button** drag creates a new point and removes any points above or below. It is the same as holding Ctrl and dragging using left mouse button.
- **Mouse wheel** over a point modifies its smoothing controller. If no point is selected, then all points are modified.
- **Ctrl+A** selects all points. **Delete** deletes all selected points.

Side-chain equalizer



Enable

Enable button enables or disables the side-chain equalizer. It is disabled by default to lower CPU consumption.

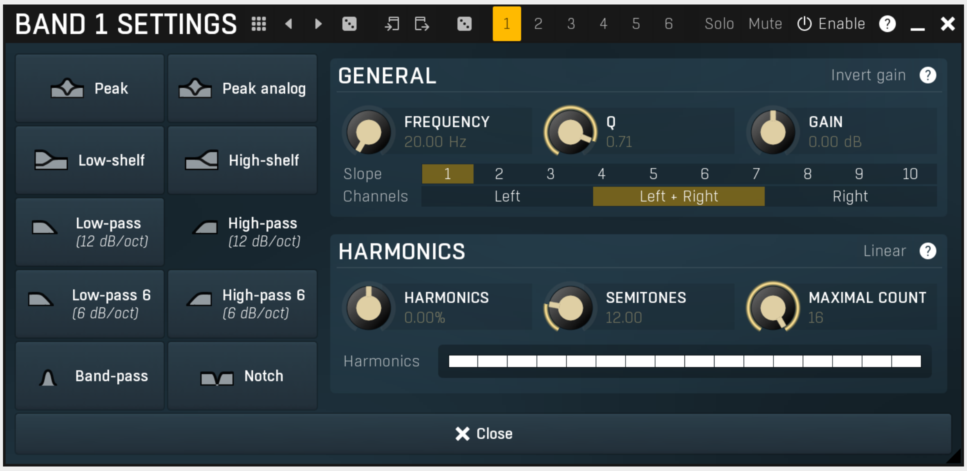


Equalizer shape graph

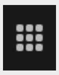
Equalizer shape graph controls and displays the frequency response. There are several bands available, each of them can be enabled/disabled, can be set to a different filter, can have different frequency, Q and other parameters.

Double-click on a band point to enable or disable a band. Drag it to change its frequency and gain. Drag the horizontal nodes to change its Q. Hold **ctrl** key for fine tuning. Click using the right mouse button on it to open a window with additional settings.

Band settings window

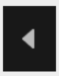


Band settings window contains settings for the particular band and can be displayed by right-clicking on a band or from a band list (if provided). On the left side you can see list of available filters, click on one to select it. On the right side, additional options and features are available.



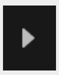
Presets

Presets button displays a window where you can load and manage available presets. Hold **Ctrl** when clicking to load a random preset instead.



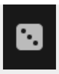
Left arrow

Left arrow button loads the previous preset.

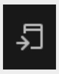


Right arrow

Right arrow button loads the next preset.

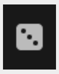


Randomize
Randomize button loads a random preset.



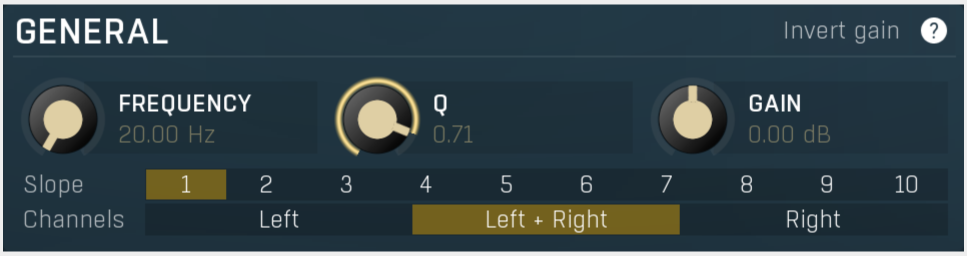
Copy
Copy button copies the settings onto the system clipboard.

Paste
Paste button loads the settings from the system clipboard.



Random
Random button generates random settings using the existing presets.

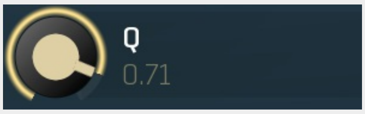
General panel



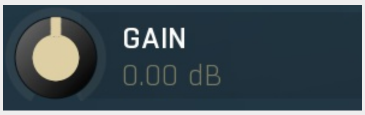
General panel contains standard filter settings such as frequency or Q. Most of these values are available directly from the band graph, but it may be necessary to use these controls for more accurate or textual access.

Invert gain
Invert gain inverts the gain of the band, e.g. makes -6dB from +6dB.

Frequency
Frequency defines the band's central frequency, which has different meaning depending of filter type.

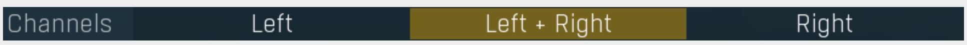


Q
Q defines bandwidth. Please note that Q is an engineering term and the higher it is, the lower the bandwidth. Our implementation is trying to be more user-friendly, and by increasing the value (thus to the right), the bandwidth is increased as well. The editor still displays the Q value correctly.



Gain
Gain defines how the particular frequencies are amplified or attenuated. This parameter is used only by peak and shelf filters.

Slope
Slope can potentially duplicate some of the filters creating steeper ones. By default, the slope is 1 and this usually means 2-pole 12 dB/octave filters. By specifying 2 you can make the plugin uses 4-pole 24 dB/octave filters instead etc. To see the actual slope of each filter look into the filter type list on the left.

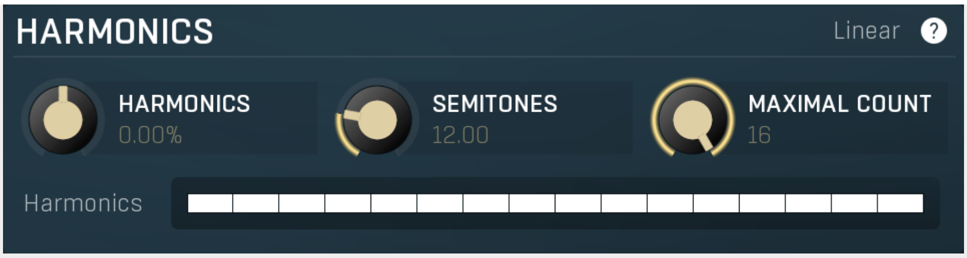


Channels
Channels controls which channels the band processes. If the input is stereo (left and right channels, L+R, selected on the toolbar **Channel mode** button), then you can make a band process only the left, only the right, or both channels. Similarly when the plugin is set to M/S channel mode, you can choose between mid, side or both channels.

When one of more bands are set to process a single channel, then 2 EQ curves are displayed, in red for the Left or Mid and in green for the Right or Side. If these are not distinct, then we recommend using a style with a light background for these graphs.

You cannot process left with one band and side with the other, because these are working in different encoding modes. In this case you can easily use 2 instances of the plugin in series, one in L/R mode and the other in M/S.

Harmonics panel



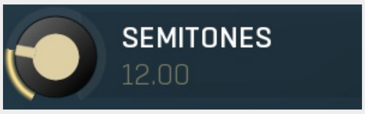
Harmonics panel contains parameters of the harmonics - clones of the main band created at higher frequencies derived from the frequency of the main band. This is often useful for removing natural noises, which usually bring some harmonics with them etc.

Linear

Linear button enables the linear harmonics spacing. When the main band frequency is say 100Hz and the **Semitones** value is 12, then in the default logarithmic mode the harmonics are 200Hz, 400Hz, 800Hz etc., increasing by 12 semitones (1 octave) each time. This is suitable because the filters themselves are logarithmic.
However harmonics generated by physical instruments are not spaced in this way. Rather, for a **Semitones** value of 12, they increase by a multiple of 12/12 of the main frequency each time. For example, for a base frequency of 100Hz, they will be at 200Hz, 300Hz, 400Hz, 500Hz etc. In linear mode the harmonics work in this way, but please note that then there is only a limited set of harmonics and Q is modified to approximate a reasonable behaviour, which is not always possible.

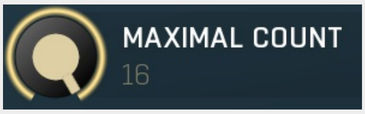
Harmonics

Harmonics defines the gain of the created harmonics. With maximum value (+/- 100%), all harmonics will have the same gain as the main band. A lower value makes the higher harmonics have lower gain. A negative depth will make alternate harmonics have positive and negative gains and is particularly useful for creative effects.



Semitones

Semitones defines the frequency interval of the harmonics. For example, if the band is at 100Hz and the number of semitones is 12 (default), then the first harmonic will be at 200Hz (12 semitones higher), second at 400Hz etc., increasing by 12 semitones (1 octave) each time. Thus they are logarithmically-spaced harmonics. When linearly-spaced harmonics are enabled, this merely changes the ratio between them. In this mode, 100Hz is followed by 200Hz, 300Hz, 400Hz, 500Hz etc, that is, increasing by a multiple of 12/12 of the main frequency each time.
For a value of 7 (a perfect fifth), the logarithmic harmonics would be at 150Hz, 225Hz, 337.5Hz, 506.25Hz etc, increasing by 7 semitones (= 50%, as 1.05946 ^ 7 = 1.498) each time and the linear harmonics would be at 158Hz, 251Hz, 397Hz, 628Hz etc, increasing by 7/12 each time.



Maximal count

Maximal count defines the maximum number of harmonics that could be created. The harmonics that are created depends on them being activated in the **Harmonics grid**.

Harmonics grid

Harmonics grid is useful to turn on/off particular harmonics manually. Click any one to enable / disable it.

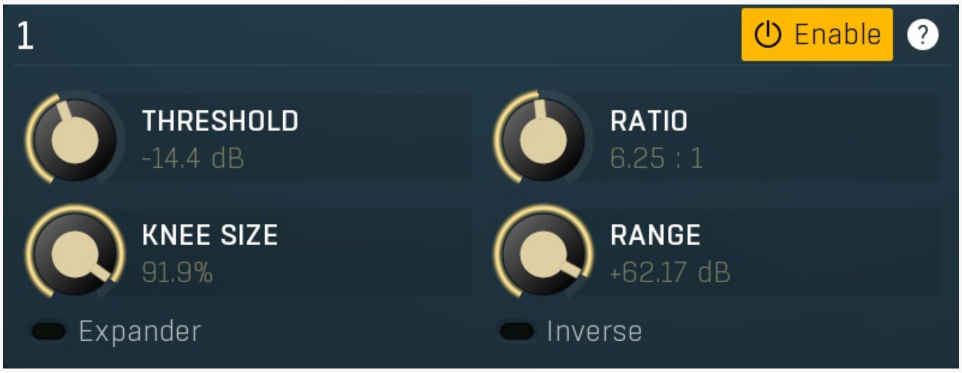
Input

Input button displays a transformation editor, which you can use to pre-process the input (the level of the signal to be detected) of the follower.

Level

Level button displays a transformation editor, which you can use to post-process the output (the detected level) of the follower.

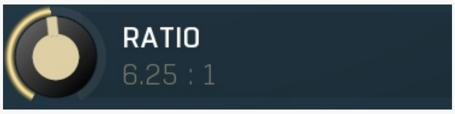
Processor panel



Processor panel contains parameters of the processor, which defines one segment in the transfer curve. It can behave like a compressor or expander.

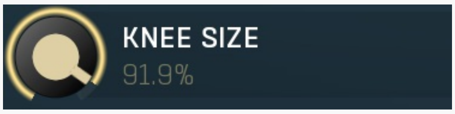
Threshold

Threshold determines the minimum signal level above which the compression effect starts to apply.
Range: -80.0 dB to 0.00 dB, default -12.0 dB



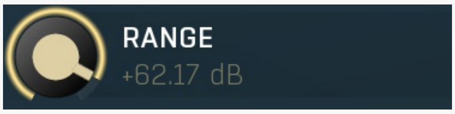
Ratio

Ratio defines the compression or expansion ratio of the input signal above the threshold.
Range: 1.00 : 1 to Infinity, default 4.00 : 1



Knee size

Knee size defines size of the knee smoothening the transfer curve.
Range: 0.00% to 100.0%, default 0.00%



Range

Range defines size of the interval above the threshold after which the original signal ratio is restored.
Range: +1.00 dB to Off, default Off

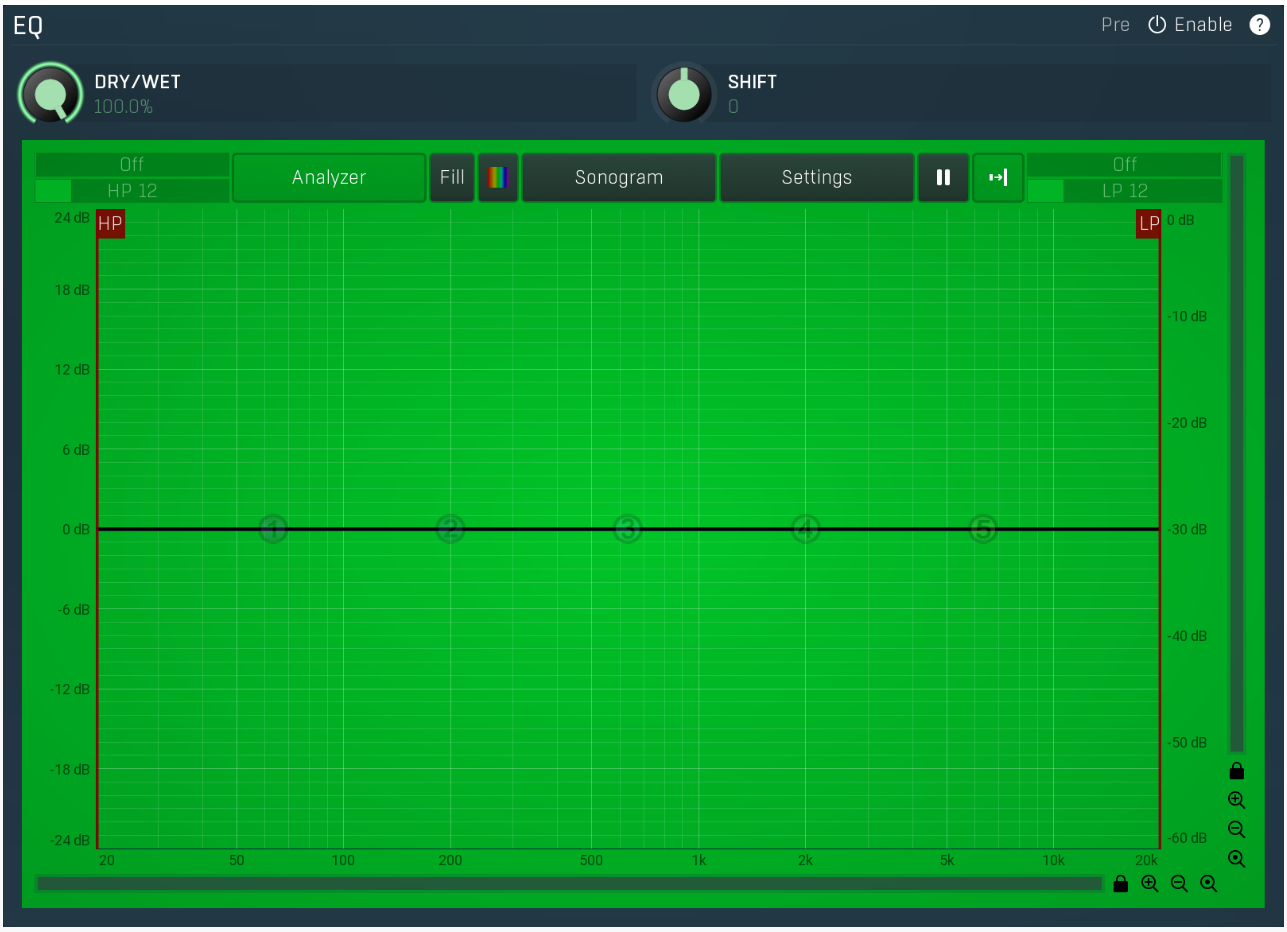
Expander

Expander switch changes the processor from compressor to expander.

Inverse

Inverse switch inverts the ratio creating a downwards curve. Note- that the ratio values then have a different meaning.

Equalizer panel



Equalizer panel contains the integrated dynamic equalizer you can use to pre-process the input or post-process the output.

Pre

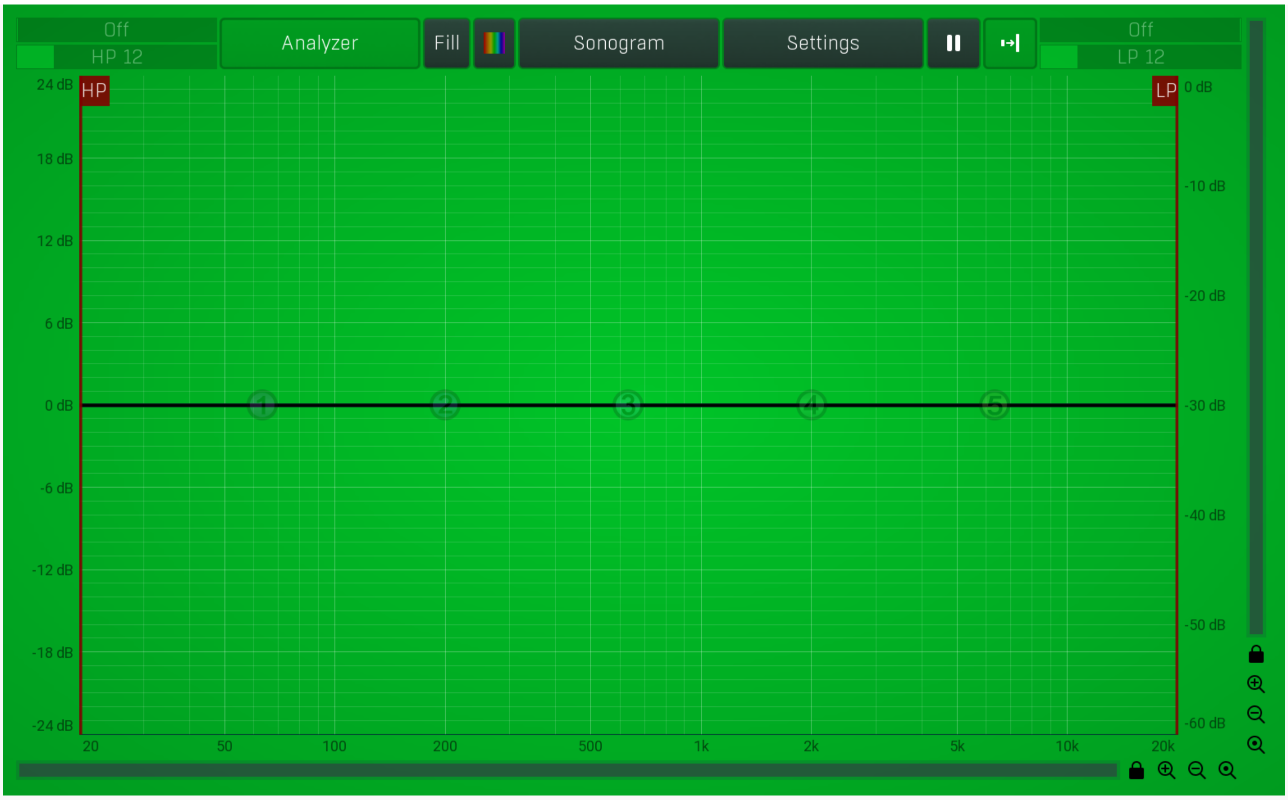
Pre switch makes the equalizer process the input signal before the input saturator. If this is switched off, it processes the output signal after the dynamics processing and before the otput saturator.

Dry/Wet

Dry/Wet defines ratio between dry and wet signals. 100% means fully processed, 0% means no processing at all. In normal mode only peak and shelf filters are affected correctly, other filters are left at 100% unless the ratio is set to 0%, in which case the equalizer is bypassed.
Range: 0.00% to 100.0%, default 100.0%

Shift

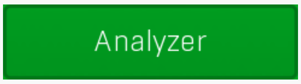
Shift lets you pitch shift all bands by specified number of semitones. It doesn't change the actual band points, but changes the resulting EQ shape appropriately.
Range: -24.00 to +24.00, default 0



Equalizer shape graph

Equalizer shape graph controls and displays the frequency response. There are several bands available, each of them can be enabled/disabled, can be set to a different filter, can have different frequency, Q and other parameters.

Double-click on a band point to enable or disable a band. Drag it to change its frequency and gain. Drag the horizontal nodes to change its Q. Hold **ctrl** key for fine tuning. Click using the right mouse button on it to open a window with additional settings.



Analyzer

Analyzer button enables or disables the spectrum analyzer, which shows the levels of individual frequencies. In most practical cases it is more convenient to use the sonogram, which shows the frequencies in time, but provides a lower level resolution as the levels are differentiated by color. The spectrum analyzer also provides a micro-sonogram (shown in the bottom of the panel) which uses the same color-based view as the sonogram.

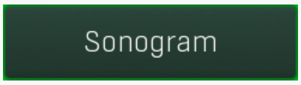
Fill

Fill button enables or disables the full-sized analyzer micro-sonogram. This means that the micro-sonogram at the bottom of the equalizer graph will fill the whole analyzer view. Color differentiation is often easier to understand than the classical spectrum analyzer, so this might help you better understand the spectrum of your audio material.

An alternative is to use the spectrum sonogram.

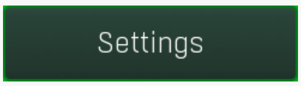
Analyzer Rainbow Colors

Analyzer Rainbow Colors lets you see the analyzed sound spectrum in beautiful colors, following the same style as visible light. It ranges from infra-red colors for the lowest frequencies to ultra-violet colors for the highest frequencies in the analyzed audio. If rainbow colors are disabled, the analyzer and graph will be single-colored, following the setup from Settings/Graphs.



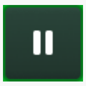
Sonogram

Sonogram button enables or disables the spectrum sonogram, which shows levels of individual frequencies in time. Levels are differentiated by color, so the accuracy is not as good as when using the spectrum analyzer. However, the time axis improves the visual orientation in the spectrum for typical audio signals. In contrast, the spectrum analyzer is more of a scientific tool.



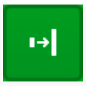
Settings

Settings button shows the settings of the spectrum analyzer and the spectrum sonogram.



Pause

Pause button stops the analyzer temporarily.

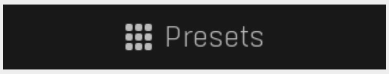


Normalize

Normalize button enables or disables the visual normalization, which makes the loudest frequency be displayed at the top of the analyser area (0dB); it does not normalise the sound. This is very useful for comparing frequency levels, however it does hide the actual level.
When comparing 2 spectrums you are usually interested mainly in the frequency level differences. In most cases both audio materials will have different overall levels, which would mean that one of the graphs would be "lower" than the other, making the comparison quite difficult. Normalize fixes this and makes the most prominent frequencies of the spectrum reach the top of the analyzer area (or have the most highlighted color in case of sonogram).

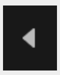
Band settings window

Band settings window contains settings for the particular band and can be displayed by right-clicking on a band or from a band list (if provided). On the left side you can see list of available filters, click on one to select it. On the right side, additional options and features are available.



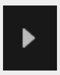
Presets

Presets button displays a window where you can load and manage available presets. Hold **Ctrl** when clicking to load a random preset instead.



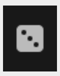
Left arrow

Left arrow button loads the previous preset.



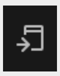
Right arrow

Right arrow button loads the next preset.



Randomize

Randomize button loads a random preset.

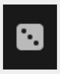


Copy

Copy button copies the settings onto the system clipboard.

Paste

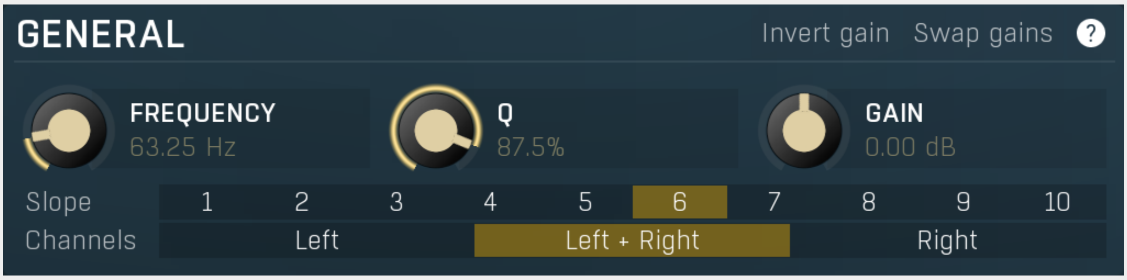
Paste button loads the settings from the system clipboard.



Random

Random button generates random settings using the existing presets.

General panel



General panel contains standard filter settings such as frequency or Q. Most of these values are available directly from the band graph, but it may be necessary to use these controls for more accurate or textual access.

Invert gain

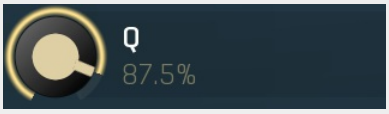
Invert gain inverts the gain of the band, e.g. makes -6dB from +6dB.

Swap gains

Swap gains button swaps values between gain and dynamics gain.

Frequency

Frequency defines the band's central frequency, which has different meaning depending of filter type.



Q

Q defines bandwidth. Please note that Q is an engineering term and the higher it is, the lower the bandwidth. Our implementation is trying to be more user-friendly, and by increasing the value (thus to the right), the bandwidth is increased as well. The editor still displays the Q value correctly.

Gain

Gain defines how the particular frequencies are amplified or attenuated. This parameter is used only by peak and shelf filters.

Slope

Slope can potentially duplicate some of the filters creating steeper ones. By default, the slope is 1 and this usually means 2-pole 12 dB/octave filters. By specifying 2 you can make the plugin uses 4-pole 24 dB/octave filters instead etc. To see the actual slope of each filter look into the filter type list on the left.

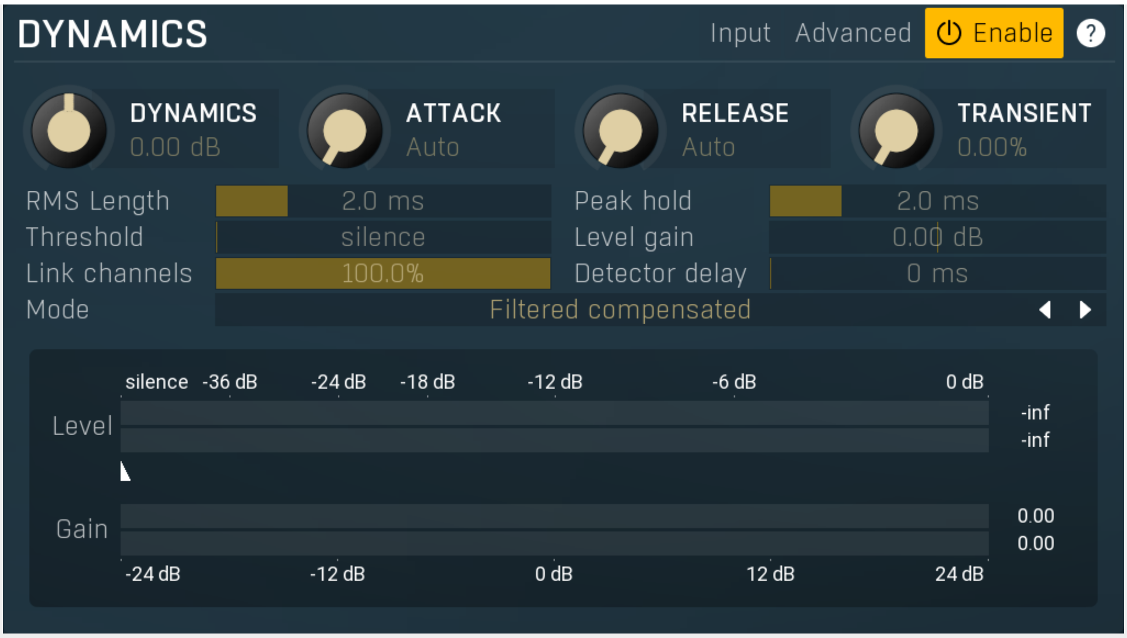
Channels

Channels controls which channels the band processes. If the input is stereo (left and right channels, L+R, selected on the toolbar **Channel mode** button), then you can make a band process only the left, only the right, or both channels. Similarly when the plugin is set to M/S channel mode, you can choose between mid, side or both channels.

When one of more bands are set to process a single channel, then 2 EQ curves are displayed, in red for the Left or Mid and in green for the Right or Side. If these are not distinct, then we recommend using a style with a light background for these graphs.

You cannot process left with one band and side with the other, because these are working in different encoding modes. In this case you can easily use 2 instances of the plugin in series, one in L/R mode and the other in M/S.

Dynamics panel



Dynamics panel contains settings of the dynamics processing which control how the filter behaves depending on input signal. Normal filters are static, meaning they don't change any features depending on the input signal. If you enable dynamic properties, by making the **dynamic gain** nonzero, the filter will start listening to the level of the input signal. This requires more CPU of course, as such a band is essentially an extremely complex generalized compressor, but the algorithms used are as efficient as it is technically possible.
A dynamic band varies the gain according to the input level. It can listen to the whole spectrum or to just part of it. By default it is driven by the partial spectrum, which it modifies itself, so, for example, when you have a high shelf, it is essentially listening to a high part of the spectrum. You can do many things with such a dynamic processor, but essentially it can work as a compressor or expander. There are many more advanced ideas that you can do and the full power hasn't really been explored yet.

Input

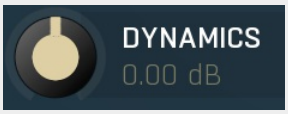
Input switch makes the band measure the input level instead of current level in the chain of bands. When this is disabled (default) and the equalizer is processing the bands serially, which means that each band is processing the output from the previous stage, including level measurement. If you enable this switch however, the dynamic processing will be driven by the original input signal instead.
Please note that when **Side-chain** is on, this switch has no meaning, since side-chain has priority.

Advanced

Advanced button displays additional settings for this band. These contain some more esoteric features, such as a dynamic transformation shape.

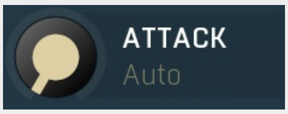
Enable

Enable button enables the dynamic processing. You can use it to switch between enabled and disabled dynamic processing to check the differences.



Dynamics

Dynamics defines the maximum gain of the filter that could be caused by the input signal. For example, if you set it to -24dB and the input signal contained in the band were very strong, the band will be set to an additional -24dB. This would work similarly to a compressor in that band.



Attack

Attack defines the attack time, that is how quickly the level detector increases the measured input level. When the input peak level is higher than the current level measured by the detector, the detector moves into the attack mode, in which the measured level is increased depending on the input signal. The higher the input signal, or the shorter the attack time, the faster the measured level rises. Once the measured level exceeds the **Threshold** then the dynamics processing (compression, limiting, gating) will start.

There must be a reasonable balance between attack and **release** times. If the attack is too long compared to the release, the detector will tend to keep the measured level low, because the release would cause that level to fall too quickly. In most cases you may expect the attack time to be shorter than the release time.

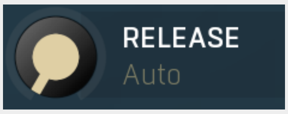
To understand the working of a level detector, it is best to cover the typical cases:

*In a **compressor** the attack time controls how quickly the measured level moves above the threshold and the processor begins* *compressing. As a result, a very short attack time will compress even the beginning transient of a snare drum for example, hence it would remove the punch. With a very long attack time the measured level may not even reach the threshold, so the compressor may not do anything.*

*In a **limiter** the attack becomes a very sensitive control, defining how much of the signal is limited and how much of it becomes saturated/clipped. If the attack time is very short, limiting starts very quickly and the limiter catches most peaks itself and reduces them, providing lower distortion, but can cause pumping. On the other hand, a higher attack setting (typically above 1ms) will let most peaks through the limiter to the subsequent in-built clipper or saturator, which causes more distortion of the initial transient, but less pumping.*

*In a **gate** the situation is similar to a compressor - the attack time controls how quickly the measured level can rise above the threshold at which point the gate opens. In this case you will usually need very low attack times, so that the gate reacts quickly enough. The inevitable distortion can then be avoided using look-ahead and hold parameters.*

In a modulator, the detector is driving other parameters, a filter cut-off frequency for example, and the situation really depends on the target. If you want the detector to react quickly on the input level rising, use a shorter attack time; if you want it to follow the flow of the input signal slowly, use longer attack and release times.



Release

Release defines the release time, that is how quickly the level detector decreases the measured input level. The shorter the release time, the faster the response is. Once the attack stage has been completed, when the input peak level is lower than the current level measured by the detector, the detector moves into the release mode, in which the measured level is decreased depending on the input signal. The lower the input signal, or the shorter the release time, the faster the measured level drops. Once the measured level falls under the **Threshold** then the dynamics processing (compression, limiting, gating) will stop.

There must be a reasonable balance between **attack** and release times. If the attack is too long compared to release, the detector would tend to keep the level low, because release would cause the level to fall too quickly. Hence in most cases you may expect the attack time to be shorter than the release time.

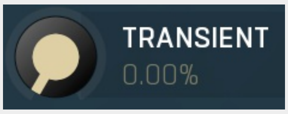
To understand the working of a level detector, it is best to cover the typical cases:

*In a **compressor** the release time controls how quickly the measured level falls below the threshold and the compression stops. As a result a very short release time makes the compressor stop quickly, for example, leaving the sustain of a snare drum intact. On the other hand, a very long release keeps the compression working longer, hence it is useful to stabilize the levels.*

*In a **limiter** the release time keeps the measured level above the limiter threshold causing the gain reduction. Having a very long release time in this case doesn't make sense as the limiter would be working continuously and the effect would be more or less the same as simply decreasing the input gain manually. However too short a release time lets the limiter stop too quickly, which usually causes distortion as the peaks through the limiter to the subsequent in-built clipper or saturator. Hence release time is used to avoid distortion at the expense of decreasing the output level.*

*In a **gate** the situation is similar to a compressor - the release time controls how quickly the measured level can fall below the threshold at which point the gate closes. Having a longer release time in a gate is a perfectly acceptable option. The release time will basically control how much of the sound's sustain will pass.*

In a modulator, the detector is driving other parameters, a filter cut-off frequency for example, and the situation really depends on the target. If you want the detector to react quickly on the input level falling, use a shorter release time; if you want it to follow the flow of the input signal slowly, use longer attack and release times.



Transient

Transient lets you mix the level follower output with a transient detector output. This lets you follow signal level, transients or both. Note that since transient level is usually lower than level detector's output, **Level gain** is only applied on the level detector's signal, so you can use this to compensate for the difference in level.

RMS length

RMS length smoothes out the values of the input levels (not the input itself), such that the level detector receives the pre-processed signal without so many fluctuations. When set to its minimum value the detector becomes a so-called "peak detector", otherwise it is an "RMS detector".

When you look at a typical waveform in any editor, you can see that the signal is constantly changing and contains various transient bursts and separate peaks. This is especially noticeable with rhythmical signals, such as drums. Trying to imagine how a typical attack/release detector works with such a wild signal may be complex, at least. RMS essentially takes the surrounding samples and averages them. The result is a much smoother signal with fewer individual peaks and short noise bursts.

RMS length controls how many samples are taken to calculate the average. It stabilizes the levels, but it also causes a slower response time. As such it is great for mastering, when you want to lower the dynamic range in a very subtle way without any instabilities. However, it is not really desirable for processing drums, for example, where the transient bursts may actually be individual drum hits, hence it is usually recommended to use peak detectors for percussive instruments.

Note that the RMS detector has 2 modes - a simplified approximation is used by default, and a true RMS is processor can be enabled from the advanced settings (if provided). Both respond differently, neither of them is better than the other, they are simply different.

Peak hold

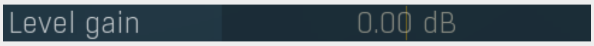
Peak hold defines the time that signal level detector holds its maximum before the release stage is allowed to start. As an example, you can imagine that when an attack stage ends there can be an additional peak hold stage and the level is not yet falling, before the release stage starts. This is true only when **true peak** mode is enabled (check the advanced detector settings if available).

It is often used in **gates** to avoid the gated level falling below the threshold too quickly, while having short release times. If you want the gate to close quickly, you need a short release time. But in that case the ending may be too abrupt and even cause some distortion. So you use the peak hold to delay the release stage.

It is also used along with **look-ahead** to avoid distortion in **limiters and compressors**. If you need a very short attack, the attack stage may be too quick and cause distortions. In limiters this attack time is often 0ms, in which case it becomes a clipper. Setting look-ahead and peak hold to the same value will make the detector move ahead in time, so that it can react to attack stages before they actually occur and yet hold the levels for the actual signal to come.

Threshold

Threshold controls the minimum level above which the dynamic gain actually starts working.

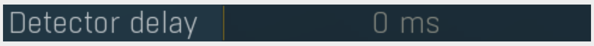


Level gain

Level gain controls the gain applied to the detector, which can be used for example when the input level is too low, so that dynamic processing would be negligible, unless the level is boosted.

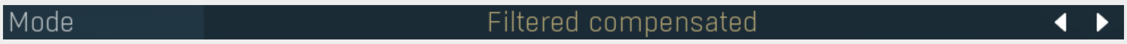
Link channels

Link channels controls how much the signal level for each channel is controlled by the other channels. With 0% the link is disabled and each channel is not affected by the other channels at all. This is suitable to balance stereo channels, for example. With 100% the link is enabled and all channels are controlled by levels of all channels equally (that is the average level of those channels), therefore the processor will apply the same amount of processing on all channels. This is the default in most cases as it preserves relative levels between the channels.



Detector delay

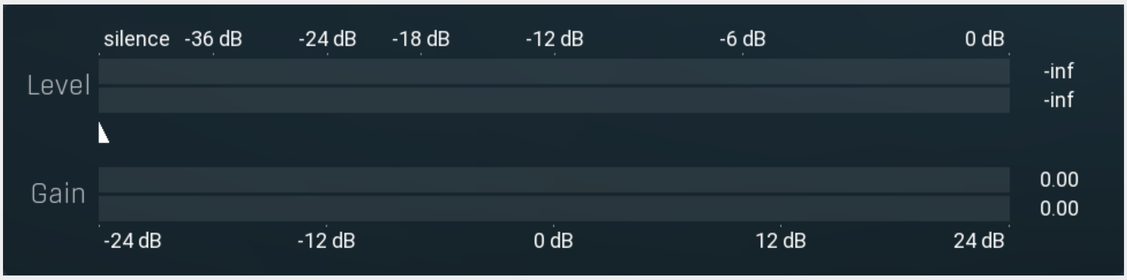
Detector delay lets you delay the detector input, hence the band will react later than the actual input signal.



Mode

Mode controls the way the band reacts to the input signal. It has no meaning if the dynamic gain is 0dB.
Filtered compensated mode is default and it means that the source for measuring input level is a filtered signal with additional compensation. For example, when using a low-shelf filter, the signal is low-passed with a filter with the same settings as the low-shelf, therefore the low-shelf filter is affected only by the signal the low-shelf is actually amplifying or attenuating. Since a low-passed signal with cut-off at 100Hz has usually a much lower level than the one filtered with cut-off at 10 kHz, additional compensation is performed to diminish these differences.
Filtered mode is similar, but the compensation is not performed. This may be advantageous for audio materials that do not contain the full spectrum, e.g. a bass line, where the compensation may make things complicated.
Entire spectrum mode is the simplest - it simply takes the input signal without any further processing. This may be useful for example to attenuate selected frequencies when the input level gets too high.

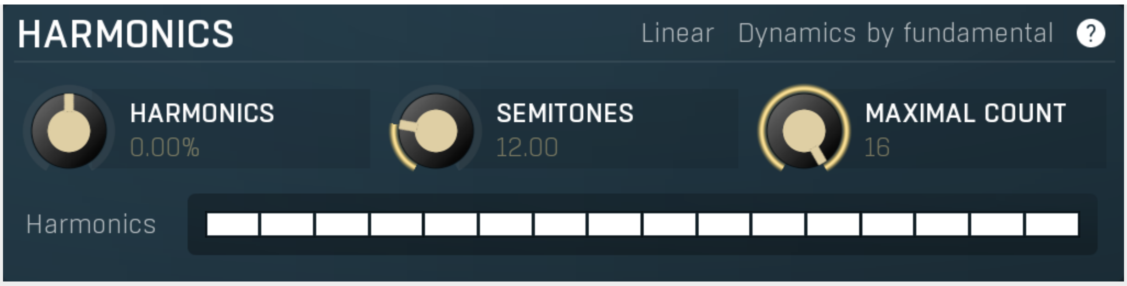
meters



Threshold

Threshold controls minimum level at which the dynamic gain actually starts working.

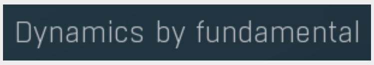
Harmonics panel



Harmonics panel contains parameters of the harmonics - clones of the main band created at higher frequencies derived from the frequency of the main band. This is often useful for removing natural noises, which usually bring some harmonics with them etc.

Linear

Linear button enables the linear harmonics spacing. When the main band frequency is say 100Hz and the **Semitones** value is 12, then in the default logarithmic mode the harmonics are 200Hz, 400Hz, 800Hz etc., increasing by 12 semitones (1 octave) each time. This is suitable because the filters themselves are logarithmic.
However harmonics generated by physical instruments are not spaced in this way. Rather, for a **Semitones** value of 12, they increase by a multiple of 12/12 of the main frequency each time. For example, for a base frequency of 100Hz, they will be at 200Hz, 300Hz, 400Hz, 500Hz etc. In linear mode the harmonics work in this way, but please note that then there is only a limited set of harmonics and Q is modified to approximate a reasonable behaviour, which is not always possible.

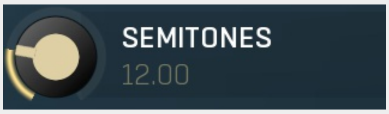


Dynamics by fundamental

Dynamics by fundamental switch causes each harmonic to be driven by the same detector settings as set for the main band. It is disabled by default, which means that each harmonic is literally a clone of the original filter and has its own dynamics detector depending on its own frequency.
Please note that if you want each harmonic to behave in exactly the same way as the main band, you also need to switch on the Input (at the top of the Dynamics panel), otherwise the harmonics would be measuring the signal processed by the main band.

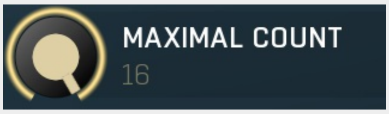
Harmonics

Harmonics defines the gain of the created harmonics. With maximum value (+/- 100%), all harmonics will have the same gain as the main band. A lower value makes the higher harmonics have lower gain. A negative depth will make alternate harmonics have positive and negative gains and is particularly useful for creative effects.



Semitones

Semitones defines the frequency interval of the harmonics. For example, if the band is at 100Hz and the number of semitones is 12 (default), then the first harmonic will be at 200Hz (12 semitones higher), second at 400Hz etc., increasing by 12 semitones (1 octave) each time. Thus they are logarithmically-spaced harmonics. When linearly-spaced harmonics are enabled, this merely changes the ratio between them. In this mode, 100Hz is followed by 200Hz, 300Hz, 400Hz, 500Hz etc, that is, increasing by a multiple of 12/12 of the main frequency each time.
For a value of 7 (a perfect fifth), the logarithmic harmonics would be at 150Hz, 225Hz, 337.5Hz, 506.25Hz etc, increasing by 7 semitones (= 50%, as 1.05946 ^ 7 = 1.498) each time and the linear harmonics would be at 158Hz, 251Hz, 397Hz, 628Hz etc, increasing by 7/12 each time.



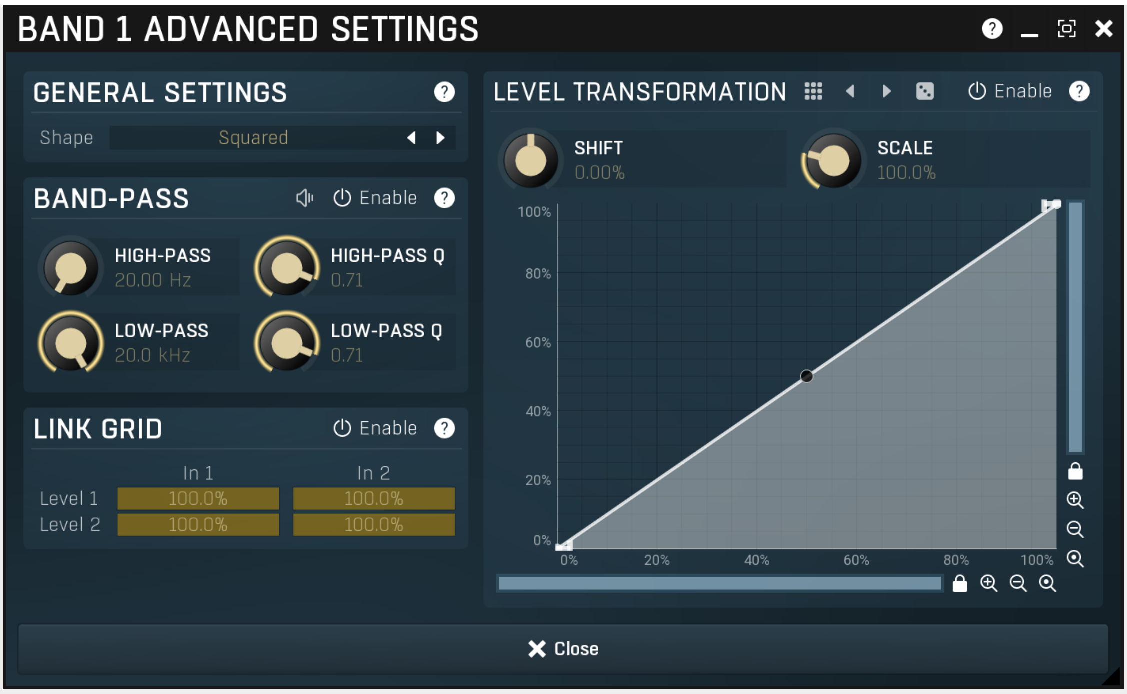
Maximal count

Maximal count defines the maximum number of harmonics that could be created. The harmonics that are created depends on them being activated in the **Harmonics grid**.

Harmonics grid

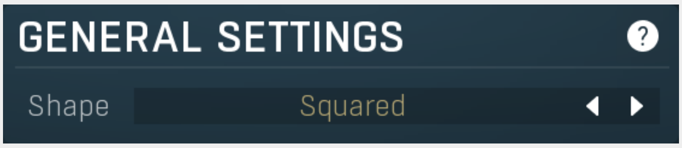
Harmonics grid is useful to turn on/off particular harmonics manually. Click any one to enable / disable it.

Band advanced settings

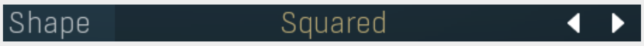


Band advanced settings contains additional settings for the band. These contain some more esoteric features, such as a dynamic transformation shape. It can be displayed by clicking the right mouse button on a band while holding **Ctrl**, from the basic band settings window, or from the band list if provided.

General settings panel



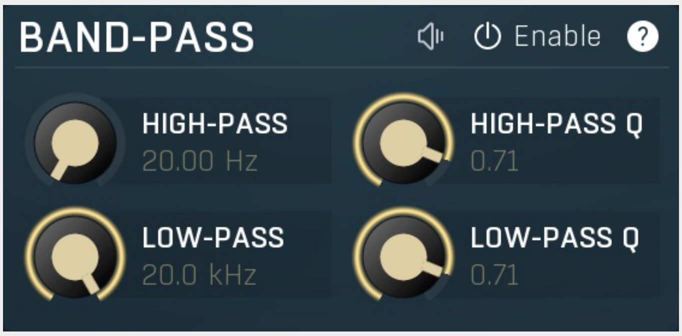
General settings panel contains additional parameters, which are too scientific to be available from the main band settings.



Shape

Shape affects the processing shape. The plug-in features specific non-linear transfer shapes which affect the way the level are interpreted. **Logarithmic** mode is the most physical one, increase from, say, -90dB to -80dB and from -10dB to 0dB produces the same difference in the output dynamic gain. However from the nature of it is tends to generate high gains and usually setting a threshold is needed. **Linear** mode on the other hand tends to stay near minimum gains and usually is the most aggressive. **Squared** mode is a compromise between these two. Comparing the three modes, Linear mode requires the least amount of CPU power and Logarithmic requires the most.

Band-pass panel



Band-pass panel contains parameters of the band pass, which you can use to process the signal that is used measure level of the band additionally. For example, you may want a band at high frequencies to react to bass content; you can do this by placing the band anywhere on the high frequencies and set the low-pass at say 200Hz.

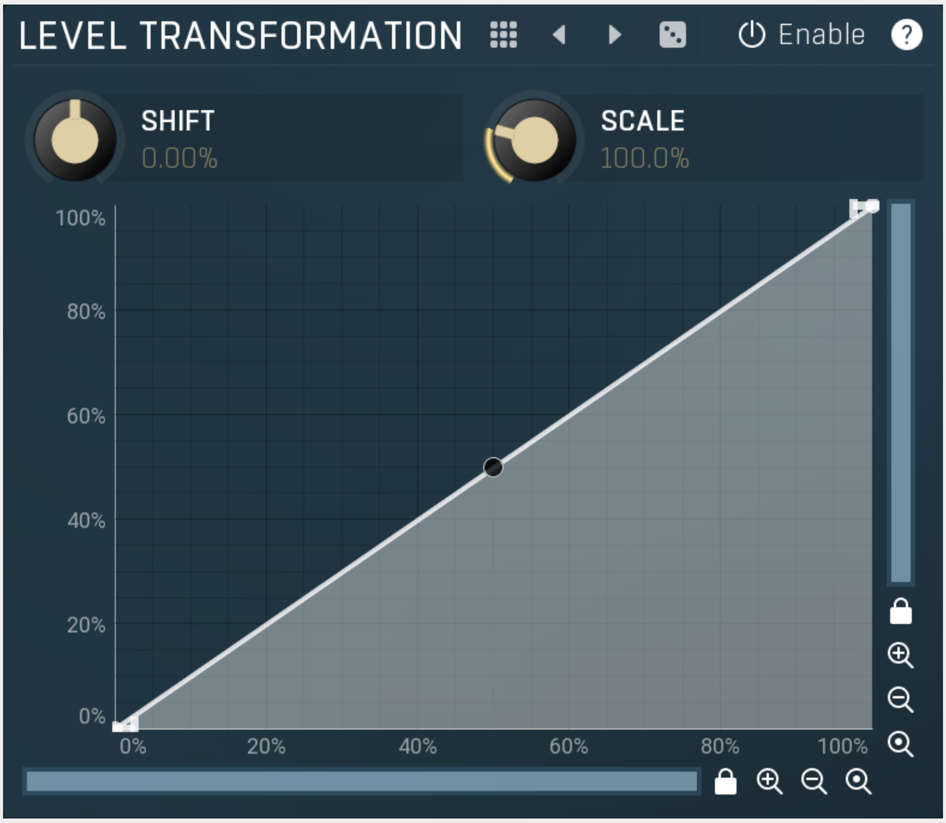
Play

Play button enables the band-pass monitoring and hence could be useful to tweak the band pass.

Enable

Enable button enables the band-pass module. It is off by default to save CPU resources.

Level transformation



Level transformation graph lets you transform the dynamic gain according to the input level. The X axis contains the input level; the Y axis controls the output level, which is then used to set the dynamic gain.

Presets

Presets button displays a window where you can load and manage available presets. Hold **Ctrl** when clicking to load a random preset instead.

Left arrow

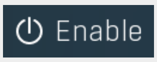
Left arrow button loads the previous preset.

Right arrow

Right arrow button loads the next preset.

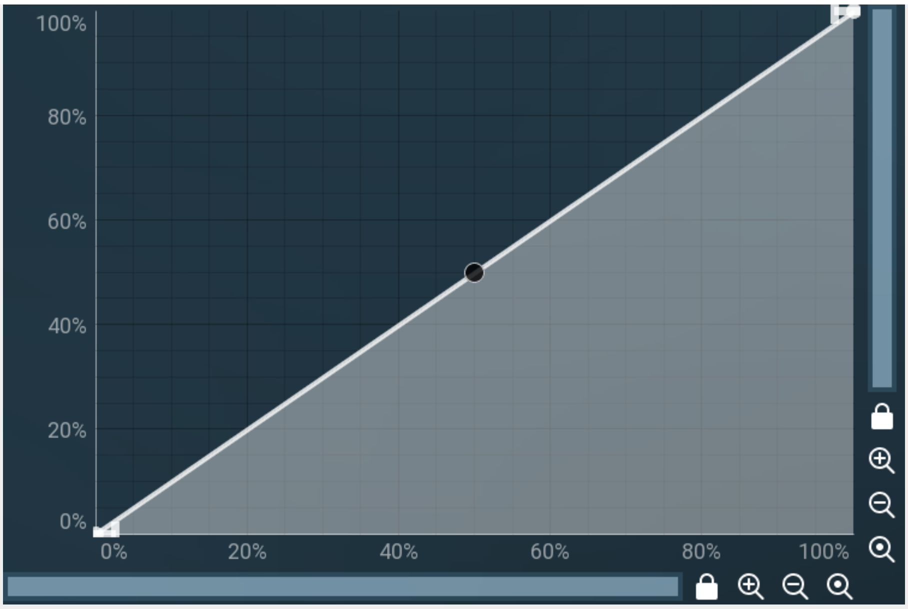
Randomize

Randomize button loads a random preset.



Enable

Enable button enables the level transformation module. It is off by default to save CPU resources.

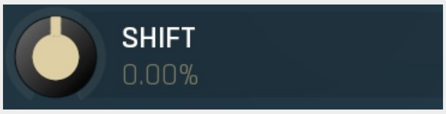


EnvelopeEditorGraph

Envelope graph

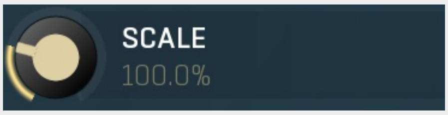
Envelope graph provides an extremely advanced way to edit any kind of shape that you can imagine. An envelope has a potentially unlimited number of points, connected by several types of curves with adjustable curvature (drag the dot in the middle of each arc) and the surroundings of each point can also be automatically smoothed using the smoothness (horizontal pull rod) control. You can also literally draw the shape in drawing mode (available via the main context menu).

- **Left mouse button** can be used to select points. If there is a *point*, you can move it (or the entire selection) by dragging it. If there is a *curvature circle*, you can set up its tension by dragging it. If there is a *line*, you can drag both edge points of it. If there is a *smoothing controller*, you can drag its size. Hold **Shift** to drag more precisely. Hold **Ctrl** to create a new point and to remove any points above or below.
- **Left mouse button double click** can be used to create a new point. If there is a *point*, it will be removed instead. If there is a *curvature circle*, zero tension will be set. If there is a *smoothing controller*, zero size will be set.
- **Right mouse button** shows a context menu relevant to the object under the cursor or to the entire selection. Hold **Ctrl** to create or remove any points above or below.
- **Middle mouse button** drag creates a new point and removes any points above or below. It is the same as holding Ctrl and dragging using left mouse button.
- **Mouse wheel** over a point modifies its smoothing controller. If no point is selected, then all points are modified.
- **Ctrl+A** selects all points. **Delete** deletes all selected points.



Shift

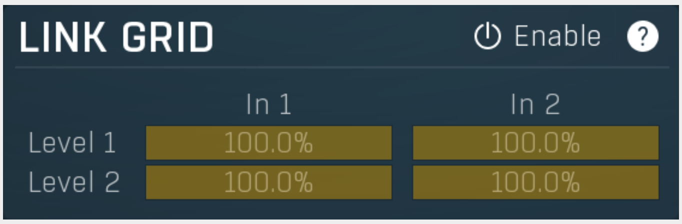
Shift lets you virtually shift the whole graph vertically. This basically shifts the dynamic gain.



Scale

Scale lets you virtually scale the whole graph vertically. This basically scales the dynamic gain.

Link grid panel



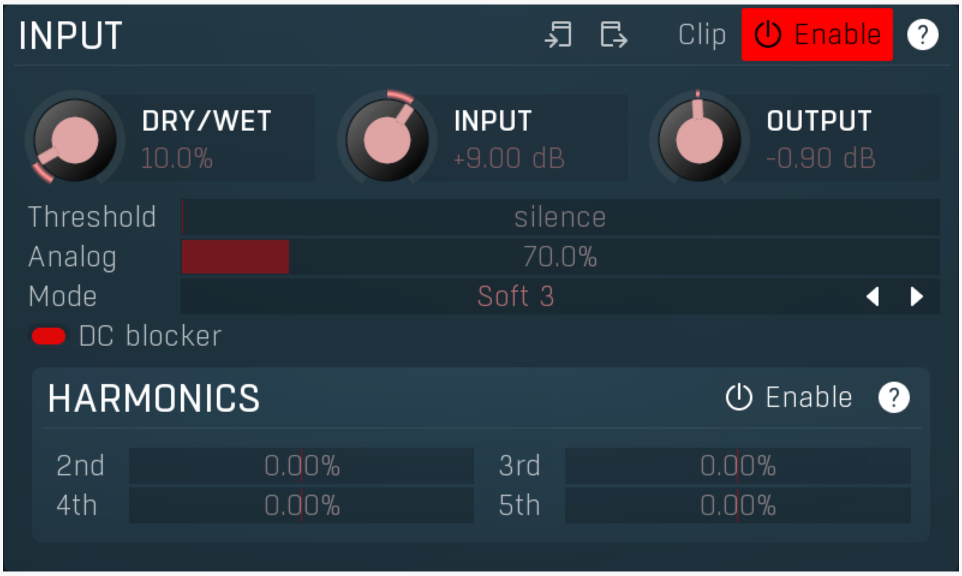
Link grid panel controls the linking between the channels; that is. how the input level in each channel affects the levels in the other channels. By default the way channels affect processing in other channels depends solely on the **Link channels** parameter.

Here you can set up a more complicated relationship. For example, you can make the left channel (1) respond to the right channel (2) only and vice versa. Each column in the grid is an input and each row is an output. Each output level is a mix of the factored input levels. For that example above, the values for "Level 1" would be 0% and 100%, and for "Level 2" they would be 100% and 0%.

Enable

Enable button enables the link-grid module. It is off by default to save CPU resources.

Saturator panel



Saturator panel contains parameters of the saturator.

Copy

Copy button copies the settings onto the system clipboard.

Paste

Paste button loads the settings from the system clipboard.

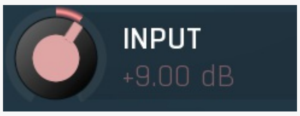
Enable clipping

Enable clipping activates the clipper performed after the saturation and the harmonics generator.

Dry/Wet

Dry/Wet defines ratio between dry and wet signals. 100% means fully processed, 0% means no processing at all.

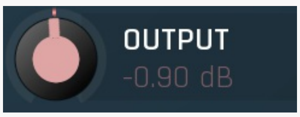
Range: 0.00% to 100.0%, default 20.0%



Input

Input defines the input gain.

Range: -40.00 dB to +40.00 dB, default 0.00 dB



Output

Output defines the gain applied to the output. It is processed after the clipper, if enabled, hence the output saturator's output gain serves as ceiling if you are creating a limiter.

Range: -40.00 dB to +40.00 dB, default 0.00 dB

Threshold

Threshold determines the minimal signal level above which the effect starts to apply. By lowering the threshold you increase loudness and also distortion being the effect of saturation.

Range: silence to 0.00 dB, default silence

Analog

Analog determines the amount of even harmonics added to the signal in addition to the main saturation. The amount of the harmonics is dependent on the saturation signal, unlike the full harmonic control in the **Harmonics** panel, which is completely independent of the actual saturation processing.

Range: 0.00% to 500.0%, default 10.0%

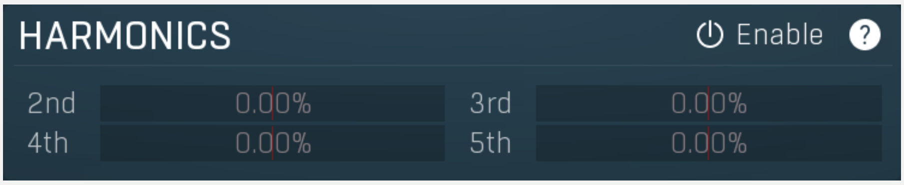
Mode

Mode defines saturation shape and its' character. In disabled mode the whole saturation unit is disabled leaving only the harmonics processor.

DC blocker

DC blocker activates the integrated DC blocker that should remove any signal offset, which can especially be caused by the harmonic generators.

Harmonics panel



Harmonics panel provides a generator of additional harmonics. This processing is applied after the saturation. It is well-known phenomenon, that transistors and digital shaping devices generate only odd harmonics (3rd, 5th), while tubes, tapes and other nonlinear analog devices create even harmonics (2nd, 4th) too.

2nd

2nd controls the amount of 2nd harmonic typical for tubes.

Range: -100.0% to 100.0%, default 0.00%

3rd

3rd controls the amount of 3rd harmonic typical for transistors.

Range: -100.0% to 100.0%, default 0.00%

4th

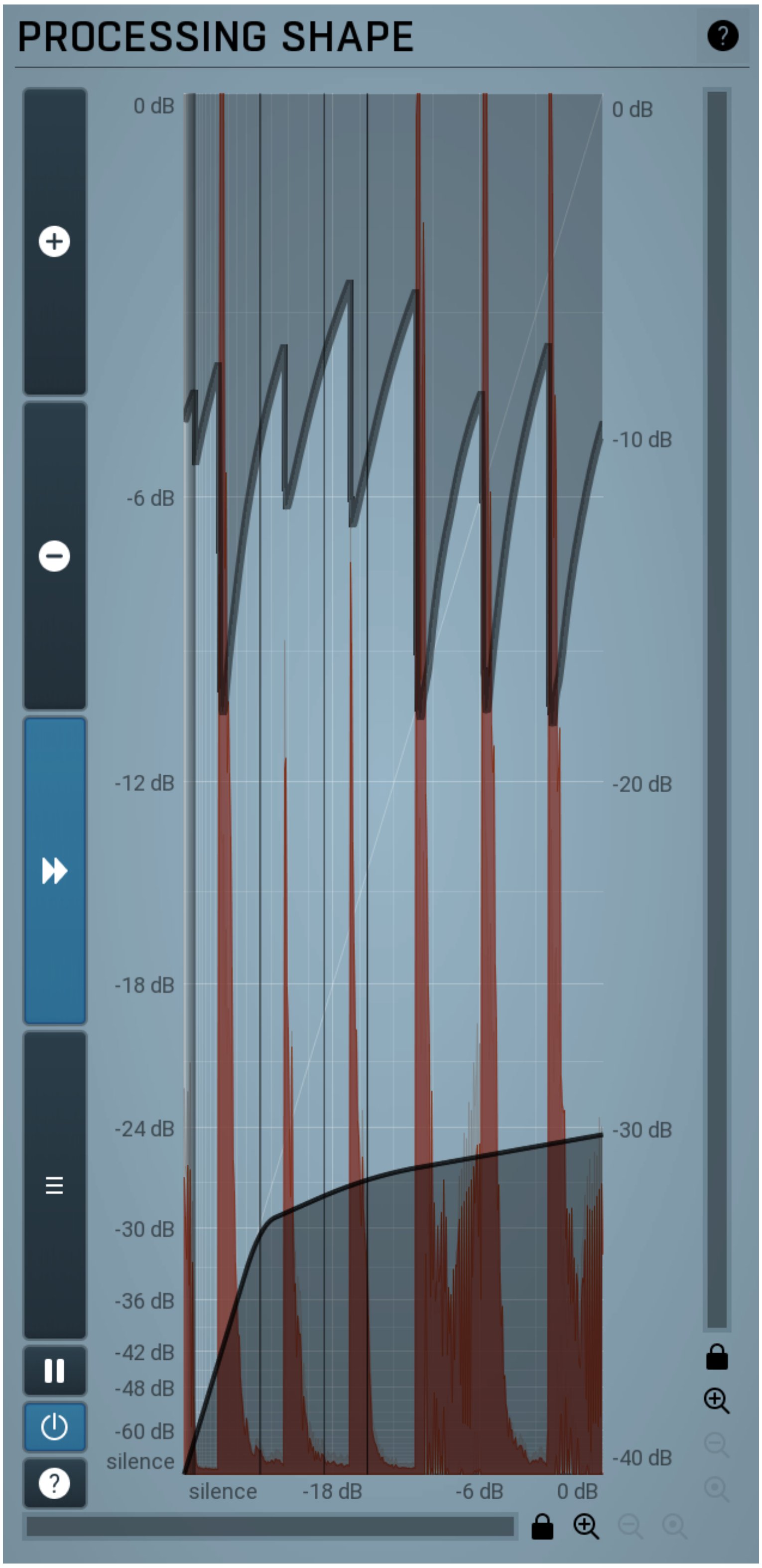
4th controls the amount of 4th harmonic typical for tubes.

Range: -100.0% to 100.0%, default 0.00%

5th

5th controls the amount of 5th harmonic typical for transistors.

Range: -100.0% to 100.0%, default 0.00%



Level shape graph

Level shape graph displays the dynamic processing transformation shape. The X axis represents the input signal level, Y axis defines the output level.

Please note that this display is not logarithmic. This can lead to confusion, as, for example, a moving expander's threshold changes the graph's slope while the ratio stays the same. This is however necessary, because a logarithmic display can never contain silence, as it is minus infinity decibels, and the silence point is essential for gates for example. The display is therefore a compromise between usability and accuracy.

The moving vertical line shows the current detected level. It may be moving extremely quickly depending on the settings. It may also be invisible if the input level is silence or above 0dB (which is not recommended unless you are using the processor as a limiter). There may be other graphs available, such as input & output waveform and gain reduction time graphs.

Plus
Plus button increases the time-graph speed (reduces the period that is displayed).

Minus
Minus button decreases the time-graph speed (increases the period that is displayed).

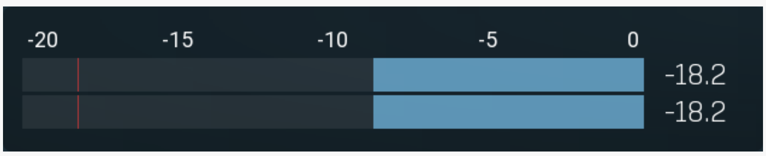
Rewind
Rewind button enables or disables the time-graph static mode. In static mode the graphs are fixed and the current position cycles from left to right; otherwise the graphs move from right to left and the current position is fixed (at the right-hand side).

Menu
Menu button displays the time-graph settings. In this window you can control which graphs are displayed, the speed and other relevant parameters.

Pause
Pause button pauses the processing.

Enable
Enable button enables or disables the metering system. You can disable it to save system resources.

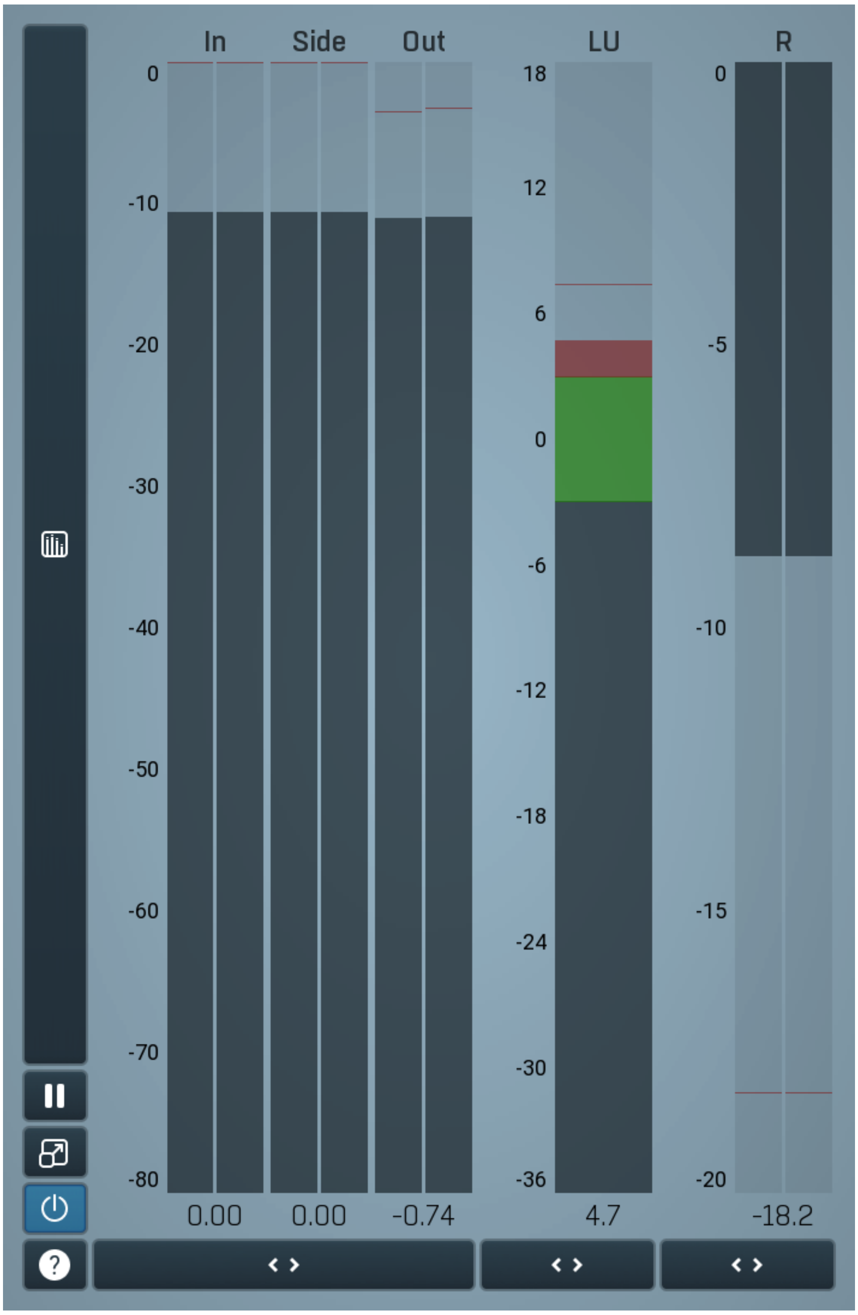
Meters



Meters display gain-reduction for each channel being processed. Also it contains controls to manipulate time-graphs shown in the transformation shape graph above.

Collapse

Collapse button minimizes or enlarges the panel to release space for other editors.



Global meter view

Global meter view provides a powerful metering system. If you do not see it in the plug-in, click the **Meters** or **Meters & Utilities** button to the right of the main controls. The display can work as either a classical level indicator or, in time graph mode, show one or more values in time. Use the first button to the left of the display to switch between the 2 modes and to control additional settings, including pause, disable and pop up the display into a floating window. The meter always shows the actual channels being processed, thus in M/S mode, it shows mid and side channels.
In the classical level indicators mode each of the meters also shows the recent maximum value. Click on any one of these values boxes to reset them all.

In meter indicates the total input level. The input meter shows the audio level before any specific processing (except potential oversampling and other pre-processing). It is always recommended to keep the input level under 0dB. You may need to adjust the previous processing plugins, track levels or gain stages to ensure that it is achieved.

As the levels approach 0dB, that part of the meters is displayed with **red** bars. And recent peak levels are indicated by single bars.

Out meter indicates the total output level. The output meter is the last item in the processing chain (except potential downsampling and other post-processing). It is always recommended to keep the output under 0dB.

As the levels approach 0dB, that part of the meters is displayed with **red** bars. And recent peak levels are indicated by single bars.

R meter shows gain reduction for each channel. Negative values, running down from the top, mean that compression or limiting is occurring. The lower the value, the stronger the effect. For maximum transparency you should try to achieve the least amount of gain reduction. Expansion is not indicated in this meter.

LU meter shows the output loudness in EBU-18 scale. The loudness metering follows the ITU-R BS.1770-3 and EBU 3341 specifications. The metering units used are LU (Loudness Units) with 0 LU defined as -23 LUFS (LU Full Scale) and you should consider the LU values to be relative - using them to compare the loudness values between different signals. If the difference in loudness between 2 signals is 10 LU, it is approximately 10 dB as well.

Please note that you should still use your ears to judge loudness properly as there is still no accurate model of human loudness perception and every measurement is only an approximation. Loudness perception is also individual.

If you right click on the meter, additional settings will be displayed. Maximum value displays the maximum since the analysis started, rather than the recent maximum. Loudness pre-filtering uses EBU standard filters to simulate human perception. However, you may want to disable this to get more technical measurements.

There are 3 types of loudness measurements, all following the EBU specifications.
Momentary loudness uses an RMS sliding analysis window of 400 milliseconds; therefore it shows quick fluctuations in loudness.
Short-term loudness works in the same way, but uses a window of 3 seconds, therefore it provides more stable loudness measurements.
Integrated loudness shows the overall loudness, hence it is affected by the whole track from the beginning of the playback until you reset it by clicking on the value field. The host may reset it too; it depends on your host.

Please note that the **Integrated loudness** is NOT the same as an averaged loudness, as it ignores quiet passages. Imagine a track which is generally quiet but has a few loud sections. The averaged loudness will be less than the Integrated loudness. Its calculation uses gating to ignore those quiet passages (levels less than 10 LU less than the current ungated level) of the track. Essentially, **Integrated loudness** is a measure of the loudest sections of the track.

Time graph

Time graph button switches between the metering view and the time-graphs. The metering view provides an immediate view of the current values including a text representation. The time-graphs provide the same information over a period of time. Since different time-graphs often need different units, only the most important units are provided.

Pause

Pause button pauses the processing.

Popup

Popup button shows a pop-up window and moves the whole metering / time-graph system into it. This is especially useful in cases where you cannot enlarge the meters within the main window or such a task is too complicated. The pop-up window can be arbitrarily resized. In metering mode it is useful for easier reading from a distance for example. In time-graph mode it is useful for getting higher accuracy and a longer time perspective.

Enable

Enable button enables or disables the metering system. You can disable it to save system resources.

Collapse

Collapse button minimizes or enlarges the panel to release space for other editors.

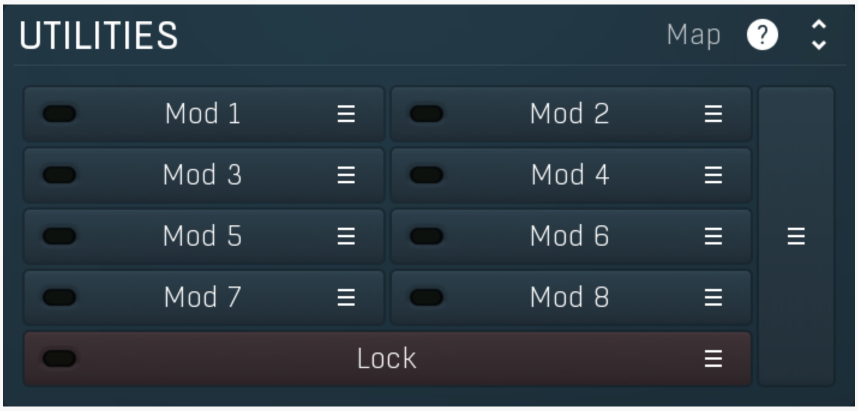
Collapse

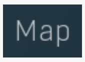
Collapse button minimizes or enlarges the panel to release space for other editors.

Collapse

Collapse button minimizes or enlarges the panel to release space for other editors.

Utilities





Map

Map button displays all current mappings of modulators, multiparameters and MIDI (whichever subsystems the plugin provides).

Modulator

Modulator button displays settings of the modulator. It also contains a checkbox, to the left, which you can use to enable or disable the modulator. Click on it using your right mouse button or use the **menu button** to display an additional menu with learning capabilities - as described below.

Menu

Menu button shows the **smart learn** menu. You can also use the right mouse button anywhere on the modulator button.

Learn activates the learning mode and displays "REC" on the button as a reminder, **Clear & Learn** deletes all parameters currently associated with the modulator, then activates the learning mode as above. After that every parameter you touch will be associated to the modulator along with the range that the parameter was changed. Learning mode is ended by clicking the button again.

In smart learn mode the modulator does not operate but rather records your actions. You can still adjust every automatable parameter and use it normally. When you change a parameter, the plugin associates that parameter with the modulator and also records the range of values that you set.

For example, to associate a frequency slider and make a modulator control it from 100Hz to 1KHz, just enable the smart learn mode, click the slider then move it from 100Hz to 1KHz (you can also edit the range later in the modulator window too). Then disable the learning mode by clicking on the button.

Menu

Menu button displays additional menu containing features for modulator presets and randomization.

Lock

Lock button displays the settings of the global parameter lock. Click on it using your left mouse button to open the Global Parameter Lock window, listing all those parameters that are currently able to be locked.
Click on it using your right mouse button or use the **menu button** to display the menu with learning capabilities - **Learn** activates the learning mode, **Clear & Learn** deletes all currently-lockable parameters and then activates the learning mode. After that, every parameter you touch will be added to the lock. Learning mode is ended by clicking the button again.
The On/Off button built into the Lock button enables or disables the active locks.

Collapse

Collapse button minimizes or enlarges the panel to release space for other editors.

Multiparameter

Multiparameter button displays settings of the multiparameter. The multiparameter value can be adjusted by dragging it or by pressing Shift and clicking it to enter a new value from the virtual keyboard or from your computer keyboard.

Click on the button using your left mouse button to open the **Multiparameter** window where all the details of the multiparameter can be set. Click on it using your right mouse button or click on the **menu button** to the right to display an additional menu with learning capabilities - as described below.

Menu

Menu button shows the **smart learn** menu. You can also use the right mouse button anywhere on the multiparameter button.

Learn attaches any parameters, including ranges. Click this, then move any parameters through the ranges that you want and click the multiparameter button again to finish. While learning is active, "REC" is displayed on the multiparameter button and learning mode is ended by clicking the button again.

Clear & Learn clears any parameters currently in the list then attaches any parameters, including ranges. Click this, then move any parameters through the ranges that you want and click the multiparameter button again to finish. While learning is active, "REC" is displayed on the multiparameter button and learning mode is ended by clicking the button again.

Reset resets all multiparameter settings to defaults.

Quick Learn clears any parameters currently in the list, attaches one parameter, including its range and assigns its name to the multiparameter. Click this, then move one parameter through the range that you want.

Attach MIDI Controller opens the MIDI Settings window, selects a unused parameter and activates MIDI learn. Click this then move the MIDI controller that you want to assign.

Reorder to ... lets you change the order of the multiparameters. This can be useful when creating active-presets. Please note that this feature can cause problems when one multiparameter controls other multiparameters, as these associations will not be preserved and they will need to be rebuilt.

In learning mode the multiparameter does not operate but rather records your actions. You can still adjust every automatable parameter and use it normally. When you change a parameter, the plugin associates that parameter with the multiparameter and also records the range of values that you set.

For example, to associate a frequency slider and make a multiparameter control it from 100Hz to 1KHz, just enable the smart learn mode, click the slider then move it from 100Hz to 1KHz (you can also edit the range later in the Multiparameter window too). Then disable the learning mode by clicking on the button.

Collapse

Collapse button minimizes or enlarges the panel to release space for other editors.