Devastor is a multiband stereophonic distortion effect unit. It has two independent signal processing paths (for each channel: L,R).

After loading the plug-in within a host application, the GUI will appear:

Devastor graphical interface

There are two sections:

- **Configuration and preset management**
  
  Configuration and preset selection section

- **Signal processing control section** consists of the all remaining controls
Signal flow

This chapter describes the signal path through Devastor. It also explains the basic components of the effect unit and their control parameters.

Basic modules

Internally, Devastor consists of a few basic components. These correspond to the sections on the graphical interface.

Dynamic’s flattener

Depending on the value of Dynamics knob, this module will equalize levels in the signal’s amplitude. Its principle of working is similar to a compressor’s operation with auto normalization of the amplitude. However, its control (using one knob) is much simpler than that.

Diode clipper

This is the central and the most important element of Devastor. It simulates the behavior of a diode clipper analogue circuit. The signal
distortion is caused by the circuit “clipping” the top and bottom from the audio waveform.

Control of this module is performed by following controls:

- **Preamp** – Amplification of signal in Diode clipper.
- **Threshold** – This is the nominal level of amplitude, above this the distortion of the signal occurs.
- **Shape** – Depending on a chosen Clipping curve, this parameter changes its characteristics.
- **Clip** – Clicking the display that shows Clipper's curve, we can switch between 6 available different curves:

```
1. \[ \text{Out} \]
2. \[ \text{Out} \]
3. \[ \text{Out} \]
4. \[ \text{Out} \]
5. \[ \text{Out} \]
6. \[ \text{Out} \]
```

Devastor Clipper's curves
SIGNAL FLOW • BASIC MODULES

- **Tanh** - Hyperbolic tangent (Tanh)
- **Atan** - Arcus tangent
- **Hardclip** - Linear hard clip
- **Crossover**
- **Asim. Tanh** - Asymmetric hyperbolic tangent
- **Mixed Tanh / Clip** - Mixed Tanh and Linear hard clip

Two LEDs; **Clip +/−** indicate exceeding the threshold value by **positive** and/or **negative** halves of signal. This module works asymmetrically relative to zero.

**Filter**

In Devastor, we have three filter units at our disposal. They are independently configurable and are able to work in different configurations (they are connected in parallel, before or after the **Clipper** circuit – see figure below)

![Filter controls](image)

*Filters’ section*

For each filter, the following parameters can be controlled:
• **Cutoff** - Filter’s cut-off frequency
• **Reso/B.Width** - Filter’s resonance or in a case of band-pass or band-reject filters, it’s width.
• **Volume** - Volume of output signal (from the filter).
• **Filter type** - Filter type; **LP** – low-pass, **BP** – band-pass, **HP** – hi-pass, **BR** – band-reject, **Off** – filter off.

Above parameters apply to all filters. Filters can only be connected in parallel, serial or mixed.

**Possible filters’ and clipper’s configurations**

Clicking the **Signal Routing** control allows reconfiguring the circuit connections between filters as well as the **Clipper** module.

![Filters' and clipper's signal routing](image)
There are 9 various topologies to choose from:

<table>
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<th>GUI symbol</th>
<th>Name</th>
<th>Description</th>
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<tr>
<td><img src="image" alt="All Pre" /></td>
<td>All Pre</td>
<td>The signal is parallely processed by all 3 plugin’s Filters. Their sum then is fed onto to the Clipper block.</td>
</tr>
<tr>
<td><img src="image" alt="1 Pre / 2 Post" /></td>
<td>1 Pre / 2 Post</td>
<td>Signal is processed by Filter 1 before it gets to the Clipper. Distorted signal then is processed by Filter 2 and Filter 3 simultaneously, the output of which is summed.</td>
</tr>
<tr>
<td><img src="image" alt="2 Pre / 1 Post" /></td>
<td>2 Pre / 1 Post</td>
<td>Signal processed simultaneously by Filter 1 and 2, then the sum of their outputs is routed to Clipper. Its output is then processed by Filter 3.</td>
</tr>
</tbody>
</table>
All Post

The signal routed through Clipper is being processed by all the 3 Filters parallelly.

1 Side / 2 Pre

Signal is processed by each of the 3 Filters parallelly. After that the sum of the Filter 2 and Filter 3 outputs is routed to Clipper and eventually summed with Filter’s 1 output.

1 Side / 2 Post

Signal processed by Filter 1 and Clipper simultaneously. The Clipper’s output then is equally fed onto Filter 2 and 3 inputs. Finally all 3 Filters’ outputs are summed.
Side / Pre / Post

Input signal is distributed to Filters no 1 and no 2. Filter 2 is then routed to the Clipper, which output then gets to the Filter 3. Filter no 1 and no 3 are eventually mixed together.

2 Side / 1 Pre

Signal is input to every Filter equally. Filter 2 routed to Clipper, is eventually mixed with Filter 1 and 3 outputs.

2 Side / 1 Post

Signal is parallelly input to Filter 1, 2 and Clipper. Clipper's output then is routed to Filter 3, the output of which is then mixed with Filter's 1 and 2 outputs.
Master section

- Amplitude of the output signal is adjusted by the **Output** volume knob.
- The **Output meter** shows the current amplitude of the output signal after the adjustment.
- **FX** knob controls proportions between processed and non-processed sound outgoing from Devastor.
- The Devastor’s master output can optionally be secured with limiter (optionally enabled by **Limiter** toggle button). It is applied to the mixed **Wet** and **Dry** signals.
Path of the signal’s flow

The input signal goes to the Flattener, then, depending on setting of the Signal Routing section, it is sent to the group of Filters and the Diode Clipper. Then, the amplitude of output signal is modified by the Output volume knob and optional Limiter. And finally the output mixed with dry signal accordingly with the value of FX value.
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