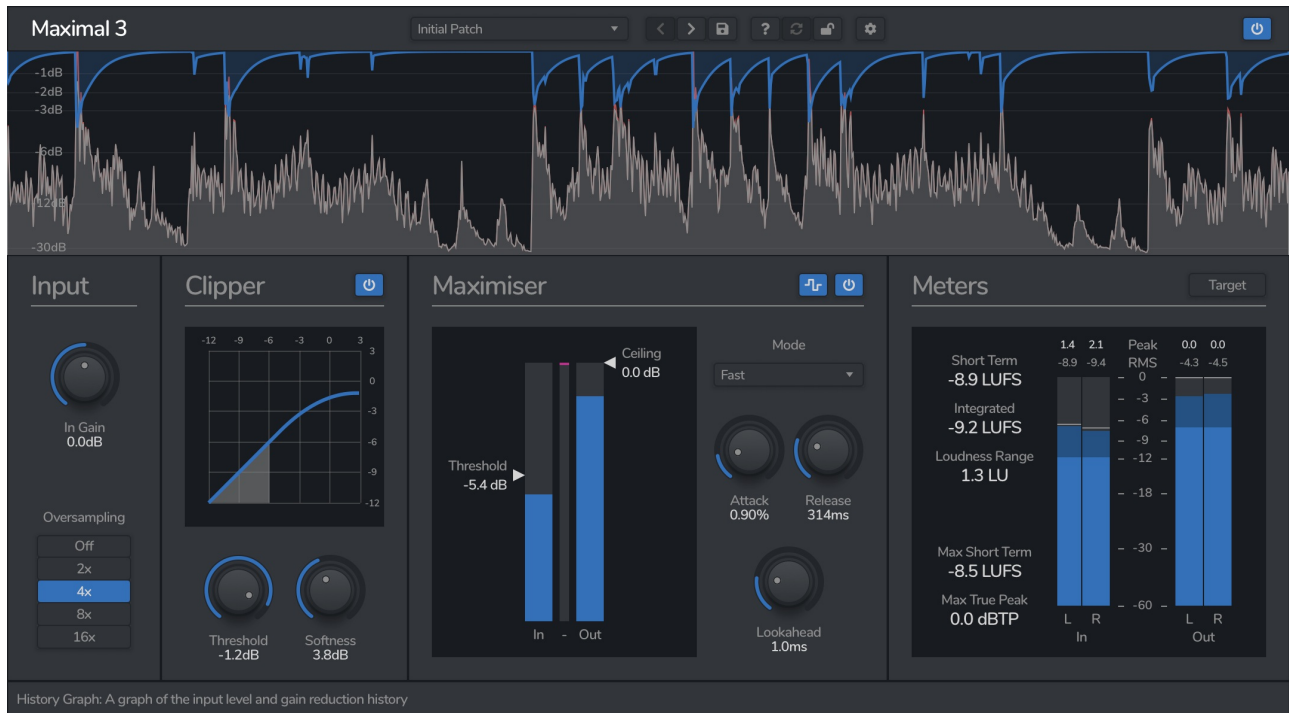


# Maximal 3

v3.1.0



Maximal 3 is a loudness maximiser offering true-peak brickwall limiting, variable shape soft-clipping, and substantial loudness metering options, perfect for mixing and mastering.

## Installing Maximal 3

To install Maximal 3 on **Mac** or **Windows**, simply run the installer and follow the instructions. Once installed, Maximal 3 will be ready to use the next time you open your DAW.

To install the plugin on **Linux**, simply extract the files and run the install.sh script. In your Terminal app, run the following commands:

```
cd ~/Downloads Change to your Downloads folder
mkdir tempinstaller Create a temporary folder to extract to
tar -C tempinstaller -zxvf PLUGIN.tar.gz Extract the bundle
bash tempinstaller/install.sh Run the installer script
rm -R tempinstaller/ Clean up the temp folder
```

Maximal 3 requires the following system specifications:

### Windows

- Windows 10+
- 64-bit VST/VST3/AAX
- Compatible DAW

### Mac OSX

- MacOS 10.13+
- 64-bit VST/VST3/AAX/AU
- Compatible DAW
- Intel or M1 Processor

### Ubuntu

- Ubuntu 22.04+
- 64-bit VST/VST3
- Compatible DAW

## Registering Maximal 3

The plugin will run in demo mode until a licence is entered and the software is restarted. In demo mode the plugin will not recall the state from a saved track, it will timeout after 30 minutes, and the saving of presets is unavailable. After you have purchased a licence, you will need to register the plugin, which will unlock the full, unrestricted version of the software. Any tracks you have saved with the demo version will now recall correctly.

Click the padlock icon in the top bar area of the plugin window. A window will display where you can enter your licence from the Venomode website user area. After you have entered your licence, the full version will unlock the next time you open your DAW.

From the Venomode website, you can either copy the licence to your clipboard and paste it in the plugin, or download a keyfile and open in the plugin to register.

# Using Maximal 3

## 1. Input

The input section lets you apply input gain and oversampling to the signal before processing.

The **In Gain** slider applies an increase or decrease gain to the input before any processing.

### Oversampling

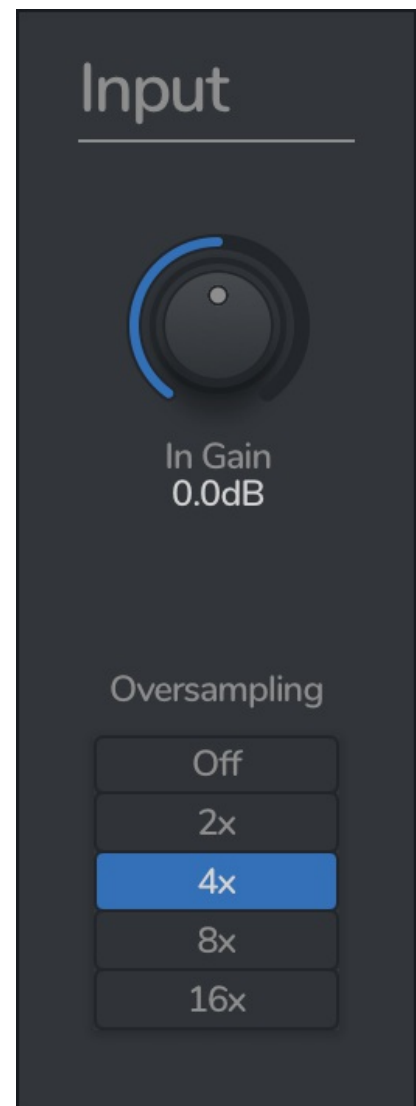
Non-linear processes such as clipping and limiting, especially when pushed hard, can introduce aliasing - the distortion caused when content is generated at a higher frequency than half of the sample-rate. Aliasing both degrades the sound quality, and introduces inter-sample peaks.

Faster limiting, and harder clipping increases aliasing, so we often use oversampling which lets us run internal processing at a higher sample rate - when we resample back down, there should be less of these artefacts as they will have been filtered out.

The **Oversampling** buttons allow the signal to be upsampled up to 16 times. The oversampling algorithm uses high-quality, linear phase filters for clean re-sampling. Linear phase filters can introduce a slight pre-ring, however it's generally only a tiny amount and can't usually be noticed. Oversampling also increases CPU usage the higher you go.

As Maximal 3's limiter is true-peak, the signal will never go above the **Ceiling** value you set - if you don't oversample, then the limiter has to work harder to catch the inter-sample peaks, reducing the overall loudness and efficiency of the limiter.

In most cases, 4x oversampling should be sufficient to reduce aliasing and manage inter-sample peaks without overloading your CPU.

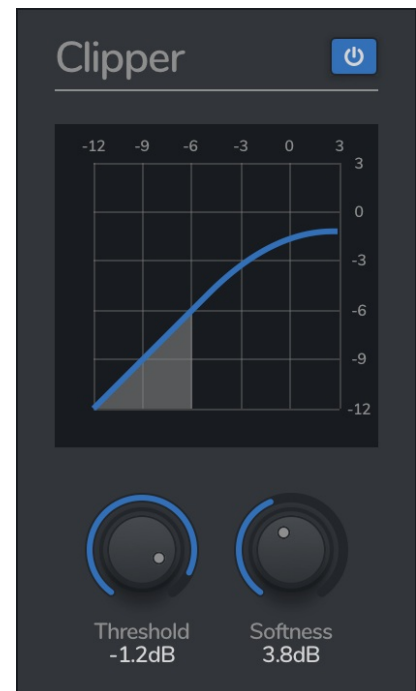


## 2. Clipper

Although clipping is usually avoided in the audio world, it's actually a secret tool to transparently increase loudness, while also adding subtle warmth to the sound.

Clipping basically stops any signal from exceeding a certain value, but unlike a limiter which does this in a smooth and controlled manner by reducing the level over time, clipping simply cuts off the signal at the threshold.

For example, if your snare drum peaks at 0dB and you set your clipper to -3dB, any signal above -3db will be clipped. You now have peaks that are 3dB lower, giving you more headroom for the other elements in your mix. Alternatively, you could increase your signal by 3dB, resulting in the peak level being 0dB, but with a 3dB louder signal overall.



The clipper also has an advantage when it comes before limiting - if you use it to shave of the highest peaks in the audio, the limiter doesn't have to work as hard.

As clipping is a type of distortion, additional harmonics and aliasing are introduced into the signal. Hard clipping adds more overtones to the signal, and results in the clipping sound we're all familiar with when we've accidentally cranked the gain on something. Soft clipping however, reduces the harshness of the distortion, resulting in a more subtle, possibly warmer, sound.

Full-spectrum signals such as snare drums and whole tracks can mask the effects of a clipper as the extra frequencies generated are hidden among the existing high frequency content. With a subtle amount of clipping, the end result is a signal with less dynamic range and fewer peaks, which can be a pretty transparent alternative to a limiter.

Maximal 3 features a clipper with a variable curve, allowing for everything from hard clipping to soft saturation.

The button at the top right enables the clipper, and when active, the graph and knobs are enabled.

The **Threshold** knob sets the level at which clipping occurs. For example, at -3dB, the signal will never exceed -3dB.

The **Softness** knob applies a gentler curve to the clipping algorithm. As you increase softness, the sharpness of the transition at the threshold is reduced. The value is how many decibels around the threshold is softened.

Above the controls is a graph displaying the clipper curve and the current input level. The horizontal axis shows the input level in decibels, and the vertical axis shows the output level in decibels. The coloured line shows the relation between input and output. The filled grey section shows the input level as the audio is playing.

### 3. Maximiser

At the heart of Maximal 3 is the Maximiser - a true-peak brickwall limiter.

A limiter works by automatically adjusting the output gain to make sure that the signal never exceeds the **Threshold**. The Maximiser then applies a gain boost so that the maximum level is the **Ceiling**. For example, with a threshold of -3dB, and a ceiling of 0dB, the input will be limited so that no signal reaches above -3dB, and then a boost of 3dB is applied so the peak value reaches 0dB. This increases the overall level by 3dB.



You can hold the CTRL/CMD key to link the two sliders, so that adjusting the level of one affects the other by the same amount. This lets you use the maximiser as limiter, adjusting the threshold without affecting the overall level.

The **Lookahead** slider sets how far ahead in time the maximiser should look when calculating gain reduction. If there is no lookahead, then the limiter will react immediately to transients. This can cause distortion as the limiter almost acts like a clipper in this early stage. Increasing the lookahead allows the limiter some time to ramp to the desired gain reduction value.

Longer lookahead times will reduce the chances of aliasing and distortion, but the result may not be as loud, and transients may get smeared into the background a little. This is dependant on the other settings of the maximiser, but a small amount of lookahead generally has the best results.

Maximal 3 features four different modes, which affect the envelope of the gain reduction:

- **Fast** - Super fast limiting. Great for keeping the punch in very transient material, and achieving maximum loudness, although distortion may occur if pushed too hard.
- **Clear** - A slightly less aggressive version of the "Fast" mode. A great all-rounder algorithm.
- **Soft** - A more noticeable algorithm, softening transients and giving a more compressed sound. Can be used to glue together a bus or mix.
- **Pump** - A purposefully shaped envelope with more chance of resulting in a pumping sound.

## **Attack and Release**

The **Attack** and **Release** knobs affect how the gain reduction is applied over time, and define the overall shape and response of the limiter.

You can think of Maximal's limiter as having two stages - a fast stage, followed by a slow stage. The fast stage is always active, and catches the peaks and transients. The slower release stage is affected by the attack and release knobs, and smooths out the gain reduction.

The release parameter is the time it takes for the gain reduction to return to zero after the signal has dropped back below the threshold. It is labelled in milliseconds, however this is only a guide - the different modes will affect the overall release time.

The attack parameter controls how long it takes for the 'release' stage to set in. When the attack is set to zero, the release stage starts straight away. When the attack is increased, it takes a little while for the release stage to kick in.

With a zero or very short attack there is less chance of distortion, however the limiting is more noticeable as the release stage holds onto the gain reduction after the initial transient. With a longer attack, the sound will be louder and clearer, but with more chance of distortion.

## 4. Meters

The metering section shows information about the overall loudness of your track. If you're targeting a broadcast standard such as EBU R128, you'll find this section invaluable to making your mixes the correct level, but for general music production, these are really only for reference.

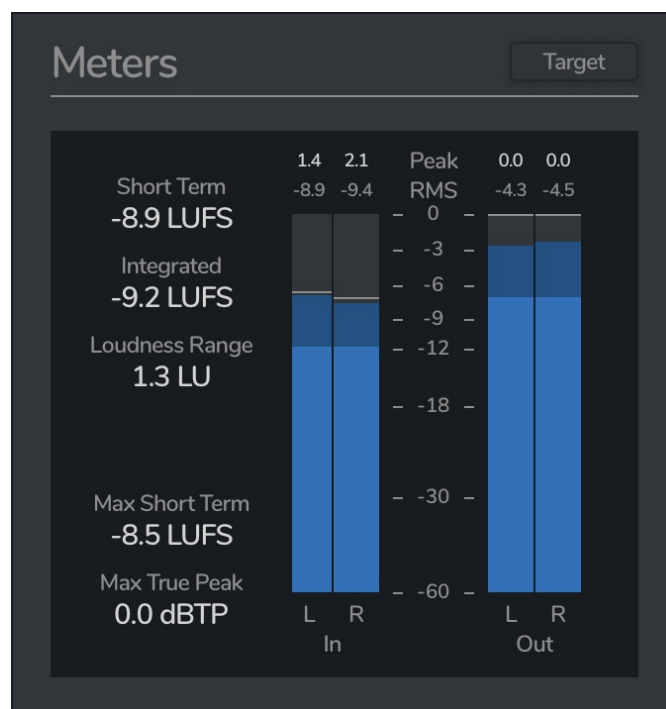
**nb. If you've read that you need to target -14LUFS for Spotify, it's not true... don't target LUFS values unless you need to!**

You can see various LUFS values (short term, integrated, and maximum short term), the loudness range, and true peak values. There are also peak and RMS level meters, with the lighter bar showing RMS, the darker bar showing peak, and the line showing a peak hold. Above the meters are the maximum peak and RMS values. Clicking any of the values will reset all the meters.

If you click the **Target** button, you can toggle the view into target mode. Here you can view the realtime loudness levels on graphical meters, relative to your **Target**.

When you select your target LUFS value with the **Target** knob, the meters will show LU relative to the target. For example, if you are targeting -10LUFS, and your signal is -9LUFS, the meter will show 1LU (as it is 1 loudness unit above the target).

You can select different scales based on the EBU specification - EBU +9, EBU +18, and absolute.



## 5. Top Bar

The top bar is where you can manage the plugin. The middle section shows the currently selected preset, and if you open this list you can choose from all the factory and user presets. Clicking on the left and right arrow icons manually cycles to the previous or next preset. The save icon will open a window where you can save the current state of the plugin as a custom preset. Enter your preset name in this window and click save.

You can view this manual at any time by clicking the question mark button.

The padlock icon will open the registration window. Enter your licence code exactly as shown in your Venomode user area and click "Register". You can simply click the licence in your Venomode account to copy it to your clipboard. See the registering Maximal 3 section for more info.

The cog icon will open a settings window where you can alter the GPU acceleration settings, GUI scale and theme. The update icon is two arrows in a circle. This button will activate when a new version is available for download.

The top right icon with a power button symbol will enable or disable the plugin.

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