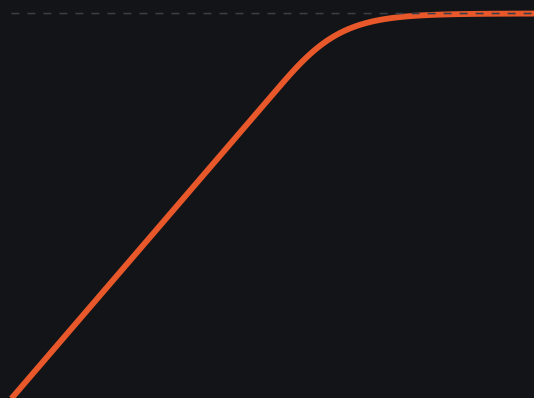




EMBER CLIP

User Manual · v1.5

Ember Clip - mastering and mix-bus clipper with multiband clipping
VST3 for FL Studio and other DAWs · Windows and macOS (VST3 / AU)



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1 Quick start

Install. Download Ember Clip from emberaudiolabs.com and unzip it. On Windows, copy **Ember Clip.vst3** into C:\Program Files\Common Files\VST3\. On macOS, copy **Ember Clip.vst3** into /Library/Audio/Plug-Ins/VST3 and **Ember Clip.component** into /Library/Audio/Plug-Ins/Components. Close your DAW first if an older version is installed. In FL Studio, run **Options > Manage plugins > Find installed plugins**.

The version is shown in each plug-in's header (v1.5) and matches the zip name and this manual.

Ember Clip in five minutes.

1. Put Ember Clip last on the master (or on a drum bus). Leave everything at default: 4x oversampling, Smooth mode, Guard on.
2. Play the loudest part of the song and raise **Input** until the **CLIP** meter shows about 1 to 3 dB on the hits.
3. Press **DELTA** for a moment to hear only what is being clipped off. Thin clicks are fine; if you hear the melody or a buzzy tone, back Input off. Press DELTA again to return.
4. Add **Density** (2 to 4 dB) for more perceived loudness without more clipping. Turn on **UNITY** to compare at equal level.
5. If the top end turns harsh when you push, add **Silk** (30 to 60 %).
6. Check **HOT SPOT** after a full play-through and set Input for that moment.

Trial and activation

Ember Clip runs as a **full 14-day trial** from the first time you open it. After the trial it goes silent for 2 seconds every 45 seconds until you activate it. Your settings and projects are never affected.

To activate: buy a licence at emberaudiolabs.com; your licence key arrives by email. Click the status light at the top of Ember Clip (it reads TRIAL: ... DAYS LEFT), paste the key and click **ACTIVATE**. Activation needs an internet connection once; after that Ember Clip works offline.

Two computers per licence. To move to a new computer, open the licence panel on the old one and click **DEACTIVATE THIS COMPUTER**, then activate on the new one. Reinstalling on the same computer does not use up an activation.

About once a month, when online, Ember Clip quietly confirms the licence with the server. If you are offline it keeps working. Activation sends only your licence key and an anonymous code identifying the computer.

Tip. Ember Clip works relative to its **Ceiling**. Curves in this manual are drawn with the ceiling at 0 dB, so behaviour is identical whether your ceiling is 0 dBFS or -1 dBFS.

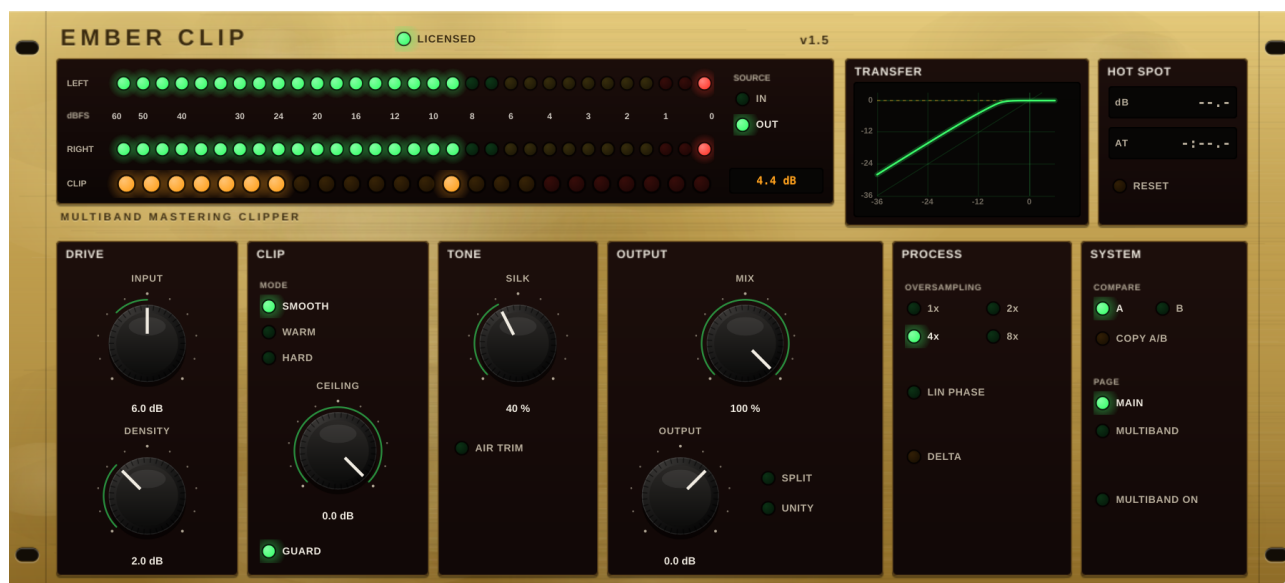
What's new in v1.5

- Ember Clip: 14-day trial, licence activation and the licence panel (see Trial and activation above).
- The plug-ins are now published by Ember Audio Labs.

Earlier, in v1.4

- Ember Clip has a new interface in the style of rack converter hardware: brushed-gold faceplate, LED-dot level meters (left and right, input or output), an LED clip row, and dark module panels with LED option buttons and black knobs.

Ember Clip

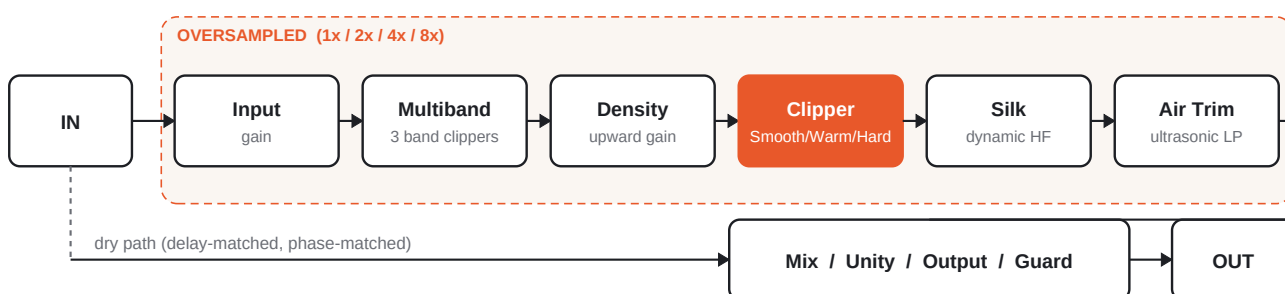


Ember Clip, main page.

The faceplate is laid out like a rack converter. Across the top: the **meter window** (LED level meters and the clip row), the **TRANSFER** screen and the **HOT SPOT** read-out. Below: the **DRIVE**, **CLIP**, **TONE**, **OUTPUT** and **PROCESS** modules, and the **SYSTEM** module, which stays in place on both pages. Click an LED or its label to switch an option on or off, or to choose between options (only one LED lights in a group such as MODE or OVERSAMPLING).

2 Signal flow

Everything inside the dashed box runs at the oversampled rate, which keeps distortion products from folding back as harsh aliasing. The dry signal is delayed by exactly the same amount as the processed signal (and, with Multiband on, passed through the same phase alignment), so blending them never causes comb filtering.



3 Main page controls

Control	Range	What it does
Input	-12 to +24 dB	Gain before everything else. The main way to set how hard you hit the clipper.
Density	0 to 6 dB	Upward, instantaneous loudness stage. Lifts quiet material, leaves peaks at the ceiling untouched. See section 4.
Ceiling	-24 to 0 dB	The clip point. All shaping happens relative to it.
Smooth / Warm / Hard	mode	Clipper character. See section 6.

Control	Range	What it does
Silk	0 to 100 %	Dynamic top-end softening that engages only as you push into the ceiling. See section 5.
Air Trim	on / off	2nd-order low-pass at 19.5 kHz (lower at 1x: 0.42 x sample rate) that removes ultrasonic clipping products.
Mix	0 to 100 %	Linear crossfade between processed (wet) and original (dry) signal.
Split	on / off	Replaces Mix with independent Dry and Wet level knobs (each -60 dB = off, up to +6 dB) for parallel clipping.
Unity	on / off	Removes the Density gain from the output so you can judge tone at equal loudness.
Output	-24 to +12 dB	Final level.
Guard	on / off	A final hard limit at the Ceiling after Output. With Guard on, no sample peak can exceed the ceiling, so raising Output above 0 dB clips into the Guard. Turn Guard off if you want Output to be pure gain.
Delta	on / off	Outputs only what the clippers removed (main and band clippers). Use it to set drive by ear.
Oversampling	1x, 2x, 4x, 8x	Processing rate multiplier. 4x is the default. See section 8.
Lin Phase	on / off	Linear-phase oversampling filters: no phase shift, more latency.
A / B / COPY A/B	SYSTEM module	Two complete settings slots: click A or B to switch. COPY A/B copies the active slot to the other one.
Hot Spot	read-out	Biggest clip (dB) and the song position (AT, minutes:seconds) where it happened. Only measured while the transport plays. RESET clears it.

Meters and screens. The **LEFT** and **RIGHT** LED rows show peak level from -60 to 0 dBFS (green, yellow from -6 dB, red from -1 dB) with a peak-hold LED; the scale between them is in dB below full scale. **SOURCE** switches them between the plug-in's **IN**put and **OUT**put (output by default). The **CLIP** row shows dB removed by the main clipper (0 to 12 dB, finer steps at the low end), and the read-out beside it holds the highest value for two seconds. The **TRANSFER** screen plots input level (x) against output level (y) for the current Input, Density, Ceiling and mode, with the ceiling dashed and a live dot for the incoming peak; with Delta on it shows the removed signal instead.

4 Density in depth

Density is an **upward** loudness stage. It works on every sample individually, with no attack or release, so it cannot pump or breathe. The quieter a sample is, the more gain it receives; samples at the ceiling receive none. The result is more body and sustain (perceived loudness) without changing the peak level that hits the clipper.

How the knob is mapped

The knob value **D** (0 to 6 dB, linear) is the gain applied to very quiet material. Internally $a = 10^{D/20} - 1$, and each sample, normalised so the ceiling is 1.0 ($u = |x| / \text{ceiling}$), is shaped by

$$y = (1 + a) \cdot u / (1 + a \cdot u^{1.5})$$

At low levels this is a gain of **D** dB; at the ceiling it is exactly 0 dB. The curve is monotonic, so it never folds back or reverses polarity. Anything above the ceiling continues with the curve's slope and is then caught by the clipper.

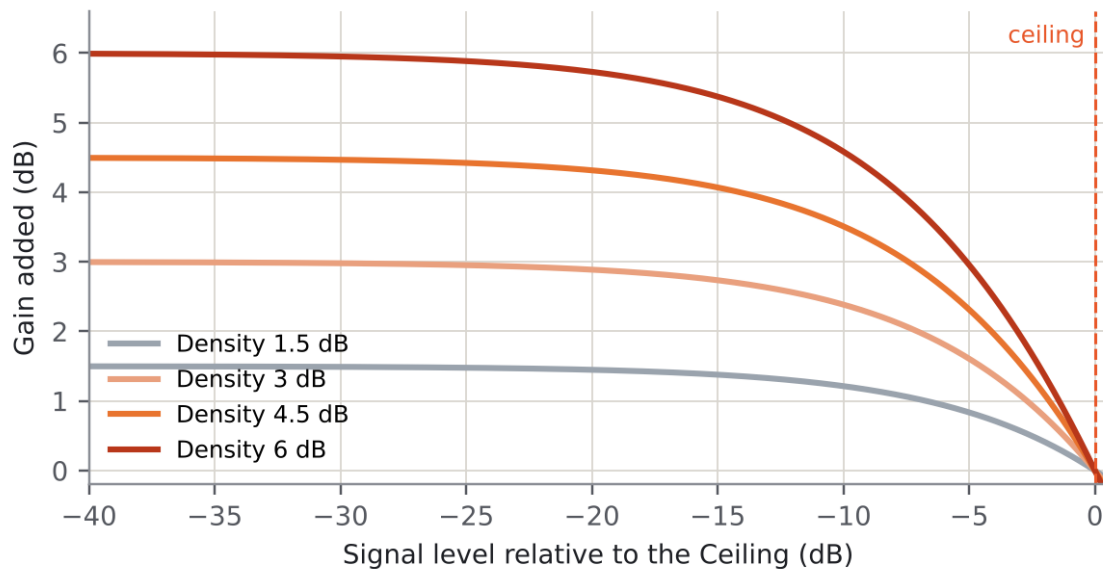


Figure 1. Gain added by Density versus how close the signal is to the ceiling.

Signal level (re. ceiling)	Density 2 dB	Density 4 dB	Density 6 dB
-40 dB	+2.0	+4.0	+6.0
-20 dB	+1.9	+3.8	+5.7
-12 dB	+1.7	+3.4	+5.0
-6 dB	+1.2	+2.4	+3.4
-3 dB	+0.8	+1.4	+2.0
-1 dB	+0.3	+0.5	+0.7
0 dB (ceiling)	0.0	0.0	0.0

Table 1. Gain added (dB), computed from the plug-in's formula.

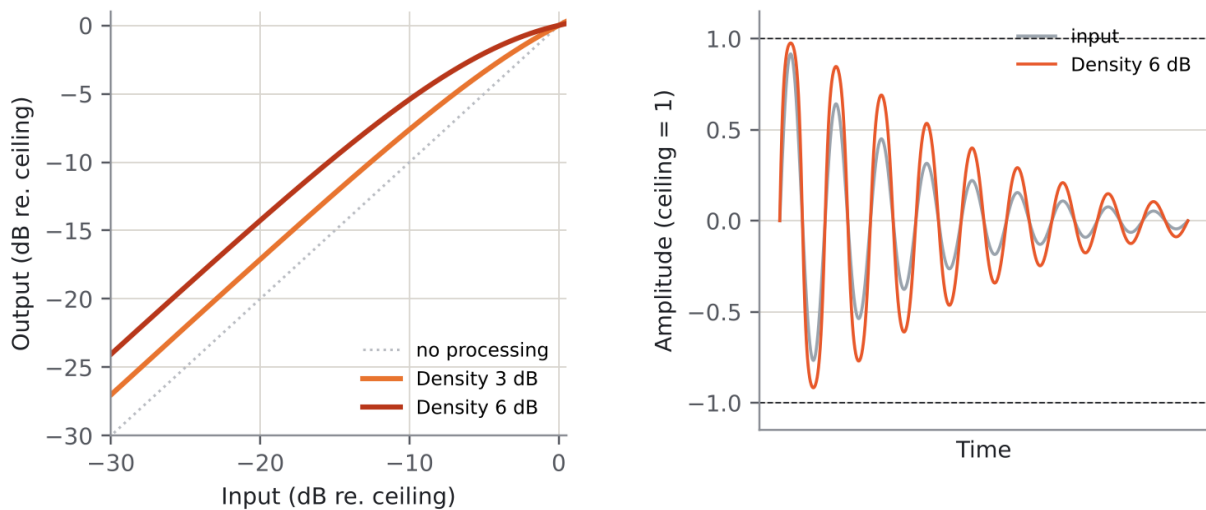


Figure 2. Left: Density as a transfer curve. Right: a decaying note. Density lifts the tail while the first peak stays at the same height.

Tip. Density makes the track louder, so it always sounds 'better' at first. Use **UNITY** to hear what it really does at matched level. Typical settings: 1 to 3 dB on a mix bus, 3 to 6 dB on drums or for aggressive masters.

5 Silk in depth

Clipping creates upper harmonics, which can sound brittle on bright material. Silk is a **dynamic high shelf** placed right after the clipper: it gently lowers the top end, but only at the moments the signal is being pushed into the ceiling. When the music is quieter, Silk does nothing at all, so it does not dull the track the way a static EQ would.

How the knob is mapped

Stage	Detail
Detector	Peak envelope of the signal entering the clipper (after Input and Density), relative to the ceiling. Attack 0.5 ms, release 80 ms.
Engagement	Starts when the envelope reaches -5.2 dB below the ceiling and is fully engaged at +0.4 dB, following a smooth S-curve.
Amount	Silk knob, 0 to 100 %, linear. HF gain = $1 - 0.25 \times \text{Silk} \times \text{engagement}$, so 100 % gives a maximum cut of -2.5 dB.
Filter	First-order shelf around 3.8 kHz. At full Silk and full engagement: about -0.4 dB at 2 kHz, -1.3 dB at 5 kHz, -2.2 dB at 20 kHz. Nothing below 1 kHz is touched.

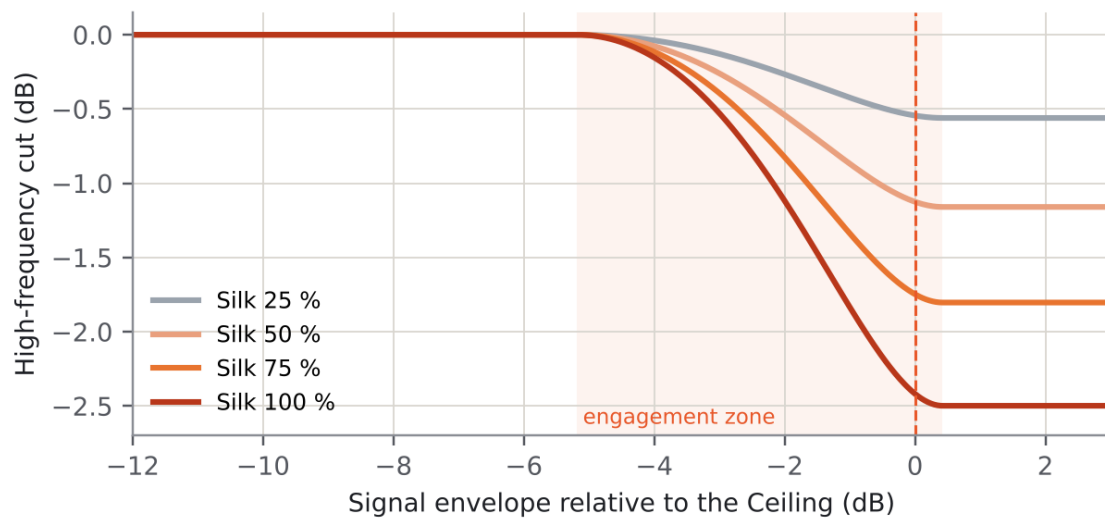


Figure 3. How much top end Silk removes as the signal approaches and passes the ceiling.

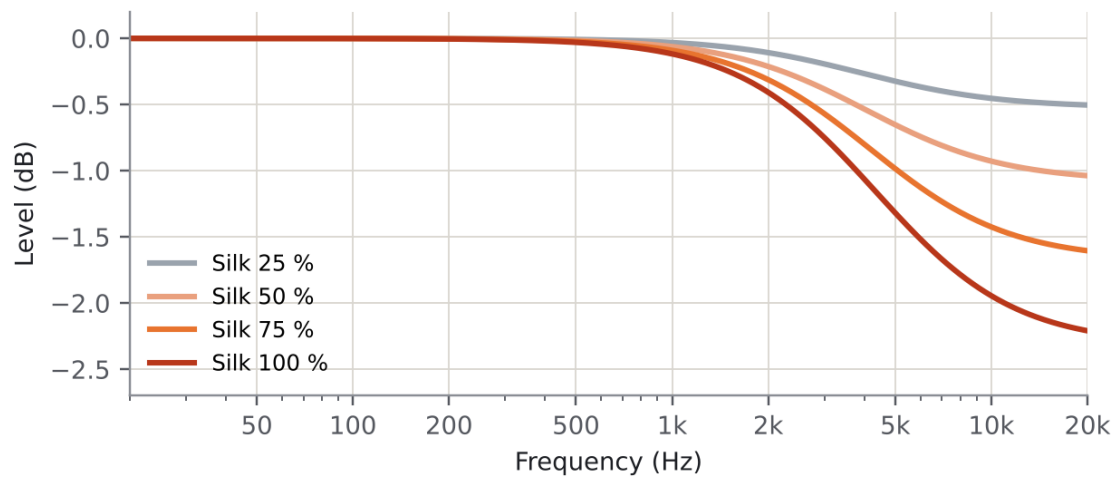


Figure 4. Silk's frequency response when fully engaged, for four knob settings.

Tip. Silk is a polish control, not a tone control. Start around 40 %, push the clipper, and listen to cymbals and vocal sibilance on the loudest hits. If the top end still bites, raise it; if the hits sound dull compared with the verses, lower it.

6 Clip modes

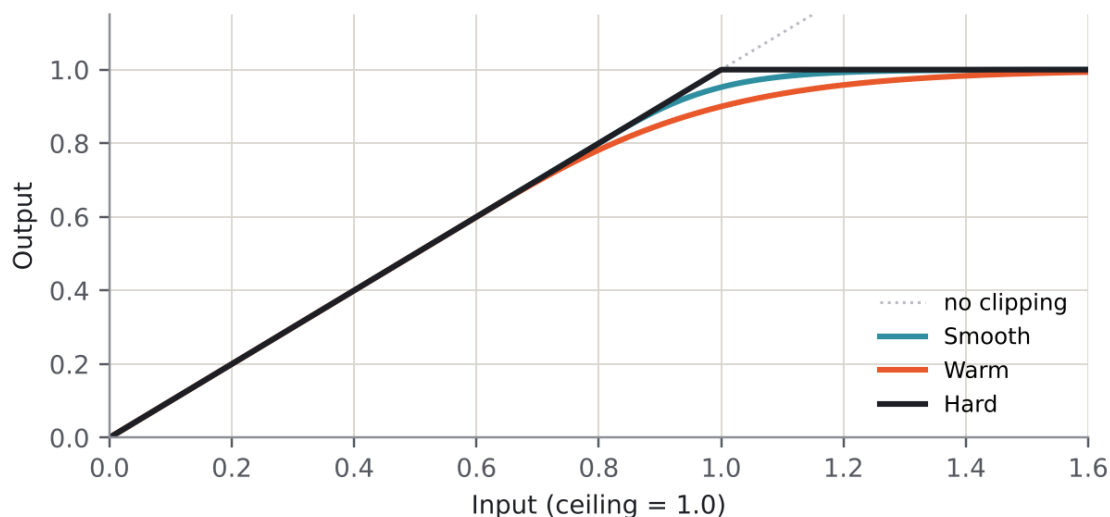


Figure 5. Transfer curves of the three modes (positive half shown).

Mode	Where shaping starts	Character
Smooth	-1.9 dB below the ceiling	Clean right up to the top, then a short rounded shoulder. The most transparent mode for masters.
Warm	-4.7 dB (positive half), -6.7 dB (negative half)	Earlier, rounder shoulder. The different knee per polarity adds a little even-order colour when you clip, while staying perfectly clean and symmetrical below the knee.
Hard	exactly at the ceiling	Untouched until the ceiling, then a hard stop. Loudest and punchiest; needs oversampling to stay clean.

7 Multiband page

Select **MULTIBAND** under PAGE in the SYSTEM module to open the page (MAIN returns), and switch the processing on with the **MULTIBAND ON** LED in the same module. The signal is split into Low, Mid and High bands. Each band is clipped on its own, then the bands are summed and sent on to Density and the main clipper. This lets you control a booming low end without dragging the vocals and hats into the clipper with it.

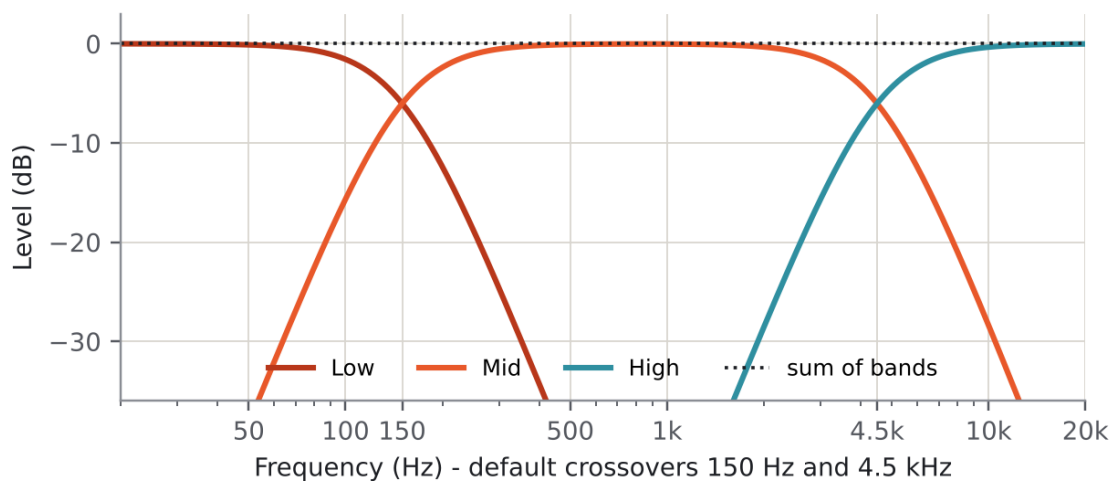


Figure 6. Band responses at the default crossovers. The bands sum back to a perfectly flat response.

The crossovers are 24 dB/octave Linkwitz-Riley filters with phase alignment between the bands. They add **no latency**, and with every band untouched the multiband stage is transparent (flat within 0.05 dB in testing). The dry path receives the same phase alignment, so parallel blending stays comb-free.

Control	Range	Mapping and behaviour
Low Mid	40 Hz to 1 kHz (default 150 Hz)	Low/mid crossover. Logarithmic knob.
Mid High	1 to 16 kHz (default 4.5 kHz)	Mid/high crossover. Always kept at least 1.5x above Low Mid.
ON (each band)	on / off	The LED in each band's title bar enables that band's clipper. A bypassed band passes through unclipped (its Level still applies).
Clip	0 to 18 dB	Drive into the band clipper. Level-compensated : it changes how hard the band is clipped, not how loud it is.
Knee	0 to 100 % (default 50 %)	Where the band's shaping starts below the ceiling: 0 % = hard corner at the ceiling; 25 % = -2.2 dB; 50 % = -5.2 dB; 75 % = -9.8 dB; 100 % = -20 dB (gentle saturation).
Mix	0 to 100 %	Per-band dry/wet.
Level	-12 to +12 dB	Band volume after clipping. Use it to rebalance the bands.
Band meter	0 to 12 dB	The LED row at the top of each band shows dB clipped in that band.

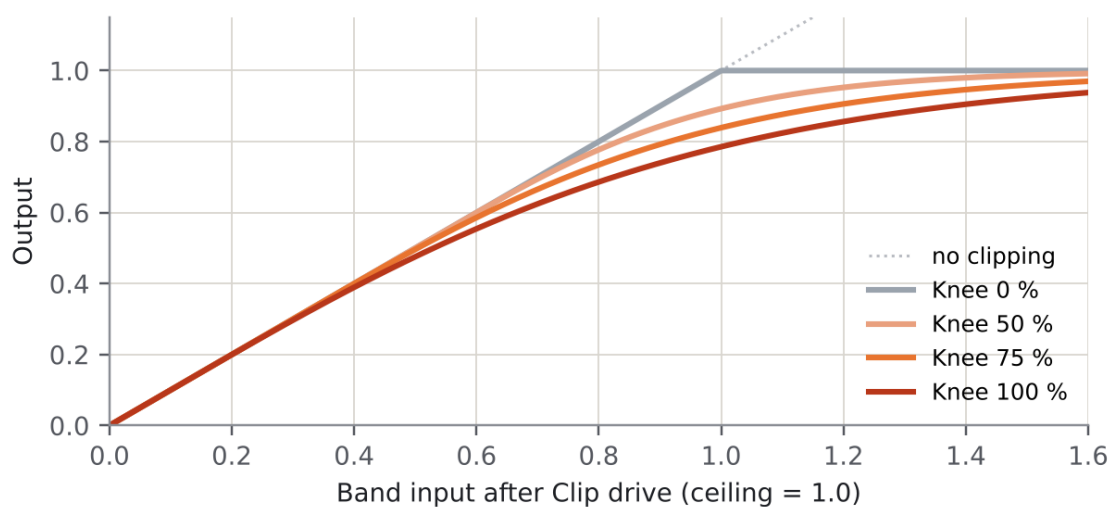


Figure 7. Band clipper curves for four Knee settings.



Ember Clip, Multiband page.

8 Oversampling and latency

Clipping creates new high-frequency content. At the normal sample rate, anything above half the sample rate folds back down as inharmonic, harsh distortion called aliasing. Oversampling processes at a higher internal rate so those products can be filtered out first. In testing (hard clip, 5 kHz tone, +12 dB drive), aliasing measured -17 dB at 1x, -35 dB at 2x, -40 dB at 4x and -41 dB at 8x relative to the wanted harmonics.

Setting	Min phase (default)	Lin Phase	When to use
1x	0 samples	0 samples	Tracking or live use where zero latency matters. Expect more grit when clipping hard.
2x	4 samples	49 samples	Light CPU, decent quality.
4x	5 samples	60 samples	Recommended default for mixing and mastering.
8x	5 samples	65 samples	Maximum quality for heavy clipping or Hard mode; highest CPU.

Latency is reported to FL Studio automatically, so plug-in delay compensation keeps everything in time. Min-phase filters add a tiny phase shift near the top of the audio band; Lin Phase removes it at the cost of more latency. Either way, the dry path is aligned to the processed path.

9 Recipes

Transparent master loudness

Smooth, 4x, Guard on, Ceiling -0.3 dB. Input until CLIP shows 1 to 2 dB on the loudest hits, Density 2 dB, Silk 30 %. Check with Unity and Delta.

Heavy trap / drill master

Multiband on. Low band Clip 4 to 8 dB, Knee 25 %; Mid band Clip 2 dB, Knee 50 %; High band off. Main clipper Warm, Density 3 dB, Silk 50 %, 8x.

Tame a booming 808

Multiband on, Low | Mid around 120 Hz. Raise only the Low band's Clip until its meter shows 2 to 4 dB. Leave the main clipper light.

Parallel drum crush

On a drum bus: Split on, Wet 0 dB, Dry 0 dB. Hard mode, Input +10 dB or more. Pull Wet down until the crush sits under the clean drums.

Bottom-up saturation

Split on, Dry 0 dB, Wet around -12 dB, Warm mode with lots of Input. Adds density and harmonics underneath while the original transients stay on top.

10 Ember Clip parameter reference

Automation names as they appear in FL Studio, with ranges and defaults.

Parameter	Range	Default	Scaling
Input	-12 to +24 dB	0 dB	linear dB
Density	0 to 6 dB	0 dB	linear dB
Ceiling	-24 to 0 dB	0 dB	linear dB
Mode	Smooth / Warm / Hard	Smooth	choice
Silk	0 to 100 %	0 %	linear
Air Trim	off / on	off	switch
Oversampling	1x / 2x / 4x / 8x	4x	choice
Linear Phase	off / on	off	switch
Mix	0 to 100 %	100 %	linear
Split Dry/Wet	off / on	off	switch
Dry Level	Off (-60) to +6 dB	Off	dB, centre -12 dB
Wet Level	Off (-60) to +6 dB	0 dB	dB, centre -12 dB
Unity	off / on	off	switch
Output	-24 to +12 dB	0 dB	linear dB
Delta	off / on	off	switch
Guard	off / on	on	switch
Multiband	off / on	off	switch
Low/Mid Crossover	40 Hz to 1 kHz	150 Hz	logarithmic
Mid/High Crossover	1 to 16 kHz	4.5 kHz	logarithmic
Low / Mid / High On	off / on	on	switch
Low / Mid / High Clip	0 to 18 dB	0 dB	linear dB
Low / Mid / High Knee	0 to 100 %	50 %	linear
Low / Mid / High Mix	0 to 100 %	100 %	linear
Low / Mid / High Level	-12 to +12 dB	0 dB	linear dB

Interface tips. Double-click any knob or fader to return it to its default. Drag to turn; click the value under a control to type a number. The window can be resized from the bottom-right corner.

Ember Clip is an original plug-in by Ember Audio Labs, built with JUCE. Its algorithms and interface are its own. This manual describes version v1.5.