

# bx\_clipper

## Plugin Manual



The first choice of clipping.

Developed by Brainworx Audio and distributed by Plugin Alliance

**BRAINWORX**  
by Native Instruments

 **Plugin Alliance**  
by Native Instruments



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## Plugin Manual Overview



### Experience the Ultimate Clipping Solution with bx\_clipper - Where Ease of Use Meets Uncompromised Sound Quality!

bx\_clipper is the first dedicated clipping plugin developed by Brainworx Audio. Inspired by analog circuits but designed from the beginning as a purely digital tool, it combines the best aspects of both worlds into a versatile tool with a modern, intuitive interface and a distinct sonic signature not found in other, purely digital clipping plugins. Our goal was to find just the right balance of features and ease of use to allow the seasoned engineers a wide palette of sounds while still getting the job done with just a few parameter adjustments in the hands of an up-and-coming enthusiast.

Clippers are, in general, fairly simple devices, their only purpose being to shave off the tops of a waveform above a certain threshold. This in turn allows for the signal to be played back louder at the same peak level. The sonic signature of that processing however turns out to differ significantly depending on the implementation details. The two most important aspects of that - the knee shape and the oversampling, have been crafted with great care in the bx\_clipper to achieve superb-sounding results with a minimum amount of unwanted artifacts, all within a very competitive CPU footprint and with a latency of just 64 samples.

The core clipping engine offers two modes of operation - Diode and FET, named after the analog elements, most often found in analog clipping circuits. While there is an almost infinite number of diodes available, almost all of them follow the same principle of operation, and thus

adhere to the same mathematical equations, differing only in the model parameters. The same is also true for the Field-Effect-Transistors. For that reason, the two modes of operation in combination with the ceiling and knee controls, cover a truly large scope of possible analog implementations, with the convenience of a digital design and interface. The knee control will alter the „diode voltage drop“ in Diode mode and the „saturation current“ in FET mode, effectively setting the transition range - knee - between the inactive/linear region and hard-clipping. Lower settings will be more akin to the characteristics of an input stage of an AD converter while higher settings venture right up to the edge of the guitar pedal territory.

Two immensely useful pure-digital features are the Auto Ceiling and the Auto Trim. The Auto Ceiling, when engaged, will look at the input signal and register signal peaks. When exiting the measurement mode, the Ceiling parameter will be set to the inverse value of the highest detected peak. This will let the input signal take advantage of the whole soft-knee transition range while never going into hard-clipping, providing the biggest gain in perceived volume without introducing any meaningful aliasing. The Auto Trim feature on the other hand is looking at the RMS difference between the input and the processed signal which, when applied, enables equal-loudness comparison and evaluation, and allows the plugin to be bypassed in the middle of a processing chain without meaningfully changing the operating points of all the processors after it.

**Just like most of our other Brainworx products, the bx\_clipper features dual-mono and MS operation modes.**



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### Global Controls

#### 1 Mid/Side

Enables or disables the stereo-to-mid-side encoding at the start of the signal chain and decoding at the end of it. The labels on the GUI will change to reflect that mode of operation and designate the left channel as „M“ and the right channel as „S“.

#### 2 Parameter Link

When switched on, this feature links the channel parameters of both channels to allow for easier and faster work on stereo material.

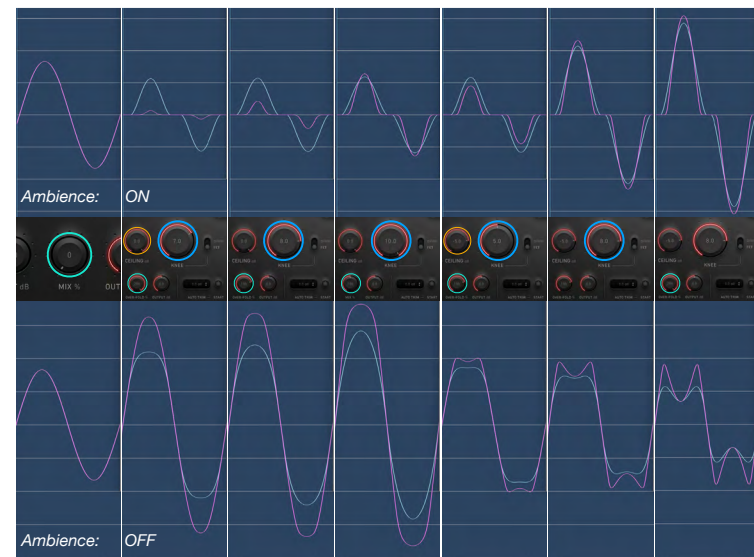
#### 3 Ambience

The Ambience control, inspired by the one found on the Amek 9099 console, sends the difference between the dry and the clipped signal to the output. This allows to clearly audit the loss of information generated by the clipping-process.

### AMBIENCE Artifacts

The artifacts exposed by our AMBIENCE circuit vary from common dynamic artifacts due to the absence of timing parameters and common saturation. The ambience signal of the bx\_clipper reflects „the lost peaks“ of your audio - or, in a more technical term - „the difference“ of your dry and wet audio signal. With many different settings, these spikes can lead into stunning distortion- and crushing-effects without applying common overdrive of amplification. In this special case, the distortion is what's getting lost in amplification when overdriving a signal through a diode or FET amplifier.

Have a look at the settings and the resulting amplitude to have a better picture of what is happening here:



Blue = FET, Pink = Diode



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### Channel Controls

#### 1 Input Level

An input level control with a range, tailored to the usual operation of a clipper. Allows for enough attenuation to keep hot input signals in check and enough gain to seriously destroy any incoming signal even if it's very low-volume. In M/S Mode, the left and respectively right value boosts/attenuates the Mid and respective Side channel of your input signal.

In M/S-Mode, it is very helpful to boost the side-signal about +6dB pre- and attenuate -6dB post-process to reach saturation and clipping without moving the side's ceiling almost into the noise floor.

#### 2 Ceiling

This is basically a headroom control around the main clipping engine. The level setting corresponds to the hard-clipping threshold and represents the maximum output level if not driven into serious

hard-clipping. In that case, the downsampling reconstruction filter will produce overshoots usually on the order of a few tenths of a dB.

#### 3 Auto Ceiling

Puts the unit in an input signal peak measurement mode. When exiting by hitting the ✓-Symbol, it will apply the displayed value to the ceiling control and thus set it to a point where the whole soft-clipping range is utilized without going into hard-clipping. This is useful for setting the unit up in a way that maximizes perceived loudness increase with no/minimal aliasing. Hitting the x-symbol in the Auto-Ceiling's display, leaves the measuring mode discarding it's result.

#### 4 Knee

This parameter decides the length of the transition range between no- and hard-clipping, generally referred to as the soft knee. Bigger values mean a longer transition range, resulting in more soft saturation before hard clipping and more gain for the un-clipped portion of the signal.



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### 1 Knee Type

The Diode knee type emulates a diode clipping stage, following the exponential-law equations. The FET knee type emulates a Field-Effect-Transistor-based clipping stage, following the power-law equations.

### 2 Start (Auto Trim)

This button triggers the RMS measurement of the input and output signals. After the measurements converge to stable values, the mode will exit and apply the difference to the Auto Trim control. The result is usually a very well-matched output level in comparison to the input signal, allowing for bypassing the plugin in the chain without issues and assessing the processed sound without the loudness bias.

### 3 Output Level

A regular old output volume control. In M/S Mode, the Left and respective Right value boosts/attenuates the Mid and respective Side-channel of your processed signal.

### 4 Auto Trim

An additional output level control, dedicated to the Auto Trim functionality. These two are intentionally decoupled, so the auto-trim function will not break any previous output level settings and/or automation.

### 5 Mix

This particular implementation of the Mix control covers the usual 100% in the first half of the range, and extends into over-fold distortion in the second half. It's barely noticeable in low knee settings and becomes increasingly more apparent at higher knee settings and clipping amounts, making the source sound even brighter and mercilessly destroying the transients.





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### Meter List

#### 1 Input

A sample-peak meter with the tap positioned right after the input gain and MS encoder.

#### 2 Output

A sample-peak meter with the tap positioned at the output of the plugin.

#### 3 Clip

Displays the amount of peak reduction on the wet signal before the mix control.

#### 4 WAVE

The WAVE display was shown in the descriptive screenshot before this page. It displays the last 4s history of the input (red) and the output waveforms (white) before and after the clipping engine.

#### 5 GRAPH

Rectified depiction of the in- and output-signals in addition of a corresponding red „Ceiling-line“ and the gain-reduction caused by the bx\_clipper.

#### 6 KNEE

Displays the input- (x-axis) and the clipped output-levels (y-axis). The signal is also highlighted as a moving point on the curve to visually monitor the range in which the clipper is operating. The diagonal curve visualizes your „Knee“ and „Ceiling“ settings reflecting any dynamical changes of the clipping-process.

#### 7 Solo

Once activated, the Solo buttons allow isolated monitoring of one channel at a time.

This is especially useful for setup and observation of unwanted artifacts when working in M/S mode, you won't listen to speaker-separated mid & side signals as you would in stereo mode.

#### 8 Bypass

The Bypass buttons simply turn the concerning channel's processing off. In- and Output Volume Parameters stay active.



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### Bottom Toolbar

#### 1 PA Logo

Clicking the Plugin Alliance logo takes you to the Plugin Alliance website via your web browser, that's if your computer is online.

#### 2 Key (Icon)

Clicking on the key icon brings up the activation dialog, allowing you to manually reauthorize a device in the event of a license upgrade or addition. You can also use this feature to activate additional computers or USB ash drives.

#### 3 ? (Icon)

Clicking the ? icon opens up a context menu that links to the product manual PDF, as well as other helpful links, e.g. to check for product updates online. You must have a PDF reader installed on your computer to be able to read the manual.

### BX Toolbar

#### a Power

Activates the plugin or switches into bypass.

#### b UI-Scale

Sets the size of the plugin's User Interface.

#### c Hide/Show

Hides or shows the second/right channel of the UI.

#### d Undo/Redo

#### e Bank

Switches between four different banks of settings per preset.

#### f Copy/Paste/Reset

Copies or resets the selected bank. Paste will overwrite the active bank.

#### g Oversampling

Sets the oversampling, its default is 8x, but ranges from 4x up to 32x. Oversampling increases CPU usage but can reduce aliasing.

#### h UI Color

Changes the primary color of controls and meter indicators.





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### Modifier Keys

Tested with Logic Pro X, Protools, Cubase and  
Presonus Studio One Mac/Win.

#### AU

Fine Control = Shift  
Jump between Default / Last Setting = Option  
Output Link = Command

#### VST / VST3

Fine Control = Shift  
Jump between Default / Last Setting = Command (Mac), Ctrl (Win)  
Output Link = Option (Mac) / Alt (Win)

#### AAX

Fine Control = Command (Mac), Ctrl (Win)  
Jump between Default / Last Setting = Option (Mac), Alt (Win)  
Output Link = Shift

### System Requirements & FAQ (Links)

#### For latest System Requirements & Supported Platforms

<https://www.plugin-alliance.com/en/systemrequirements.html>

#### Particular details for your product

<https://www.plugin-alliance.com/en/products.html>

#### Installation, Activation, Authorisation and FAQ's

<https://www.plugin-alliance.com/en/support.html>

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