

ClipShifter

LVC-Audio



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- **iLok** is a technology and trademark of PACE Anti-Piracy, Inc.
- **WDL-OL**: Enhanced version of Cockos IPlug/WDL by Oli Larkin (<https://github.com/olilarkin/wdl-ol>)

- **Knobman** and **Skinman**: from g200kg (http://www.g200kg.com/index_e.html)
- **Ubuntu Font Family**: (<http://font.ubuntu.com/>)
- ClipShifter uses portions of **fmath.hpp** and **Xbyak** for fast math calculations. Both source codes Copyright © 2010, 2012, Mitsunari Shigeo under the BSD 3-Clause License. More information is available at <http://homepage1.nifty.com/herumi/soft/fmath.html> and http://homepage1.nifty.com/herumi/soft/xbyak_e.html.

Welcome, Thanks, and Contact Information

Thank you for installing and trying ClipShifter. We hope you find this a useful tool in your audio chain, and we would like to hear your suggestions for future enhancements. Please feel free to contact LVC-Audio with any ideas, problems, suggestions, or comments at lvcaudio.com/contact/. Please visit lvcaudio.com for additional news about ClipShifter and other plugins. Additionally, you are welcome to join the LVC-Audio newsletter for the latest updates, new plugins, and sales events. To sign up for the newsletter, visit <http://lvcaudio.com/newsletter/>.

Introduction

ClipShifter is a plugin designed to provide saturation and clipping effects to your audio. This can be useful for individual tracks, busses, and overall mixes. The sonic characteristics of the clipping distortion can be altered from hard, brickwall-style clipping, to softer saturation with compression. The unique threshold controls for ClipShifter's clipping can be set to dynamically change based on the transient characteristic of the audio.

ClipShifter is released as a free and paid plugin. Paid features are explicitly indicated in this manual.

Initial Setup and Requirements

WINDOWS (VST, VST3, RTAS, AND AAX FORMATS):

System Requirements: ClipShifter requires Windows Vista or later, as 32-bit or 64-bit host, and a processor that supports SSE2 (AMD or Intel processor from around 2004 or later).

Installation: To install the software, download and unzip the latest file from the LVC-Audio website. Double-click the installer file to begin the process. The installer will prompt you for the installation location of the VST 32-bit folder, and VST 64-bit folder. The 64-bit plugin will include an "x_64" at the end of the filename. In most DAWs, this should help differentiate between the 32-bit and 64-bit plugins.

If VST3, RTAS, and/or AAX plugin formats are installed, they will be installed within the default folder(s) for each format. The RTAS format is 32-bit only. The AAX version is 64-bit

only. AAX should primarily be used within Pro Tools 11. In addition, the AAX plugin format requires the use of a registered iLok device.

OSX (AU, VST, VST3, RTAS, AND AAX FORMATS):

System Requirements: ClipShifter requires OSX 10.5 or later, a 32-bit or 64-bit host, and an Intel Core2Duo (or better) processor.

Installation: To install ClipShifter, click to unzip the Zip file. Double-click on the Package file to start the installation process. By default, ClipShifter will be installed as Audio Units, VST, and VST3 Universal Binaries. Additionally, AAX and RTAS formats will also be installed. The RTAS format is 32-bit only. The AAX version is in the Universal Binary format, but may not work properly in Pro Tools version 10 or below. AAX should primarily be used within Pro Tools 11. In addition, the AAX plugin format requires the use of a registered iLok device.

Any of the plugin formats can be excluded from installation by unchecking the checkboxes during the installation process.

REGISTERED USERS:

When updating ClipShifter from an older version, it may be necessary to close and reload ClipShifter. This is a particular concern when you have projects saved in your DAW and update ClipShifter to a newer version. If ClipShifter starts as the Demo Version, and you are sure that your registration file is in the correct directory, close ClipShifter from within your DAW and then add it again to your project. This should resolve the issue. For any further issues related to registration or changing plugin versions, please use the contact page at lvcaudio.com/contact/.

User Interface

ClipShifter is organized into three main sections: the waveform history view, the input and output VU meters, and the control settings.



Button and Selector Features: The main controls of ClipShifter are adjusted by using various knobs and buttons. For buttons such as Bypass or Solo, clicking the button one time will enable the feature. Clicking a second time will disable the feature. Some buttons, such as Oversample, contain more than two different setting (i.e., more than on and off). Each click of the button will cycle the control through all of its settings.

Knob Control Text Entry: [not available for RTAS format] For each of the knobs in ClipShifter, the text value is displayed below. Manual entry of values can be entered by clicking on the text field, and typing in the desired value. If a value is entered that is greater than the control's maximum value, the control will automatically be set to the maximum value. Conversely, values that are less than the control's minimum will be set to the control's minimum value. When entering a value on a control which ranges from negative to positive numbers (e.g., -6 to +6), a negative/minus must be used. For controls that have a maximum value of 0 (e.g. -44 to 0), the negative/minus sign can be omitted.

Knob Control Scrolling and Dragging: When hovering over a knob, the mouse wheel can be used to increase or decrease the value of the control. Scrolling produces large changes in the knob's value. If finer control is needed, the Alt key can be held down while scrolling. When more subtle adjustment is needed, the Shift key can be held down for minute changes.

Similarly to using the scroll wheel to adjust a knob, the control can be set by clicking and dragging the knob up and down. This produces large changes in the control's value. For finer control, the Alt key can be held down while dragging the control. Additionally, the Shift key can be held down for very small changes.

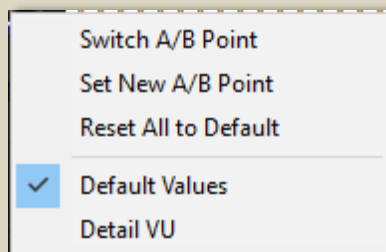
Please note: RTAS and AAX plugins have slightly different key modifiers based on how typical Pro Tools plugins operate.

Knob Control Reset and A->B Features: Double-clicking (or clicking while holding the Control key) on any knob or slider will return the control to the default value. At the same time, the previous value of the control is stored. Double-clicking the control again will change the control from the default value back to the previous setting. Using this double-click feature, it is very easy to make A->B type comparisons on each of the controls.

Sometimes it might be desirable to compare two values that are not the default value. This can be accomplished by right-clicking on the control. Right-clicking on a control will set a new default value. After this is done, the knob can be readjusted. After double-clicking on the control, the control will be reset to the newly defined default value.

Each time right-click is used on a knob, a new default value will be established. If it is necessary to reset a knob to the factory default value, this can be accomplished by holding down the Shift key while right-clicking on a knob. The knobs default value will be reset to the factory default.

Please note: Knob A/B values are not saved, and are separate for each instance of the plugin. When the plugin is closed or a saved session is reloaded, each knob's A and B values will be reset to the factory default values.



Knob Control Drop-Down Menu and Alternate Settings: Each knob control features a drop-down menu that can be used to compare two values, to reset the knob, or to set an alternate knob range. To access the drop-down menu, use the right mouse button to click on the knob. In some DAW software, the right-click button is not accessible by the plugin. It can also be accessed by holding the Control and Shift keys down while clicking the left mouse button. The first three items are

the same features that are also accessible by using the mouse and keyboard modifiers (see Knob Control Reset and A->B Features).

For certain controls, alternate settings are also accessible. Alternate settings are different settings for the knob's default value, minimum value, maximum value, precision (i.e. number of decimal points), and scale (e.g., linear versus logarithmic). Selecting one of the items from the menu will change the settings of the control.

Undo/Redo: At the bottom of the plugin interface are the Undo and Redo buttons. The Undo button looks like an arrow that points to the left, and the Redo button looks like an arrow that points to the right.



Clicking the Undo button will undo the last user change to the plugin. The undo history holds up to 100 different user changes. Conversely, clicking the Redo button will reapply the last changed setting. If the Undo or Redo buttons are grey, it means that no Undo or Redo is possible.



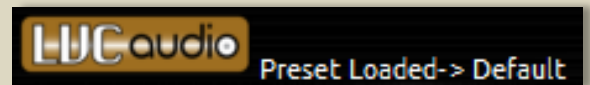
A/B Plugin Comparison: The A/B Comparison buttons also appear on the bottom of the plugin interface. The buttons provide a quick and easy method to compare two different plugin configurations. These configurations are the "A" state, and "B" state.

Clicking the A button will save the current plugin configuration to the A state, and then load the B state plugin settings. The button will change to indicate the letter B. Clicking the button again will save the current plugin state, and reload the A state. Any number of controls can be changed, as they are automatically saved before the plugin switches to the other plugin state.

The Copy-to button (appearing as an A->B in the picture), copies the current plugin state to the other plugin state. For example, if the plugin is in the A state and the A->B button is pressed, the current plugin state will be copied to the B state. If the plugin is switched to the B state after pressing the Copy-to button, the settings will appear to remain the same because the A and B states are identical.

Please note: When a preset is loaded from the LVC-Audio Preset Menu, it will be loaded and saved into the current state. The other plugin state should not be affected. This may not be the case when saving and loading settings from the DAW (i.e., both plugin states may be copied over with the loaded settings).

Messaging: During certain times, ClipShifter will display information at the top of the plugin. Typically, messages relate to saving and loading presets or alternate knob settings. The message will appear for a few seconds before disappearing.





About Box: Clicking on the LVC-Audio logo at the top of the plugin will display the About Box. The About Box displays basic information, including the plugin name, plugin version, DAW, plugin format, architecture (32- or 64-bit), and registration file location (if applicable). Furthermore, a button at the bottom of the About box provides a link that will check for the latest version of the plugin. This loads the ClipShifter plugin page in your

default web browser. To close the About box, click the Close button, or anywhere within the plugin's GUI.

VU METERS

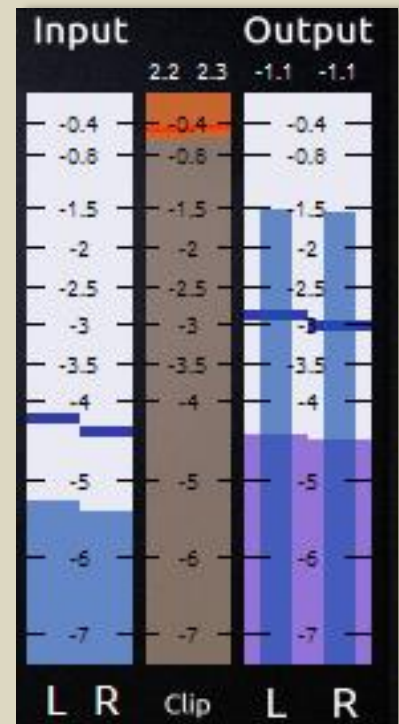
VU and Peak Program Meters: The audio meters on ClipShifter display information about the input and output levels. The input meters display the signal level after gain is applied through the Input Gain. Typically, the input meter shows the Left and Right signal. When the Mid/Side switch is enabled [PAID FEATURE], the meter displays levels based on the mid and side levels. The output meter shows the final level of audio as it leaves the plugin.

The meter bars responds similarly to traditional VU meters, but with a quicker rise time (near instantaneous integration time, and 300ms to decrease -20 dB). The dash meter responds more closely to a Peak Program Meter (PPM), with a slower rise and fall (5ms integration time, and 3 seconds to decrease -20 dB). All meters are calibrated as 0dBFS, meaning that any signal that maximizes the meters represents digital clipping.

Clipping Amount Indicators: The orange meter in the middle displays information about the amount of clipping reduction by applied to the signal. The dark orange meter shows the amount of clipping that is occurring to each audio track (left/right, or mid/side). The responses timing of the clip reduction meter is the same as the input and output meters (near instantaneous integration time, and 300ms to decrease -20 dB). The solid lines displayed within the clip meter are similar to the Peak Program Meters. They allow easy visual feedback regarding the amount of clip reduction.

Loudness Output Meter: An additional feature of the Output meter is a loudness indicator. This is the smaller rectangular area within the output VU bar. This indicates the relative loudness of the output. The top of the area is determined by the peak output level. The bottom of the area is determined by the RMS value of the output. The peak output is determined using a meter that has a fast attack time, with a long decay time (i.e., near instantaneous attack time, with a 2.5 second decay time). The bottom RMS point of the meter uses a 750 millisecond time for both attack and release.

The height of the bar relates to the dynamic range of the material. When heavy saturation or clipping and the output levels approach 0dBFS, the loudness meter will be shorter (i.e. representing little difference between the peak of the audio and the RMS value). Audio with more dynamic characteristics will have a relatively broader loudness meter. Although this can be useful in determining the overall level of dynamic range, the meter is less accurate at lower audio levels.



Please note: The Loudness Output Meter will vary greatly depending on the dynamic nature of the source material. Naturally, loud and compressed signals (e.g., distorted guitars) will have a limited dynamic range prior to any processing that is occurring with ClipShifter.

Output Level and Clipping Level Text: Above the Output meters are a text readout of the current output levels in decibels. These numbers have an instantaneous integrations time, and a long decay time. The numbers will only display volume levels above -60dB. Signal levels below -60dB will not be displayed. Any signal that is above 0dBFS will be displayed in **red text**, indicating digital clipping. To reset the values, click on the numbers. This will automatically reset the numbers to the default -60dB value.

MAIN CONTROLS



The main control interface of ClipShifter contains various controls for changing the gain of the audio, controlling the clipping settings, and adjusting the sonic characteristics of the clipping.

In and Out Gain: The In Gain control applies gain before any processing occurs. Conversely, the Out Gain applies gain after all processing is finished and before the signal is routed to the audio host.

Initial and End Threshold: The larger Threshold controls change the clipping amount. The section has two knobs used to set the clipping threshold (Initial and End). These settings are used in conjunction with the Attack and Release controls to shift the threshold of clipping based on the level of the input signal. ClipShifter dynamically alters the clipping threshold between the Initial and End settings. After the input signal reaches the level set by the Initial Threshold, the actual threshold of the plugin begins to change toward the amount set by the End Threshold. The quickness of the shift is determined by the Attack control.

After the signal decreases below the threshold, the actual threshold of the plugin begins to shift back towards the Initial Threshold setting. This is controlled by the Release control. The vertical indicator below the Initial and End controls shows the position of the actual clipping

threshold, with relation to the Initial and End controls. In addition, the actual clipping threshold can be viewed on the Clipping meters, and the waveform history display.

Link: The Link button locks the Initial and End thresholds to the same amount, and disables the Attack and Release Times. When the Link button is selected, the End Threshold, Attack, and Release knobs are temporarily grayed-out. Linking the two controls holds the actual threshold of the plugin to the amount set by the controls. While linked, the grayed-out controls have no impact on the audio, and the meters and waveform history will not show any Threshold change.

Mix Control: The Mix control is used as a wet/dry control to blend the output of ClipShifter with the input signal. The default setting of 100% corresponds to an output that is entirely processed audio. A setting of 0% corresponds to completely bypassing the plugin since the output will be entirely from the dry signal.

The Mix control compensates for any latency introduced via oversampling when mixing in the dry signal. Different DAW programs handle latency differently. Some hosts are able to change latency dynamically. Other hosts only change latency when the “play” button is pressed within the DAW software. **Since DAWs handle latency differently, it is advisable to use the Mix control within ClipShifter over using the any mix knob available within the DAW.**

When using the EQ Controls [PAID FEATURE], the Mix knob introduces an appropriate amount of phase shift onto the dry track. This is a necessity since using the mix knob without the phase shift would result in sharp decreases of output at the crossover frequency. The volume of the dry signal is not altered in any way, on the phase is altered to match the crossover points. **Since this phase shift is necessary when using the EQ Controls, any host mix knob should be avoided. Thin or hollow sounds can result when using the host’s mix control.**

Bypass: The Bypass button disables processing of the plugin. Although the meters continue to work, all controls within the Input, Output, and Threshold sections do not have any effect on the audio signal.

ADVANCED CONTROLS



The Advanced Controls can be accessed by clicking the ADV button. The Advanced Controls contain settings that directly affect the clipping algorithm, as well as controls for Oversampling and Double Processing. Oversampling and Double Processing are both features available in the paid version of ClipShifter.

Clip Shape: The Clip Shape controls the type of clipping applied to signals above the threshold. Setting the Clip Shape to 1.00 equates to a brickwall-style clipping (this is similar to clipping that occurs in electronics using diodes across the output of a signal chain). Anything above this threshold is cut drastically (i.e., a straight line). Decreasing the Clip Shape starts to soften the clipping (similar to diodes placed within the feedback loop of an opamp/transistor-based circuit). In addition, softer clipping (i.e., lowering the Clip Shape) will have a similar effect as compressing the signal. At the minimum Clip Shape setting, almost no audible clipping occurs, and ClipShifter approximates a compressor set at a low 1:1.5 ratio.

Harmonics: The Harmonics control adjusts the amount of even- and odd-order distortion while the signal is clipping. A setting of 1.0 will produce a symmetrical output signal that contains only odd-order harmonics. Settings less than 1.0 will increase the amount of even-order harmonics in the output.

Please note: settings less than one will also increase the overall gain of the output signal.

Attack: The Attack control determines how quickly the threshold shifts between the Initial and End threshold settings. When the input signal is above the Initial threshold, the internal clipping threshold begins to shift towards the End threshold setting. The Attack control determines how quickly or slowly this shift occurs.

Release: The Release control determines how quickly the threshold shifts between the End and Initial threshold settings, regardless if this is an increase or decrease. When the input signal falls below the clipping threshold, the internal clipping threshold begins to shift towards the Initial threshold setting. The Release control determines how quickly or slowly this shift occurs.

Threshold Control: The Threshold control determines how the internal clipping threshold is calculated. Three options are available, Independent, Maximum, and Average. This control has similar functionality to a compressor running in stereo mode, versus dual-mono mode.

In Independent mode (IND), each incoming channel is processed separately. Although the same controls (i.e., Initial and End threshold, Attack, Release) are used for both stereo channels, shifts to the internal clipping level are completely independent. This is similar to a compressor in dual-mono mode, with the controls set to the same level (i.e., ratio, threshold, attack, release, etc.).

In Maximum mode (MAX), the stereo channels are compared to find the loudest signal. The maximum signal is then used to determine changes to the internal clipping threshold. Similarly to Maximum mode, Average mode (AVG) uses an average of the two incoming channels. The result is that both stereo channels have the same internal clipping thresholds. The Clipping meters and Waveform History view will also reflect the these independent or link threshold settings.

Please note: Although there is only one clipping threshold for MAX and AVG mode, both signals still are processed individually. MAX or AVG mode does not switch ClipShifter into a mono plugin.

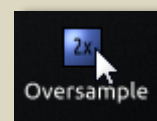
Oversampling [PAID FEATURE ONLY]: A problem with many audio plugins is aliasing artifacts. This occurs with certain algorithms that apply non-linear processing to the audio signal. It is especially prevalent at lower sampling rates (e.g., 44100 or 48000). The result is that additional audio content is present at unintended frequencies. This can sound like undesired distortion or harmonic ringing. In general, ClipShifter minimizes aliasing effects through the use of its internal clipping algorithm; however, certain situations can produce unintended audio artifacts.

Oversampling is a process that greatly minimizes alias effects. The general process is to increase the samplerate internally, process the audio, filter out all of the alias artifacts, and then down convert the samplerate. This occurs internally and the audio host application is not aware that any samplerate conversion is occurring. ClipShifter uses linear phase filtering during the oversampling process. This introduces some plugin latency (automatically compensated by the host DAW application); however, the phase response does not change.

ClipShifter has settings for 2x, 4x, and 8x oversampling. This means that audio is internally being processed at the samplerate of the track, times the multiple (e.g. 4x of a 44100 sample is up-converted to 176400 samples per second). The result is that most of the aliasing artifacts do not occur once the samples are filtered and returned to the original samplerate before passing to the host application.

Since oversampling involves processing 2, 4, or 8 times the amount of data as well as additional filtering, oversampling can tax the computer's CPU. Depending on the computer, this may appear as a CPU usage of 2 to 10 times the amount when compared with oversampling disabled.

Clicking the oversample button cycles through the various options (i.e. Off, 2x, 4x, 8x).



Please note: Oversampling involves filtering high frequency content of the audio. Depending on the frequency content of the source and the settings of the multiband frequency control, audible difference can exist between the different settings. This can sound like a slight decrease in the very top end of the audible spectrum (i.e., -1.5 dB at 20kHz). Less prominent high frequency loss occurs with higher source samplerates.

Double Processing [PAID FEATURE ONLY]: A byproduct of using Oversampling with ClipShifter is that output signals can sometimes exceed the Threshold levels set by the Initial and End Threshold controls. This is an inevitable effect of upsampling, waveshaping/clipping, and downsampling. The end result is that peaks may go +1 to +2dB above the Threshold,

depending on input gain, audio levels, and Threshold settings. This is undesirable in certain situations (e.g., when ClipShifter is being used as a brickwall limiter). The Double button is designed to remedy this particular problem.

When Double is engaged, the signal is processed through the clipping algorithm an additional time after oversampling. The same Harmonics and Clip Shape settings are during the Double processing; however, the entire signal is processed, regardless of the multiband frequency settings or mid/side settings. When Harmonics and Clip Shape are set to 1.0, the Double processing keeps the output within the Threshold settings.

The Double setting can also be used creatively. The result of processing an oversampled signal a second time through the algorithm will change the harmonic content of the distortion. This can be used in conjunction with the Clip Shape and Harmonics controls to alter the harmonic content of the distortion.

Please Note: When Oversampling is engaged, the Double button becomes accessible. This button is hidden when oversampling is off.

EQ CONTROLS [PAID FEATURE ONLY]

The EQ Controls are accessible by clicking the EQ button. The EQ controls feature a 3-way variable crossover control that can be used to tailor the sound of ClipShifter. The saturation/clipping processing can be selectively applied to any of the frequency bands. The controls include frequency selectors, process selector buttons, gain controls, solo buttons, and a gain select button.



Frequency Controls: The top two knobs control the frequency points of the 3-way crossover. The crossover utilizes a LR 4th order filter to split the audio into Low, Mid, and High sections. The default settings for the controls are 20 Hz for the Low control, and 20,000 Hz for the High control. When the controls are set to their default settings, the filters are disabled. As the knobs are changed from their default settings, the frequencies splits are engaged. When the filters are disabled, the corresponding controls are hidden.

For a 2-band processor, either the Low frequency or High frequency can be disabled. The result is that the audio is split into 2 distinct frequency bands (with the Mid either functioning and the High band when High is disabled, or functioning as the Low band with the Low is disabled).

Process Buttons: When the Frequency controls are engaged, the Process buttons are accessible. These buttons control how the frequency bands are processed through the clipping algorithm. **When all the buttons are disengaged, the entire signal is processed through the clipping algorithm (including any frequency gains). Conversely, when all of the three buttons are enabled, each frequency is processed individually through the clipping algorithm.** Although the same controls are used to determine the clipping threshold (i.e., Initial and End threshold, Attack, Release, etc.), each frequency band is processed independent of the other bands.

When some frequency bands are enabled and other bands are disabled, only the frequency bands that are enabled will be processed through the clipping algorithm. The disabled bands will pass through the plugin with all the appropriate gains (i.e., In gain, Out gain, any EQ gain). The disabled bands will also not affect ClipShifter's calculation for shifting the internal clipping threshold.

Please Note: The free version of ClipShifter processes the entire signal through the clipping algorithm. This is the same as having all of the Process buttons disabled.

Gain Controls: The gain controls change the gain setting of each of the Low, Mid, and High sections. They are closely related to the Gain Select button. By using the Gain Select button, the EQ gains can be moved to different points within the processing chain.

Solo Buttons: Clicking a solo button will mute the audio from the other frequency bands. This can be useful in adjusting the appropriate frequency split and/or volume. The waveform display will also change to show the soloed input and output only.

Please note: When Solo is enabled, the input gain displayed within the waveform history view and input VU meters show only the soloed audio. This includes any input gain and frequency specific input gain.

Gain Select: The Gain Select button controls how the EQ gains are applied to the signal. This has the effect of controlling when the gain occurs within the processing chain. The Gain Select control has three different options: In Gain, Out Gain, and SideChain.

When In Gain is selected, and frequency gains are applied immediately before the signal is routed through the clipping algorithm. The result is that the frequency gain control can be used to determine how much clipping is applied. When Out Gain is selected, the gain is applied to the signal immediately after the clipping algorithm. Gain that is applied to the output will not impact the amount of clipping, it will only effect to EQ of the output signal. When either In Gain or Out Gain is selected, the frequency gains can be used to tailor the sound. This is regardless of whether or not the frequency Process button is engaged or not.

When SideChain is selected, the gain is applied to both the input and output; however, the result is a 0 dB gain for that EQ band. First, any gain is applied to the frequency band before the signal is routed through the clipping algorithm. When the signal exits the clipping algorithm, the same amount of gain is subtracted from the output. This results in a 0 dB gain. Although ClipShifter does not have a true SideChain processing path (like some compressors or noise gates), the SideChain option mimics this effect.

If a gain of +3 dB is selected for the low frequency, the following occurs: First, the +3 dB is applied to the low frequency. Then the signal is processed through the clipping algorithm. Finally, -3 dB of gain is applied to the output signal. Regardless of the setting on the gain control (i.e., either positive or negative gain), the gain is applied before clipping, and the inverse gain is applied after clipping.

Please note: Although the result of the SideChain gain should be 0 dB and not adversely impact to frequency balance of the output, severe clipping will affect this. Severe clipping of a particular frequency band will have an overall lowering effect on the output of that specific frequency band.

M/S CONTROLS [PAID FEATURE ONLY]

The Mid/Side controls are accessible by clicking the M/S button. The controls are similar to the Multiband Frequency controls. They enable ClipShifter to process either the Mid or Side component of the audio through the clipping algorithm. By default, ClipShifter processes the audio as independent Left and Right signals.



M/S Mode button: The M/S Mode button toggles settings between Left/Right stereo processing, and Mid/Side processing. When the button is disengaged, the controls are hidden since they are not applicable.

Please note: When the M/S Mode button is engaged, the input meters change to display Mid and Side input instead of Left and Right. The M indicates that the meter is displaying the Mid component of the audio. The S is for Side. In most circumstances, it is usual for the Mid signal to be considerably louder than the Side audio.

Process button: The Process buttons determine if the Mid and/or Side bands are passed through the clipping algorithm. Engaging the button enables clipping. In M/S Mode, ClipShifter responds slightly differently when clipping the signal. Signals may appear to go louder than the clipping threshold before clipping occurs. This is due to the method used to split the mid and side signals. In order to avoid altering the final stereo balance when the signals are converted to left and right at the output, the mid signal will be +6 dB louder. The side signal will conversely be -6 dB quieter. The overall outcome is that the output signal will behave as intended, but the clipping thresholds and output gain levels will need to be monitored in order to avoid signal levels over 0 dBFS.

Gain: The Gain knob is used when the Process button is engaged. The gain is applied prior to the clipping algorithm. This can be useful when the signal needs to be increased in order to get the desired clipping amount. The default setting is -0 dB.

The Gain knob functions like a sidechain control in that any gain that is applied prior to the clipping algorithm is subtracted after the signal is processed. The result is that the gain can be increase to get the desired clipping amount without drastically altering the stereo width/balance at the output. In particular, processing the Side band may need substantial gain in order to produce clipping.

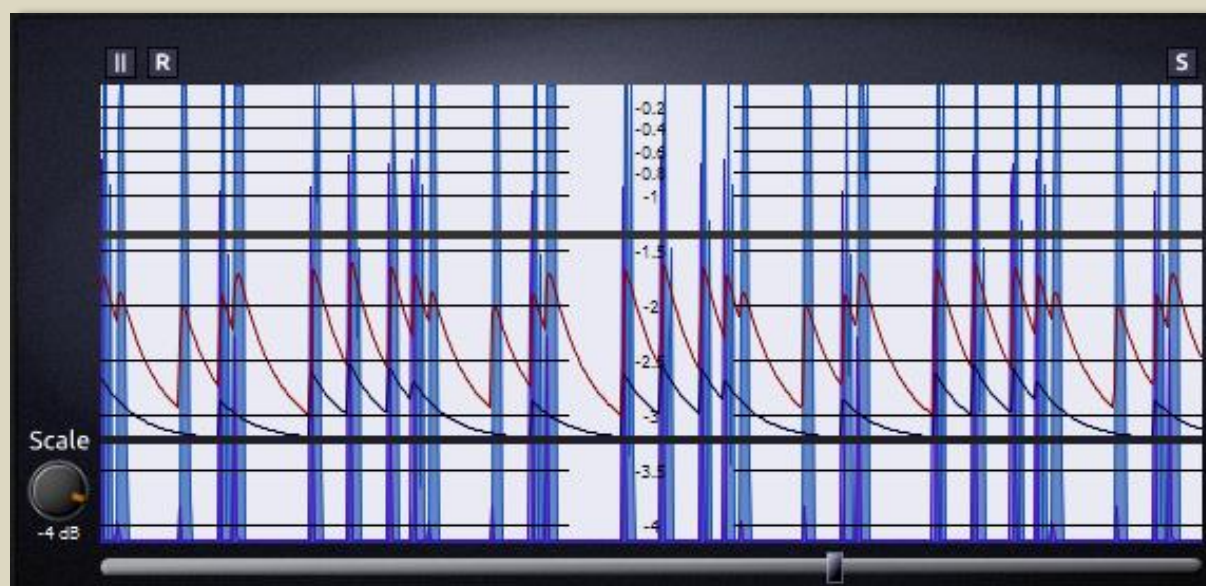
Solo: When the Solo button is enabled, only the selected stereo/width signal is heard at the output. The other signal (i.e. Mid or Side) is muted.

Width: The Width control is used to alter the spread of the stereo signal. It is possible to use the control in L/R Mode, or in M/S Mode. The default setting of 100% does not boost or cut

the Mid or Side signal. Decreasing the value will decrease the amount of Side audio in the output. The minimum value of 0% will make the output signal all Mid (i.e., Mono). Increasing the value above 100% will increase the amount of Side in the output. This results in an output signal that has more width due to an increased amount of Side signals. In addition, this will also increase the output volume.

Please note: It may be useful to use a Stereo Scope plugin after ClipShifter to ensure that the stereo signal is not too wide. Extremely wide signals may have significant phase issues and incompatibility when played on mono devices.

WAVEFORM HISTORY



The Waveform History displays information about the peak input, peak output, dynamic clipping thresholds, and clipping reduction. By default, the output meters are displayed in a purple-blue color, and the input levels are displayed in a lighter blue color. These colors match the colors displayed in the VU meters. The dynamic clipping thresholds are displayed as two solid lines. In addition, the amount of clipping reduction can be displayed. This is not displayed by default, but can be enabled by clicking the Settings button.



Display Time: The default setting for the waveform history is to display 10 seconds worth of audio, and to show the entire volume level (i.e. from infinity to 0dBFS). The horizontal and vertical sliders can be used to adjust these settings.


Sliding the horizontal slider (located at the bottom of the waveform history display) adjusts the amount of time that is displayed. The minimum setting is 0.1 seconds, and the maximum time is 20 seconds.

Scale Control: ClipShifter displays information on a decibel scale, with the maximum of the VUs and waveform view equating to 0dbFS. The minimum value of the VUs and waveform view are controlled by Scale Control. Turning the knob will change the lowest setting (i.e., the bottom of the display).

Please note: changing the zoom control on quieter audio signals can have the effect of hiding the input, output, or clipping threshold.

Initial and End Threshold Adjustment: Both the Initial and End Threshold values are displayed on the waveform history view as dark horizontal lines. The actual clipping thresholds will vary between these two lines. Although the thresholds can be adjusted by the corresponding knobs, they can also be adjusted within the waveform history view. Clicking and dragging on either of the lines will enable the Initial or End threshold to be adjusted by the mouse.

Pause and Reset Buttons: The waveform history view can be temporarily paused to view the audio signals. The button and the top-left side ( button) pauses and un-pauses the display. This does not affect the audio that is processed through the plugin. Additionally, the vertical volume adjustment slider can be used while the waveform history view is paused. The Reset button ( button) next to the Pause button clears out the current waveform display.

Display Setting: Clicking the Settings button ( button) displays an additional dialog box for adjusting the meters and waveform history view. Clicking the Settings button a second time closes the dialog box, although the settings are still applied. The color knobs change the hue. Changing any of the colors will also alter the colors within the VU meters. Both the Input and Output colors are semitransparent, so the colors will interact with one another.

The Hide/Show buttons turn on or off the corresponding display within the waveform history view. The default setting is for the Input, Threshold, and Output to be displayed simultaneously while the Reduce is not displayed; however, one or more settings can be turned on/off.



The Smooth control alters the decay settings on the waveform view only (this does not affect the attack/decay timing of the VU meters). Depending on the amount of time displayed in the waveform history view, this can be used to view peak information on very dynamic audio. Increasing the Smooth control will increase the amount of time it takes the signal to decay

within the waveform view. The default setting of 1ms for the Input and Output effectively make the decay instantaneous. The 100ms setting on the Reduce control corresponds to a fast VU meter setting. This makes it easier to view the amount of peak reduction/clipping.

Features of the Paid Version of ClipShifter

The paid version of ClipShifter adds additional features indicated throughout this manual. Although the free version of ClipShifter is a unique clipping plugin, the paid version adds more tools that enhance the usefulness of ClipShifter. This includes Oversampling, Double Processing, EQ controls with multi-band clipping of separate frequencies, and Mid/Side processing. For information regarding purchasing ClipShifter, please refer to the LVC-Audio website (<http://lvcaudio.com>).

Presets and Uses

USAGE

ClipShifter contains a few basic presets; however, experimentation is a necessity. Each audio signal will be different. Using the meters, waveform history view, and or course ears, is required to adjust the controls in order to produce the desired sound. Input Gain, in conjunction with the Initial and End Thresholds, is critical in obtaining a good sound.

Since ClipShifter can change the threshold of clipping dynamically, interesting results can be produced. Typical usage can involve setting the Initial Threshold to a lower setting than the Ending Threshold. The result is that the first transient signal that is above the Initial Threshold will be clipped, but additional audio that is above the threshold will contain fewer amounts of clipping. This is significantly impacted by both the attack and release time. By using the waveform history view, the dynamic nature of the clipping threshold can easily be visualized and subsequently adjusted.

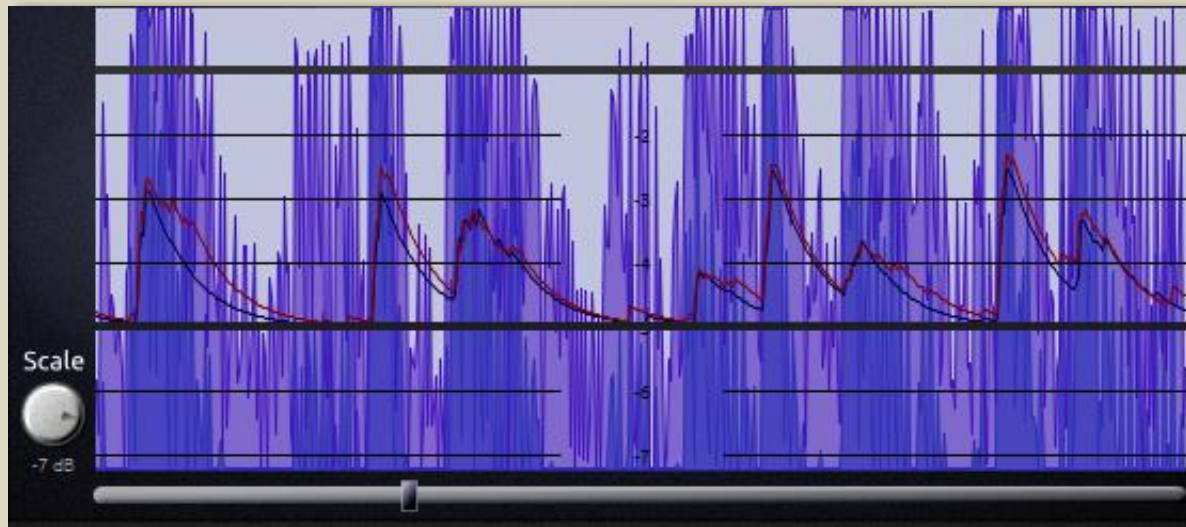


Figure 1: Decreasing Distortion-Initial Threshold at -5dB, Ending Threshold at -1dB

Conversely, clipping the secondary transients more than the initial transient can occur by reversing the Initial and Ending Thresholds. Using a higher Initial Threshold (e.g., -3 dB), lower End Threshold (-5 dB) results in less saturation for the initial transient, but increasing levels of saturation for audio above the threshold.

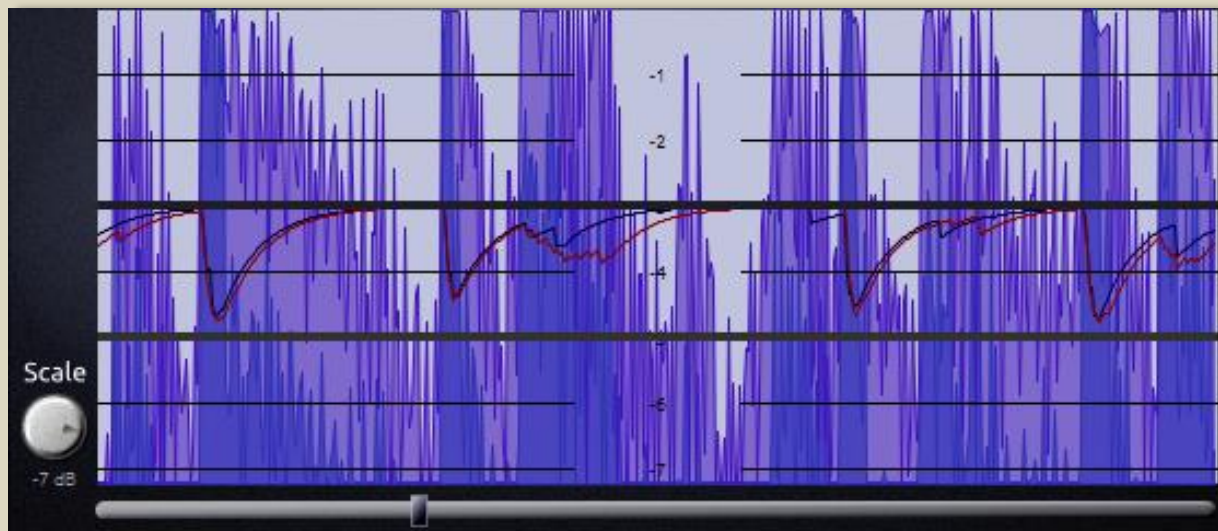


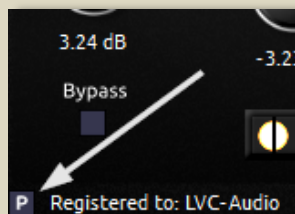
Figure 2: Increasing Distortion-Initial Threshold at -3dB, Ending Threshold at -5dB

PRESET DEFAULTS & FORMAT

ClipShifter can save and load presets using the standard format for VST, VST3, RTAS, AAX, and AU. There are 20 slots for user presets. Saving and loading these presets is controlled by the audio host program.

Several default presets have been configured for ClipShifter. These include a variety of settings for drums, master buss, vocals, and bass. Please keep in mind that the overall sound of ClipShifter is highly dependent on the input level of the audio signal in relationship to the Initial and Ending Thresholds. Adjusting the input and output gain will be a necessity for any preset.

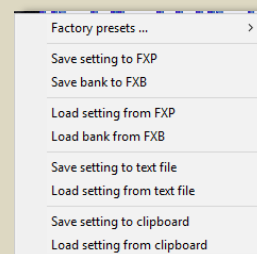
Certain presets are marked with “FREQ” (e.g. “Master1 – FREQ”). These presets use oversampling and/or the multiband frequency control. These presets will load within the free version of ClipShifter without any problem; however, the oversampling or frequency controls will remain bypassed.



LVC-AUDIO PRESET MENU

Although all audio hosts provide a way to store and recall presets, these methods are different depending on the host and plugin format. The LVC-Audio Preset Menu is a standardized way for loading factory presets, importing presets, and exporting presets.

To access the Preset Menu, click the “P” button in the lower-left corner of the plugin. The Preset Menu provides several options for loading, exporting, and importing presets.



Factory Presets: The first menu item listed is factory presets. This includes several factory presets for ClipShifter. Selecting any of the presets will automatically load the settings.

Saving and Loading FXP Presets: FXP presets are a standard format for VST plugins; however, they can be used for any other plugin format (i.e., AU, VST3, RTAS, and AAX). The FXP format saves the settings of the plugin into a file with the FXP extension. This file can be used to recall a certain preset in the same DAW, in another DAW, and/or with a different plugin format (e.g., VST to AU).

To save a FXP file, click “Save setting to FXP.” A file prompt will open that allows naming of the FXP file, and selecting where the file is saved. To recall a preset, click “Load setting from FXP.” Navigate and select the appropriate FXP file to recall the saved preset.

Saving and Loading banks (FXB): In the VST format, ClipShifter has 20 slots for user presets. Each of these preset slots can be modified and recalled from within the DAW. Additionally, the entire bank of 20 presets can be saved and reloaded. To save a bank of presets, choose "Save bank to FXB" from the preset menu. Conversely, to load a bank of presets from an FXB file, choose "Load bank from FXB."

Please note: The factory preset banks are typically only included within the VST format. Therefore, saving and loading from FXB may not be useful with different plugin formats.

Saving and Loading with Text Files: As a means to standardize compatibility across plugin formats, ClipShifter can save and load a preset using a plain text file. The individual settings are stored in the text file, which also makes it easy to share presets. To save the plugin's current settings, click on "Save setting to text file." A file prompt will open that allows naming of the text file, and choosing the file's location. To load a preset from a text file, click "Load setting from text file" and select the appropriate file.

When settings are saved as text files or to the clipboard (see below), they look like this:

```
ClipShifter_MakePresetFromNamedParams("preset",47, kInGain, 0.000000, kOutGain, 0.000000, kThreshStart, 0.000000, kThreshStop, 0.000000, kClipShape, 1.000000, kHarm, 1.000000, kThreshTime, 100.000000, kReleaseTime, 1000.000000, kLink, false, kBypass, false, kFadeHorzHx, 10.000000, kMeterScale, -24.000000, kOver, 0, kDouble, false, kThreshLink, 2, kFilterLow, 20.000000, kFilterHigh, 20000.000000, kGainSelect, 1, kLowSolo, false, kMidSolo, false, kHiSolo, false, kLowGain, 0.000000, kMidGain, 0.000000, kHighGain, 0.000000, kmsMode, false, kMGain, 0.000000, kSGain, 0.000000, kMProc, false, kSProc, false, kMSolo, false, kSSolo, false, kStereoWidth, 100.000000, kInColor, 80, kOutColor, 190, kClipColor, 255, kThreshColor, 1, kInSmooth, 1.000000, kOutSmooth, 1.000000, kClipSmooth, 1.000000, kInBypass, true, kThreshBypass, true, kOutBypass, true, kClipBypass, false, kMix, 100.000000, kLowProcess, false, kMidProcess, false, kHighProcess, false);
```

The text involves a series of parameters and values separated by commas. Of notable importance is the first few characters of the text string that involve the name of the plugin. If the name of the plugin does not appear in the exact format (e.g., ClipShifter_xxxxxxx), then the plugin will not load correctly. When loading a preset from the Clipboard (i.e., from an email, forum post, etc.), it is important to select and copy all of the text in order for the preset to load.

Saving and Loading with the Clipboard: Similarly to saving and loading from a text file, presets can be saved directly to the clipboard. This allows for easy sharing by pasting into an email, forum post, etc. Clicking "Save setting to clipboard" will copy the current plugin's settings into the clipboard. Once a preset is copied into the clipboard (e.g., from the internet or email), clicking "Load setting from clipboard" will load the preset into ClipShifter. **Saving**

and loading to the clipboard uses the same exact text format as saving and loading to a text file. Therefore, text can be copied from within a previously saved preset text file and loaded with the clipboard loading function.