

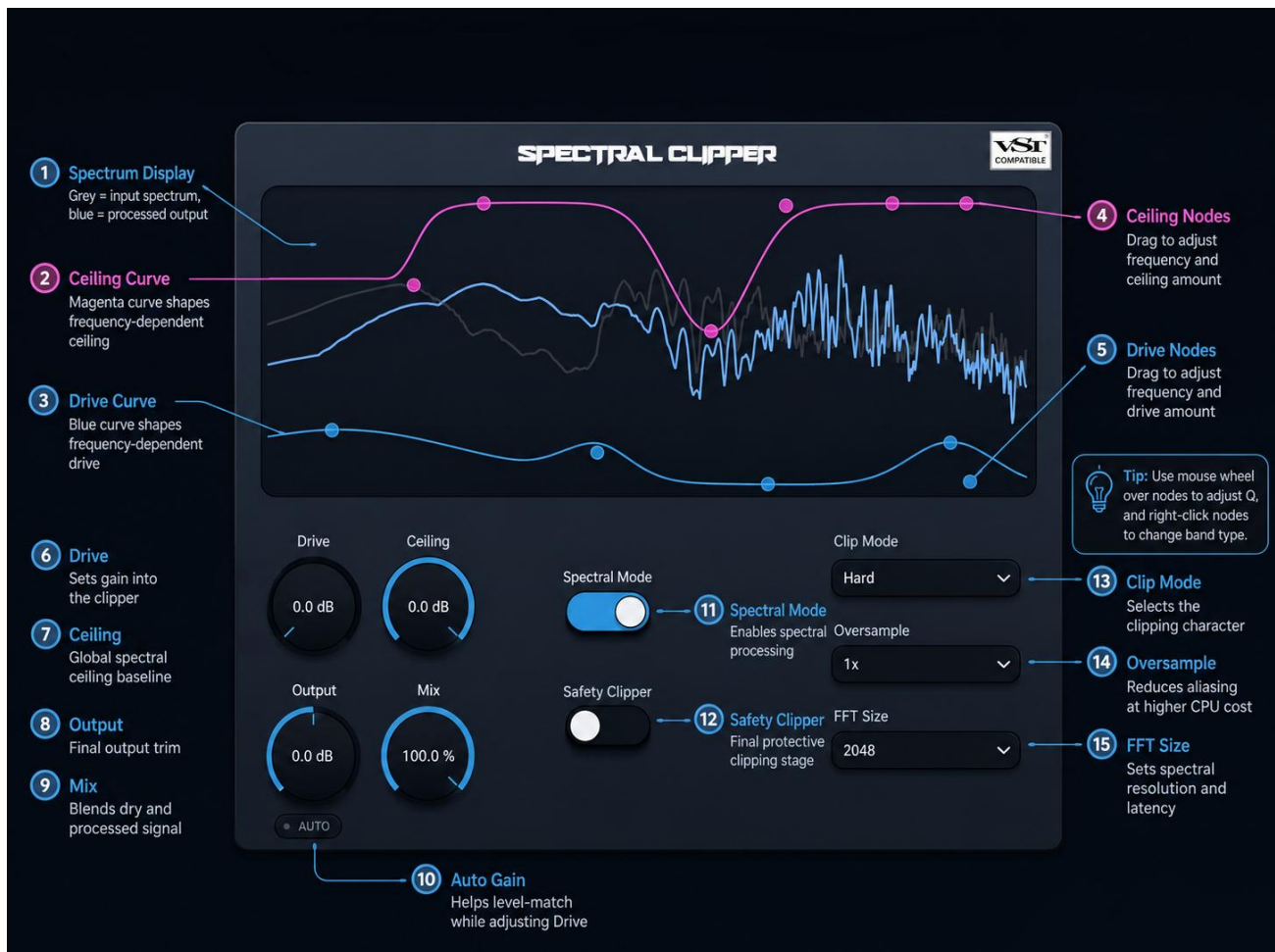
Spectral Clipper – User Manual

Introduction

Spectral Clipper is a hybrid audio processor that combines a high quality time-domain clipper with a frequency dependent spectral shaping engine.

The plugin can be used as a conventional clipper, but Spectral Mode also allows you to control how strongly different frequency areas are driven into the clipping stage. This makes it possible to preserve important transients, control harsh frequency regions and increase perceived loudness with more precision than a conventional broadband clipper.

This manual explains every control, the signal flow and the underlying processing in practical terms. It is intended for producers, mixing engineers and mastering engineers who want both immediate results and deeper technical control.



1. Overview

Spectral Clipper contains two main processing paths.

Time-Domain Mode

When Spectral Mode is disabled, the complete signal is sent directly through the selected clipping algorithm.

This mode provides:

- zero reported spectral processing latency;
- straightforward broadband clipping;
- low CPU usage;
- optional 2× or 4× oversampling;
- multiple clipping characteristics.

Spectral Mode

When Spectral Mode is enabled, the signal is divided into frequency components using a Short-Time Fourier Transform.

The Drive and Ceiling curves determine how individual frequency areas are treated before and after clipping.

Spectral Mode can help you:

- push selected frequency regions harder into the clipper;
- reduce clipping pressure in sensitive frequency areas;
- preserve low-end definition;
- control harshness in the midrange or high frequencies;
- create a more balanced clipping response;

The main controls are:

- Drive
- Ceiling
- Output
- Mix
- Auto Gain
- Spectral Mode
- Safety Clipper
- Clip Mode

- Oversample
 - FFT Size
 - Drive nodes
 - Ceiling nodes
-

2. Signal Flow

Time-Domain Mode

Input

- Drive
- Selected Clipping Mode
- Dry/Wet Mix
- Auto Gain
- Output Gain
- Safety Clipper, when enabled
- Host

Spectral Mode

Input

- STFT Analysis
- Spectral Drive and Ceiling Shaping
- Pre-emphasis
- Selected Clipping Mode
- De-emphasis
- STFT Synthesis
- Dry/Wet Mix
- Auto Gain
- Output Gain
- Safety Clipper, when enabled
- Host

The exact internal order may include additional gain compensation and safety processing, but this diagram represents the intended user workflow.

3. Clipping Modes

The Clip Mode menu selects the waveshaping algorithm used by the clipping stage.

Each mode creates a different harmonic structure and transient response.

Hard

Hard clipping immediately limits samples that exceed the clipping threshold.

Characteristics:

- aggressive;
- direct;
- strong harmonic generation;
- retains a sharp and controlled transient character;
- can create more audible aliasing without oversampling.

Soft

Soft uses a smooth, tanh-based saturation curve.

Characteristics:

- rounded transition into clipping;
- smoother than Hard mode;
- less aggressive transient flattening;
- warm and controlled;
- suitable for moderate amounts of drive.

Soft Pro

Soft Pro uses an arctangent-based clipping curve.

Characteristics:

- smooth clipping knee;
- slightly firmer and more direct than Soft;
- retains punch while controlling peaks;
- balanced harmonic response.

Sine

Sine mode uses a sine-shaped transfer curve.

Characteristics:

- smooth and rounded saturation;
- slightly different harmonic character from Soft and Soft Pro;

- controlled peak compression;
- can sound dense and musical at moderate settings.

Tube

Tube mode applies soft, asymmetric saturation.

Characteristics:

- introduces even-order harmonic content;
- warmer and less symmetrical than the other soft modes;
- can add perceived body and thickness;
- includes internal DC-blocking for stability.

Very high Drive settings can make Tube mode more coloured than the other clipping modes.

Tape

Tape mode is inspired by the rounded and slightly asymmetric behaviour of magnetic tape saturation.

Characteristics:

- soft transient rounding;
- subtle asymmetry;
- dense but controlled harmonics;
- less abrupt than Hard clipping;
- can make bright material feel smoother.

Tape mode is not intended to model a complete tape machine. It provides a tape-inspired saturation curve within the Spectral Clipper engine.

Foldback

Foldback mode folds peaks back toward the centre when they exceed the clipping threshold.

Characteristics:

- aggressive;
- nonlinear;
- creates complex upper harmonics;
- can become metallic or distorted quickly;
- intended primarily as a creative effect.

Foldback can create strong aliasing. Using 2× or 4× oversampling is highly recommended.

4. Main Controls

Drive

Range: 0 to +24 dB

Drive controls the amount of gain applied before the clipping stage.

Increasing Drive:

- pushes the signal harder into the clipper;
- increases harmonic content;
- reduces peak range;
- can increase perceived loudness;
- makes the character of the selected clipping mode more obvious.

In Spectral Mode, the global Drive setting is combined with the blue Drive curve.

Ceiling

Range: -48 to 0 dB

Ceiling sets the global baseline for the spectral Ceiling curve.

In Time-Domain Mode, the main clipping behaviour is primarily determined by Drive and the selected clipping mode.

In Spectral Mode, Ceiling determines the base level from which the magenta Ceiling nodes shape individual frequency regions.

Lower Ceiling settings generally cause more aggressive frequency-dependent clipping or spectral control.

Output

Range: -24 to +24 dB

Output applies gain after the main processing.

Use Output to:

- compensate for loudness changes;
- avoid overloading the next plugin;
- perform manual level matching;
- set the desired final peak level.

When Auto Gain is enabled, Output remains available as a final manual trim.

Mix

Range: 0 to 100%

Mix controls the balance between the unprocessed and processed signals.

- 0% = fully dry
- 100% = fully processed

In Spectral Mode, Mix also gradually scales the spectral pre-emphasis, de-emphasis and Drive shaping.

At 0% Mix, the spectral shaping is effectively bypassed.

At 100% Mix, the complete spectral processing is applied.

Intermediate Mix settings can be useful for parallel clipping, especially on drums, buses and transient-heavy material.

5. Auto Gain

Auto Gain automatically compensates for level changes introduced by clipping and Drive.

When enabled, the plugin compares the level of the processed signal with the input signal and applies gain compensation to keep the perceived output level closer to the original input level.

Auto Gain is useful for:

- comparing clipping modes fairly;
- preventing louder settings from automatically sounding better;
- evaluating distortion instead of volume;
- reducing the need for constant Output adjustments;
- maintaining a more consistent signal level while changing Drive.

Important Behaviour

Auto Gain is designed as a practical level-matching tool. It is not a loudness-normalisation system and does not guarantee an exact LUFS match.

Its response is based on the signal level measured by the plugin and may react differently depending on:

- transient density;
- bass content;
- signal dynamics;
- clipping amount;
- Spectral Mode settings;
- Mix position.

For mastering decisions, it is still recommended to verify the result with a loudness or true-peak meter.

6. Engine Controls

Clip Mode

Selects the clipping algorithm.

Available modes:

- Hard
- Soft
- Soft Pro
- Sine
- Tube
- Tape
- Foldback

Refer to Section 3 for detailed descriptions.

Oversample

Available settings:

- 1×
- 2×
- 4×

Oversampling runs the clipping stage at a higher internal sample rate.

This reduces aliasing caused by the harmonics generated during clipping.

1×

- lowest CPU usage;
- most aliasing;
- suitable for light processing or sound-design situations where aliasing is acceptable.

2×

- useful balance between sound quality and CPU usage;
- recommended as a general-purpose setting.

4×

- strongest aliasing reduction;
- highest CPU usage;
- recommended for aggressive clipping, mastering or Foldback mode.

Oversampling does not remove all aliasing, but it can significantly reduce unwanted folding around the clipping stage.

Depending on the plugin version and host, oversampling may not change the reported plugin latency.

FFT Size

Available settings:

- 512
- 1024
- 2048
- 4096

FFT Size only affects Spectral Mode.

Smaller FFT sizes

Advantages:

- lower latency;
- lower CPU usage;
- faster transient response.

Disadvantages:

- lower frequency resolution;
- broader spectral shaping;
- less precise separation between nearby frequencies.

Larger FFT sizes

Advantages:

- higher frequency resolution;
- more precise node behaviour;
- smoother treatment of narrow frequency regions.

Disadvantages:

- higher latency;
- higher CPU usage;
- potentially softer transient localisation.

A setting of 1024 or 2048 is recommended for most material.

Spectral Mode

Enables or disables the spectral processing engine.

When disabled:

- the plugin acts as a conventional broadband clipper;
- the spectral node curves are not applied;
- the plugin uses the time-domain path.

When enabled:

- the Drive and Ceiling curves become active;
- the signal is analysed and resynthesised using an STFT process;
- FFT Size affects resolution and latency.

Safety Clipper

The Safety Clipper applies a final hard clamp to the output signal.

It is intended to catch samples that exceed the digital range after processing.

Use it to:

- prevent sample values above 0 dBFS;
- catch peaks created by Output gain;
- provide an additional final protection stage.

The Safety Clipper clamps digital samples to the valid range, but it does not guarantee that the signal will remain below 0 dBTP after digital-to-analogue reconstruction.

For mastering and distribution, always check the final output with a dedicated true-peak meter.

7. Spectral Graph

The large graph displays both spectral information and the frequency-dependent processing curves.

Spectrum Display

- Grey: input spectrum
- Blue: processed output spectrum

The spectrum display provides visual feedback but should not replace critical listening.

Drive Curve

The blue curve shows the frequency-dependent Drive amount.

Blue nodes determine which frequency regions are pushed harder into the clipper.

Ceiling Curve

The magenta curve shows the frequency-dependent Ceiling response.

Magenta nodes determine how the spectral clipping target changes across the frequency spectrum.

8. Spectral Nodes

There are two node groups.

Drive Nodes

Drive nodes are displayed in blue.

Each Drive node contains:

- Frequency
- Gain
- Q
- Band Type

Drive-node Gain ranges from 0 to +24 dB.

Increasing a Drive node pushes that frequency area harder into the clipper.

Ceiling Nodes

Ceiling nodes are displayed in magenta.

Each Ceiling node contains:

- Frequency
- Ceiling level
- Q
- Band Type

Ceiling values range from -48 to 0 dB.

9. Band Types

Each node can use one of four shapes.

Bell

A frequency-centred bell shape.

Q determines the width of the affected area.

- low Q = wide frequency range;

- high Q = narrow frequency range.

Recommended for targeted frequency control.

Low Shelf

Affects frequencies below the selected node frequency.

Q controls the transition around the shelf frequency.

Recommended for:

- low-end control;
- bass drive;
- protecting or emphasising sub frequencies.

High Shelf

Affects frequencies above the selected node frequency.

Q controls the transition around the shelf frequency.

Recommended for:

- high-frequency smoothing;
- increasing high-frequency drive;
- controlling brightness and harshness.

Flat Tilt

Creates a broadband tilt around the selected node frequency.

The node frequency acts as the pivot point.

Q determines the direction and intensity of the tilt.

Recommended for:

- broad tonal balance changes;
- changing the relative clipping pressure between low and high frequencies;
- creating gradual spectral emphasis.

10. Mouse Controls

Moving a Node

Drag a node horizontally to adjust its frequency.

Changing Gain or Ceiling

Drag a node vertically.

For blue Drive nodes:

- upward increases Drive;
- downward decreases Drive.

For magenta Ceiling nodes:

- upward raises the Ceiling;
- downward lowers the Ceiling.

Changing Q

Place the mouse pointer over or near a node and use the mouse wheel.

- higher Q = narrower or steeper response;
- lower Q = wider or smoother response.

Changing Band Type

Right-click a node to open the Band Type menu.

Available types:

- Bell
- Low Shelf
- Flat Tilt
- High Shelf

11. Latency

Spectral Mode introduces latency because the plugin must analyse, process and resynthesise blocks of audio.

The exact reported latency depends on the selected FFT Size and the current plugin implementation.

With an FFT size of N and a hop size of N/4, the effective processing latency is approximately related to:

$1.75 \times \text{FFT size in samples}$

The actual host-reported latency may vary slightly depending on the overlap-add implementation, buffer handling and plugin version.

Time-Domain Mode does not require the STFT processing delay.

12. Host Automation

All visible plugin parameters can be automated from a compatible host.

This includes:

- Drive
 - Ceiling
 - Output
 - Mix
 - node frequency;
 - node Q;
 - node Drive or Ceiling value;
-

13. Activation

The full version of Spectral Clipper requires activation.

Activation Procedure

1. Open Spectral Clipper in your DAW.
2. Enter the license key provided with your purchase.
3. Press click Activate.
4. Ensure that the computer has an active internet connection.
5. Wait for the activation confirmation.

After successful activation, the activation information is stored locally on the computer.

An internet connection is normally only required for the initial activation, unless online revalidation is required by a future version.

License-Key Entry

License keys are case-sensitive.

Enter or paste the license key exactly as provided, including:

- lowercase letters;
- uppercase letters;
- numbers;
- hyphens.

Do not manually change the capitalisation of the license key.

14. Troubleshooting

The Plugin Does Not Activate

Check that:

- the license key was entered exactly as provided;
- lowercase and uppercase characters were preserved;
- there are no spaces before or after the key;
- the computer has internet access;
- a firewall is not blocking the DAW;
- the correct product license is being used.
- the maximum number of activations has been exceeded

CPU Usage Is High

Try:

- reducing Oversample from 4× to 2×;
- reducing FFT Size;
- disabling Spectral Mode;
- closing unnecessary plugin interfaces;
- increasing the DAW audio buffer size;
- using the latest plugin version.

Spectral Mode, large FFT sizes and 4× oversampling require more CPU than basic Time-Domain Mode.

The Plugin Introduces Latency

Disable Spectral Mode for recording or live monitoring.

Alternatively, select a smaller FFT Size.

15. Licensing Terms

Spectral Clipper is copyrighted software owned by Erato Studio.

By purchasing or activating Spectral Clipper, you receive a limited, non-exclusive and non-transferable license to use the software for personal and commercial music-production purposes.

You may use audio processed with Spectral Clipper in commercial releases, client work, performances and other music-production projects.

You may not:

- distribute or share the plugin files;
- resell the plugin or license key;
- include the plugin in another software or plugin bundle;

- publish or distribute modified versions of the plugin;
- reverse engineer, decompile or circumvent the activation system, except where such restrictions are prohibited by applicable law;
- claim ownership or authorship of the plugin.

Your license may be suspended or revoked when the software, license key or activation system is deliberately abused or redistributed.

These terms do not affect any mandatory rights granted under applicable consumer law.

16. Customer Support

For questions, recommendations, activation problems or technical support, contact:

info@eratostudio.com

When reporting a problem, please include:

- your operating system;
- DAW name and version;
- plugin format;
- sample rate;
- audio buffer size;
- a description of the issue;
- steps needed to reproduce the problem.

Do not send your complete license key in public messages or public support forums.

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