

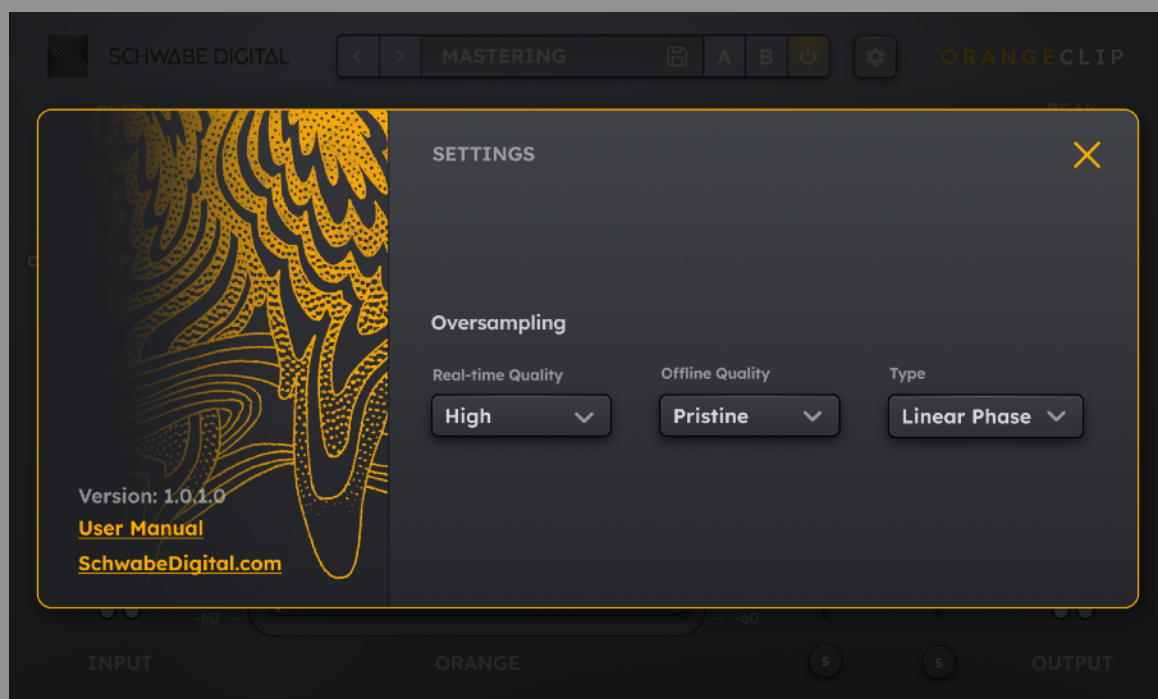
# ORANGE CLIP



Philadelphia, PA

OPERATIONS MANUAL V1.0.6

February, 2024





# WHAT IS **ORANGE CLIP**?

**ORANGE CLIP** is inspired by the unique stock clipper found in one of the most legendary digital audio workstations for modern music production. The clipper itself is simple, but it has a bold and unique sound that you have heard in many modern productions. It inflates low frequencies, crunches highs, and smooths the mid-range in a relaxed and pleasing way. We re-engineered that legendary soft clipping sound and added a gang of features to meet the needs of modern music producers & mixing engineers.

In the past, when I tried to mix records stemmed out from that infamous DAW, I struggled to get that unique overloaded tone I referenced from the production mix. While I could get the mix close, I could never capture the exact crunch, energy, roundness and smear that was present in the production mix. There was something elusive and magical about the tone that I was missing. To be honest, it frustrated me because artists grew attached to the sound of those production mixes. I tried every tool on the market to recreate it, but it was never quite right. From that frustration comes **ORANGE CLIP**.

Orange Clip is a faithful recreation of that infamous sound. We carefully modeled the clipping, wave shaping, overload, dynamic and harmonic effects of that famed sound. Mathematically, it is identical. However, in addition to mathematically matching that famed sound, we also added some features that we think make Orange Clip eclipse the tool it was inspired by. And we also made it available in every DAW (AU, VST3, and AAX).

**Are we crazy for spending an endless amount of time researching and emulating a stock DAW plugin that is more than 25 years old?**

Yes

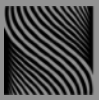
**Did we do it anyhow?**

Yes

**Did we add a bunch of modern features?**

Yes

**Welcome to **ORANGE CLIP****




# USING ORANGE CLIP

**ORANGE CLIP** is a simple tool that might not even need a manual. There is essentially one knob that affects the sound, **ORANGE**. And it is right there in the center of the plugin.



The dB value displayed in the **ORANGE** knob indicates the knee's shape or size. The default is a **Medium** knee clipper with a value of -4.4 dB. If you turn it counter-clockwise to -51.8dB it is a **Soft** knee clipper. And if you turn it clockwise to 0.0dB it is a **Hard** knee clipper.

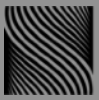
You will also need to gain the signal into the clipper (or wave shaper). Similar to Gold Clip, we created two ways for you to do this while maintaining perceived volume.

The first way is by linking the input and output trims. Simply click the  symbol above the transfer function.



Adjust the Input Trim to achieve the desired amount of clipping on the **CLIP** indicator above the input meter. Ideally, a range of 0 to +3 dB is recommended.





Additionally, you can use the **Clip Ceiling** to set the desired amount of clipping. The white Clip Ceiling bar floats over the input meter and looks like this...



Adjust the Clip Ceiling by lowering it over the input meter until the input signal exceeds the white ceiling line. Again the amount of clipping is shown in the **CLIP** display above the input meter. If the **CLIP** display is negative, keep dragging the ceiling down until you get the desired amount.



Clipping occurs throughout that infamous DAW. It clips in the sampler, on tracks, and on the mix bus; everything might be clipping or overloading, and that is what makes it sound so unique.

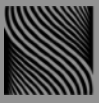
With Orange Clip you can recreate that famous blown-out and overloaded sound in any DAW. Based on my experiments, all of the different places that DAW overloads use some variation of Orange Clip's clipping and wave shaping. We spent countless hours iterating until we found the exact mathematical equations that make up the sound of Orange Clip. It is everything you need to get that legendary sound, plus a lot more. Orange Clip design is simple, clean, and robust, and it has been on every one of my mixes since I got the first alpha version. I think you will love it as much as I do.

Be well,

Ryan Schwabe

Founder, Schwabe Digital

2x Grammy Nominated, platinum certified mixing and mastering engineer



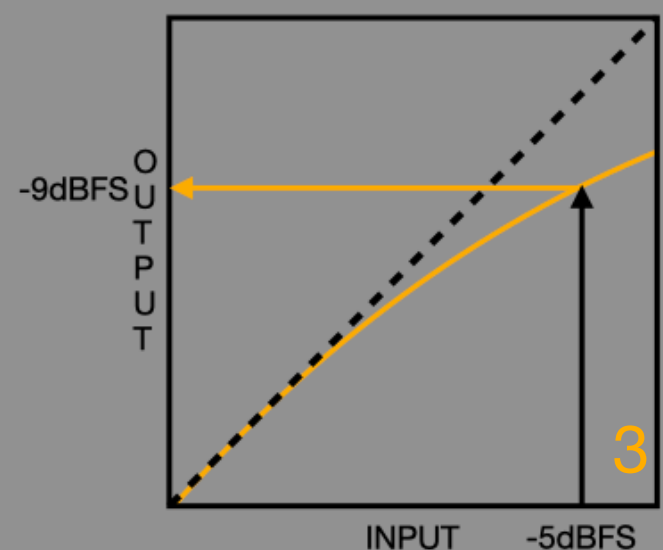
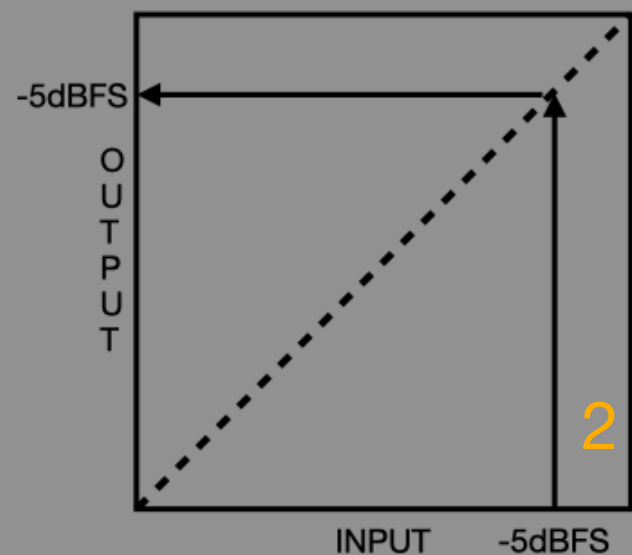
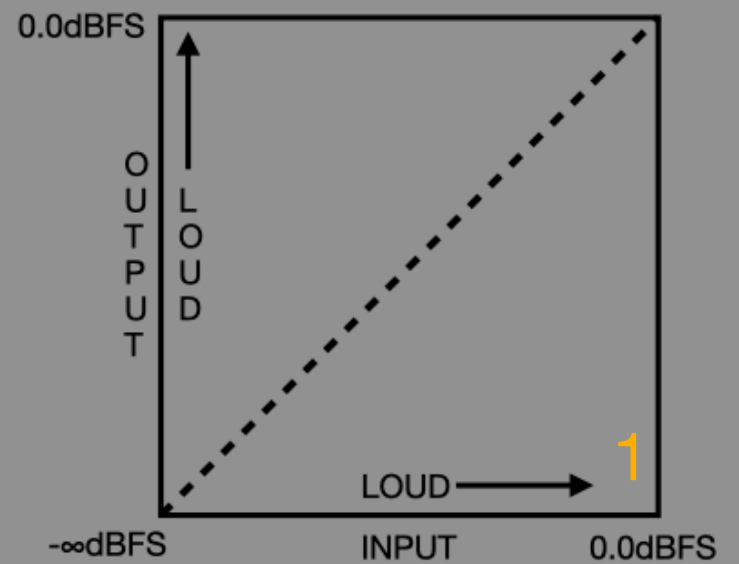
# TRANSFER FUNCTIONS

Before you can understand what a wave shaper is, it is important to understand how to read a transfer function. A transfer function is a simple way to display the input signal and output signal of a non-linear process.

The first image on the right (1) shows a linear relationship between input and output. The X-axis shows the input, or source, the Y-axis shows the output, or destination. The dotted line shows the linear relationship between input and output.

As you can see in the second image (2), an input signal of -5dBFS produces an output signal of -5dBFS. The arrow shows the signal going into the processor from the bottom and out of the processor to the left. There is no change to the signal - it is a linear process. -5dBFS input = -5dBFS output.

Image (3) shows a non-linear process. The output signal is slowly reduced as the input signal increases. In this example, an input signal of -5dBFS has an output of -9dBFS. The arc of the gain change from input to output is what defines the wave shaper's sound and it's what took us so long to get right about Orange Clip. Changing the amplitude of a signal like this is by definition, distortion. By changing the shape of the waveform, we are not only changing the peaks but also adding harmonics and augmenting the tone of the signal.



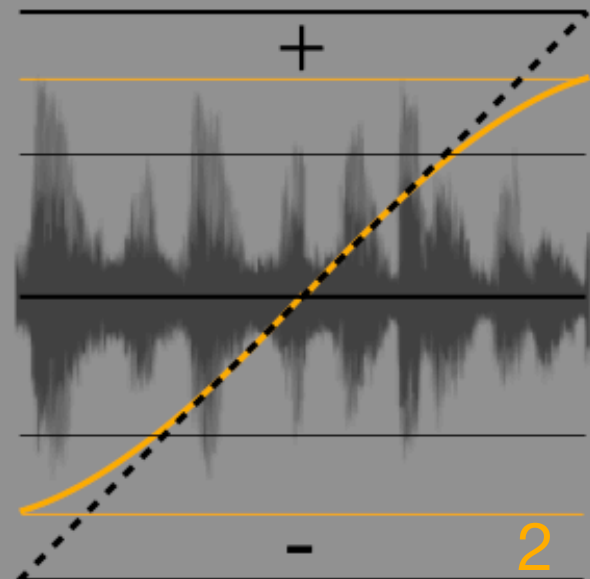


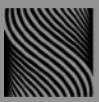


# WHAT IS A WAVE SHAPER?

A wave shaper is a clipper, and a clipper is a wave shaper. They are essentially the same thing. It is an audio effect that changes the signal by applying a mathematical shaping function. What? In my mind, a more appropriate term would be amplitude shaper, but nobody says that. A wave shaper changes the amplitude of the peaks instantaneously with a mathematical equation.

When a traditional transfer function is used as a display for a processor, such as on Orange Clip (1) it is assumed that the wave shaping is symmetric; meaning it is affecting the positive and negative side of the waveform in the same way. Not all wave shapers are symmetric, but Orange Clip is. When we look at a waveform in a DAW (2) we see both the positive and negative side of the waveform. A traditional transfer function only shows one side of the waveform. If we were to show both sides of the waveform, the wave shaper display would look like the orange line on image 2. The dotted line represents the input and the orange line represents the wave shaped output. For image (3) I super imposed Orange Clip's transfer function over the positive and negative side of a waveform to emphasize the concept.





# ORANGE



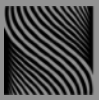
The ORANGE setting determines the size and shape of the wave shaping applied to the track. You can consider it a threshold on a compressor. It is the level at which the signal starts to wave shape or compress. It is the length of the wave shaping down from the ceiling setting. The ORANGE setting goes from 0.0 dBFS (hard clipping) to -51.8 dBFS (soft clipping/shaping). The ORANGE dB value is where the wave shaping begins and the ceiling setting is where the curve ends.

If you set ORANGE to 0.0dB (clockwise) (1) the transfer function is linear (a straight line) up until the clip ceiling setting. With this setting the processor is not wave shaping, it is hard clipping into a brick wall at the clip ceiling setting. This tends to sound brighter, more aggressive and sometimes crunchy.

If you set ORANGE to -51.8 (counter-clockwise) (2), the input signal starts to wave shape at -51.8 dB below the ceiling setting. This is a soft knee curve that smooths out and takes the bite out of the signal. If there is a clicky or pointy kick drum in the mix, it will push that pointy sound further into the track and make things sound more round.

The default setting of -4.4 dB (3) starts to wave shape 4.4 dB below the clip ceiling setting. This medium knee curve works in many situations and has a pleasing tone that smooths the midrange and subtly expands the lows. If you want it to sound softer and deeper, turn ORANGE counterclockwise. If you want it harder or firmer, turn clockwise. You can think of the orange as a tone knob, but in reality, it is changing the tone by drastically affecting the dynamics of the track. If you add in some clipping and you are now intermixing tone and distortion.

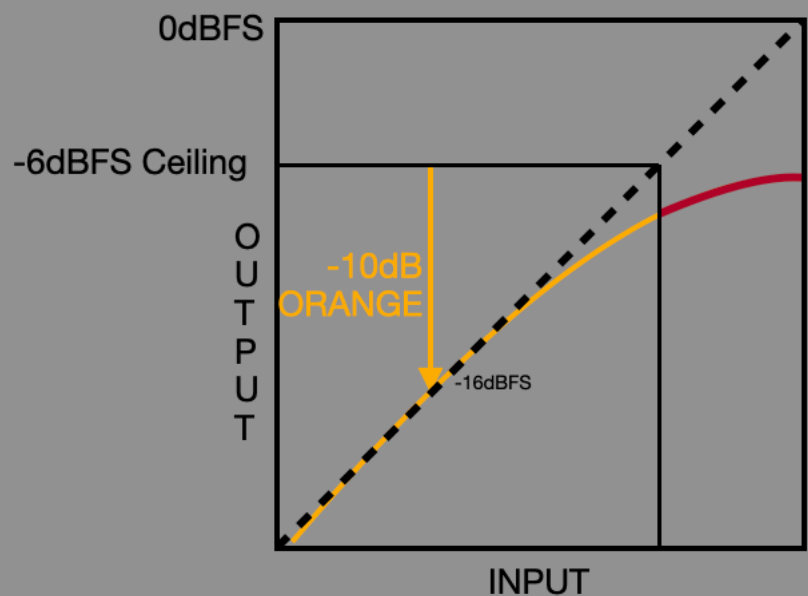
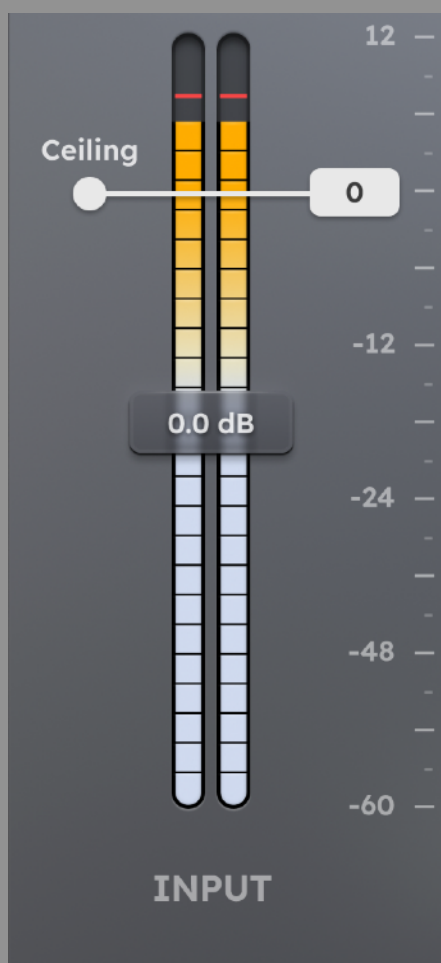




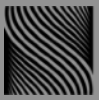
# CEILING



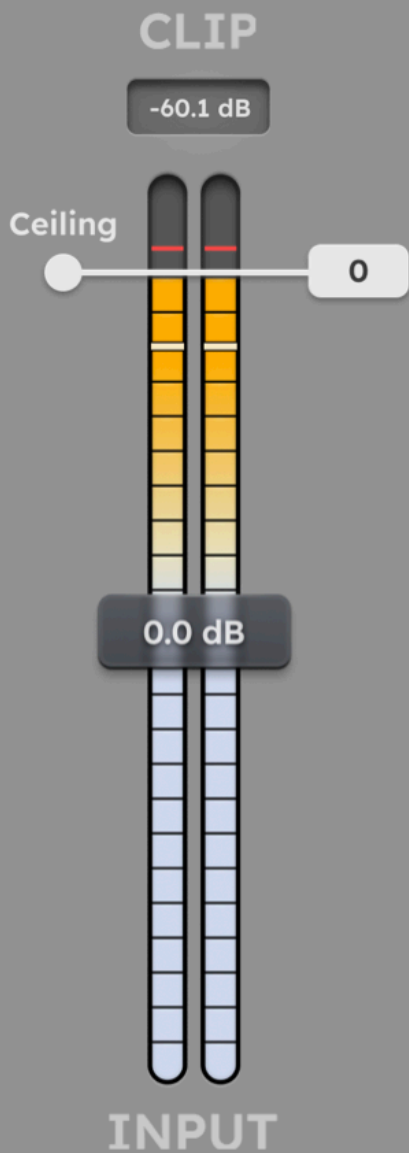
The ceiling control floats over the input meter, allowing you to clip extremely low-level signals without changing the input trims. If a snare drum peaks at  $-24\text{dBFS}$ , you can pull the clip ceiling down to  $-25\text{dBFS}$  and get  $1\text{dB}$  of clipping. You can then adjust the ORANGE setting to get the desired hard, medium, or soft knee clipping. It simplifies the clipping process by moving the clip point away from  $0.0\text{dBFS}$ . The ceiling setting determines the top of the wave shaper and ORANGE determines the bottom. By adjusting the ceiling, you are moving the clip point down and away from  $0.0\text{dBFS}$ . If the ceiling is set to  $-6\text{dBFS}$  and ORANGE is set to  $-10\text{dB}$ , then wave shaping will start at  $-16\text{dBFS}$ . The input signal below  $-16\text{dBFS}$  will be linear, and the signal above  $-6\text{dBFS}$  will be approaching hard clipping.







# INPUT, OUTPUT TRIMS & LINK

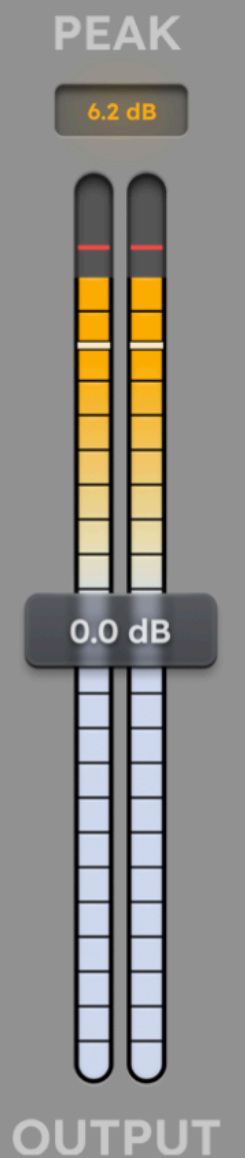


## INPUT TRIM

Input trim is applied to the input signal and the input meter shows the input signal + input trim. The trim floats over the input meter and allows for +/- 12dB of gain. If you push up the input trim, you will see that gain push the meter closer to the clip ceiling.

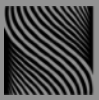
## OUTPUT TRIM

Output trim is applied to the entire plugin output after the true parallel mixer. If the output exceeds 0.0dBFS then the PEAK display will turn orange and show a positive value. Double click to reset..



## TRIM LINK

Trim Link floats over the transfer function allows you to maintain perceived loudness when changing input or output trim. When turning the input trim up by 1dB, Gain Link will turn the output down by 1dB.



# INPUT & OUTPUT METER, CLIP & PEAK DISPLAY

## METERS

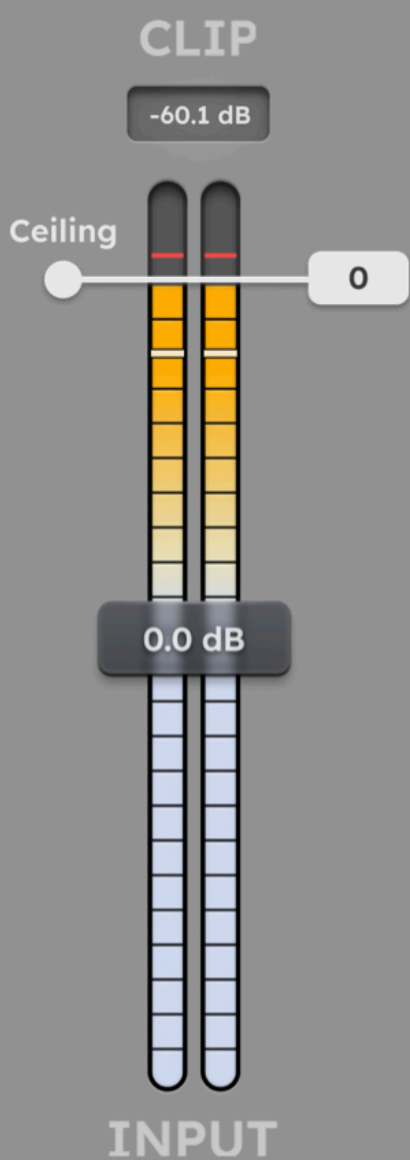
The input and output meters are white and fade to orange as the wave shaping intensifies. When the signal crosses the white ceiling on the input meter, the signal is clipping or approaching clipping, depending on the curve of the knee.

## CLIP VALUE

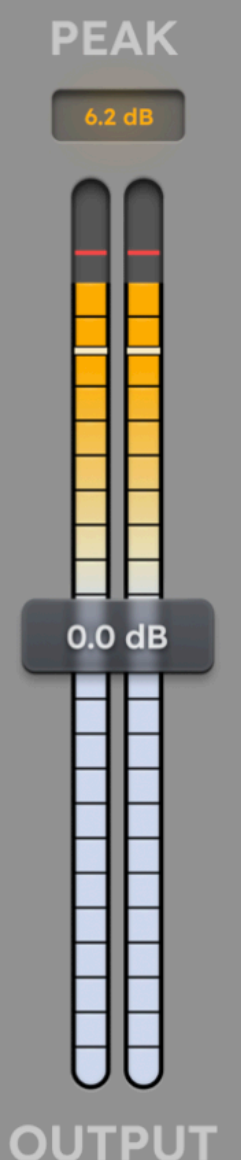
When the signal goes above the clip ceiling on the input meter the clip value will turn orange and show a positive number. That number theoretically implies clipping, but it depends on the shape of the knee that you are using. If you are using a hard knee of 0.0, then it will show the dB that was clipped off the peaks. If you are using a soft knee, then it shows the amount of signal above the ceiling that was wave shaped down, but not necessarily hard clipped.

## OUTPUT PEAK VALUE

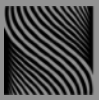
If the output signal goes above 0.0dBFS the PEAK display will turn orange and show a positive value. To bring the output below 0.0dBFS simply use the output trim to reduce the output to an appropriate level.



-60.1 dB



6.2 dB



# THE TRUE PARALLEL MIXER

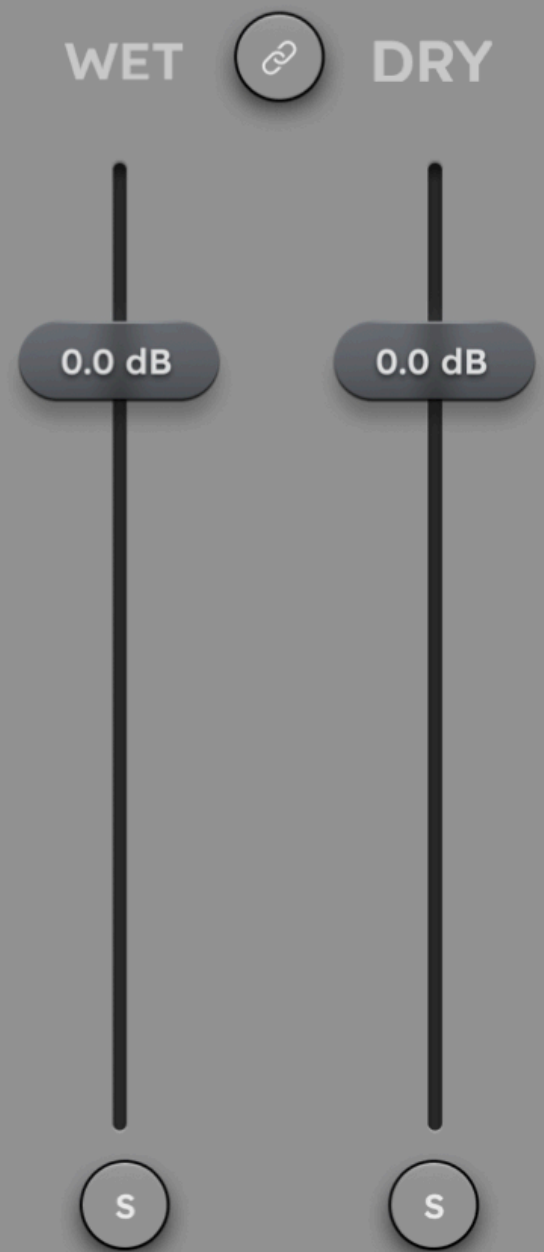
With almost all DAWs running at 32bit float you have 1528dB of dynamic range to work with. Your DAW has all the bandwidth it needs to handle parallel processing, but it's your responsibility to manage your session gain-staging and not overload your mix bus or plugins. You should try to keep Orange Clip's output below 0.0dBFS, but the output can go well above that if you choose.

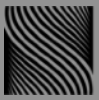
Orange Clip gives you individual control of both the dry and wet signals. That means you can unlink the dry and wet and create your own blends that go beyond percent-based blends you find on most plugins. However, if you prefer that style of dry/wet, just leave the parallel mixer in the default state, and you have it.

LINK

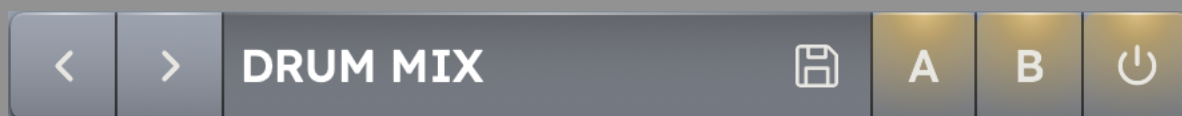


When Link is on, the faders operate like a traditional dry/wet fader found on most plugins. When Link is off, the dry and wet faders work independently, making Orange Clip a true parallel processor. You must be careful when using the mixer unlinked because you can make the signal twice as loud by setting both the dry and wet faders to 0.0 dBFS, and that will most likely clip processors following Orange Clip. Use the output trim to lower the output if it is above 0.0 dBFS.





# PRESETS, AB & INTERNAL BYPASS

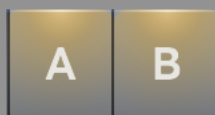


## PRESETS

Saving Presets:

- Click the disk button to save a new preset
- Name the preset and hit enter
- Click the trashcan to delete presets

## AB

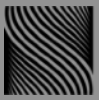


AB made simple. When you first open Orange Clip, both A and B states are active; they are both lit up. As you make changes to the settings, they are applied to both A and B. Only when you click A or B will they unlink so that you can make more detailed changes to one plug-in state. Option-click A to copy to B or Option-click B to copy to A. You can toggle between A and B by simply clicking A or B repeatedly.

## BYPASS

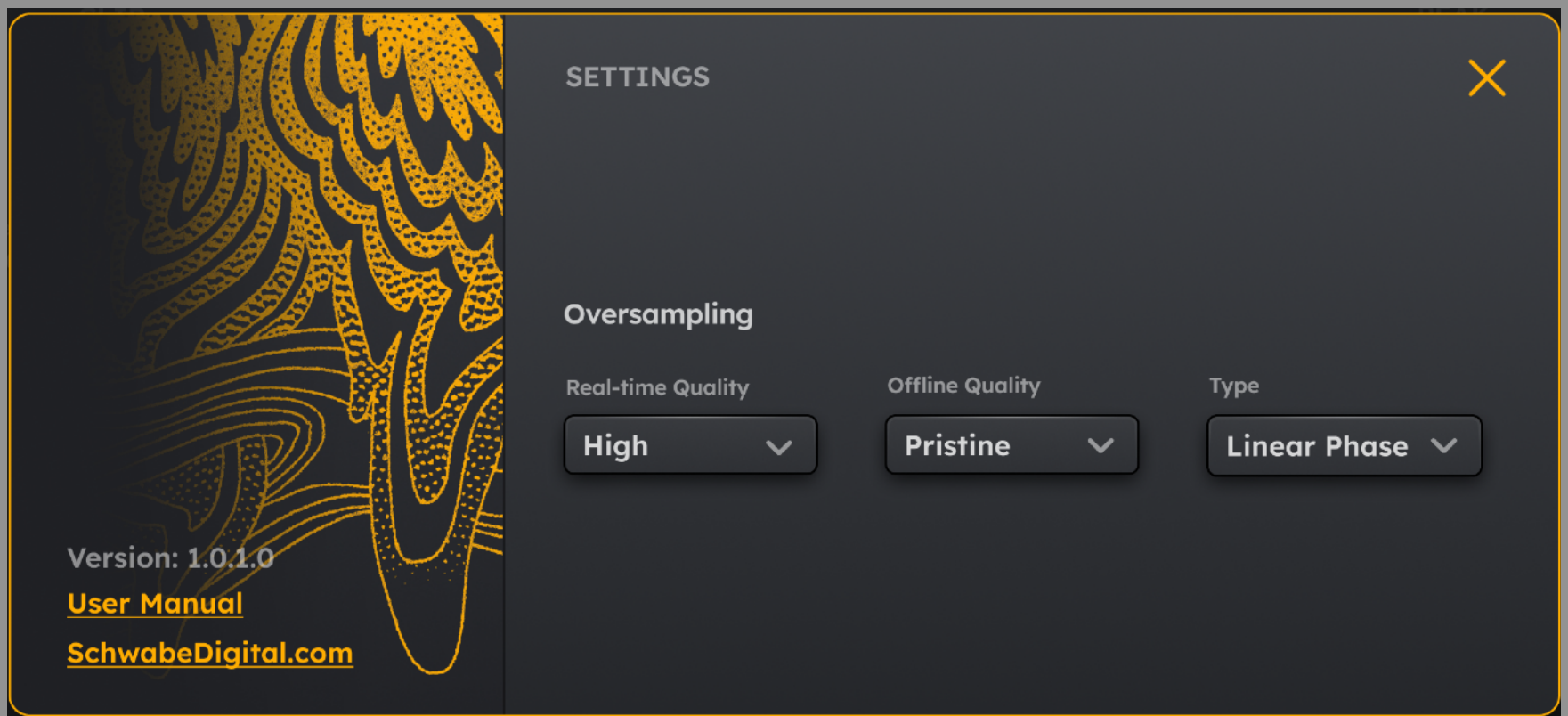


This is a true bypass that is internally time-aligned with the plugin delay. When automating the bypass, you should use the true bypass rather than the DAW's bypass function.



# SETTINGS PAGE

I designed Gold Clip and Orange Clip to have a consistent sound regardless of the sampling rate of your DAW. To achieve this, we programmed the oversampling rate to modulate depending on the sample rate of the session. That way, High, Pristine and Extra Pristine sound exactly the same, regardless of the sample rate of your session. Let me break down how it works.



## Oversampling Rate

**OFF** - 0x (44.1kHz & 48kHz sessions), 0x (88.2kHz and 96kHz sessions)

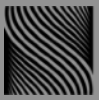
**High** - 4x (44.1kHz & 48kHz sessions), 2x (88.2kHz and 96kHz sessions)

**Pristine** - 8x (44.1kHz & 48kHz sessions), 4x (88.2kHz and 96kHz sessions)

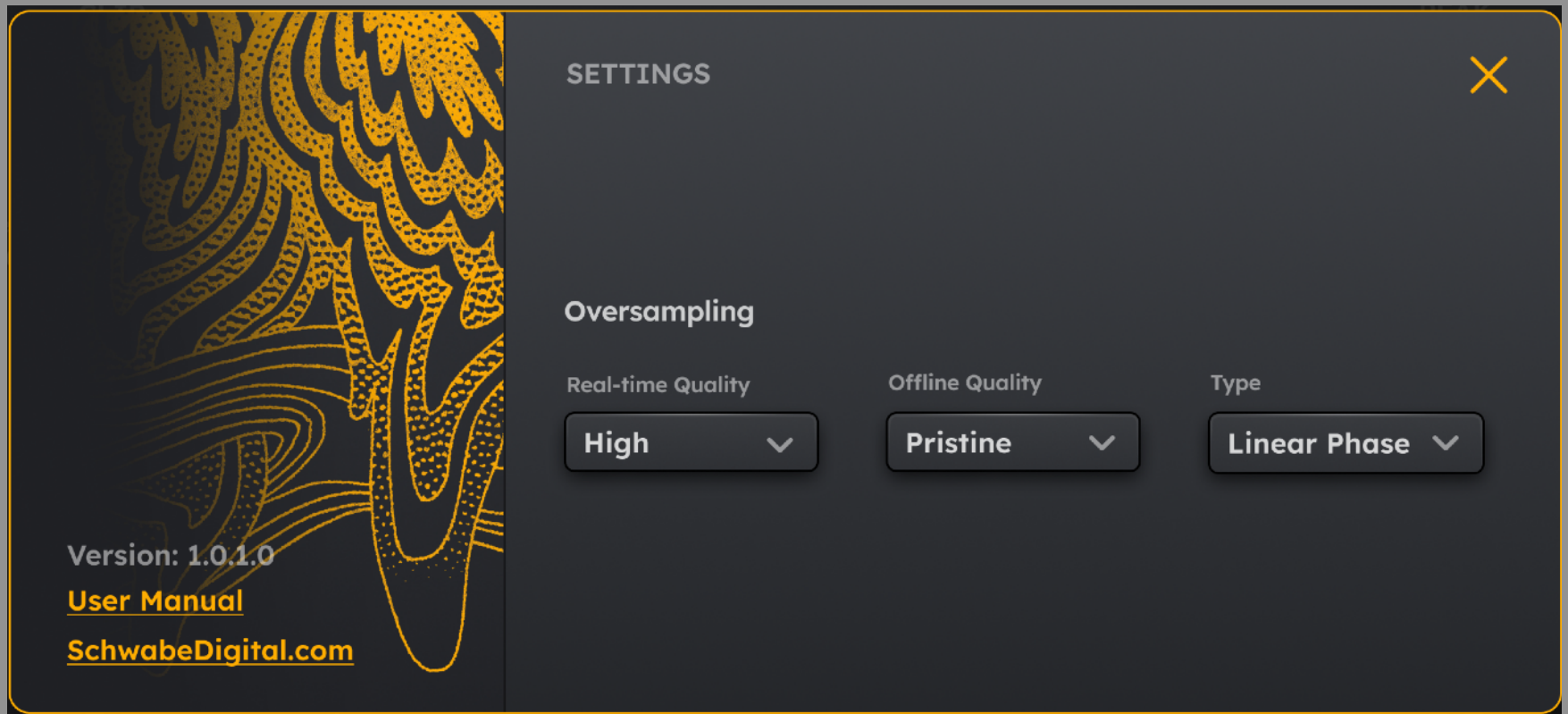
**Extra Pristine** - 16x (44.1kHz & 48kHz sessions), 8x (88.2kHz and 96kHz sessions)

Orange Clip allows you to select separate sample rates for real-time processing and offline bouncing. This allows you to monitor with a lower hit to your CPU but render/bounce with extreme oversampling.





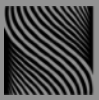
# SETTINGS PAGE



## Oversampling Type

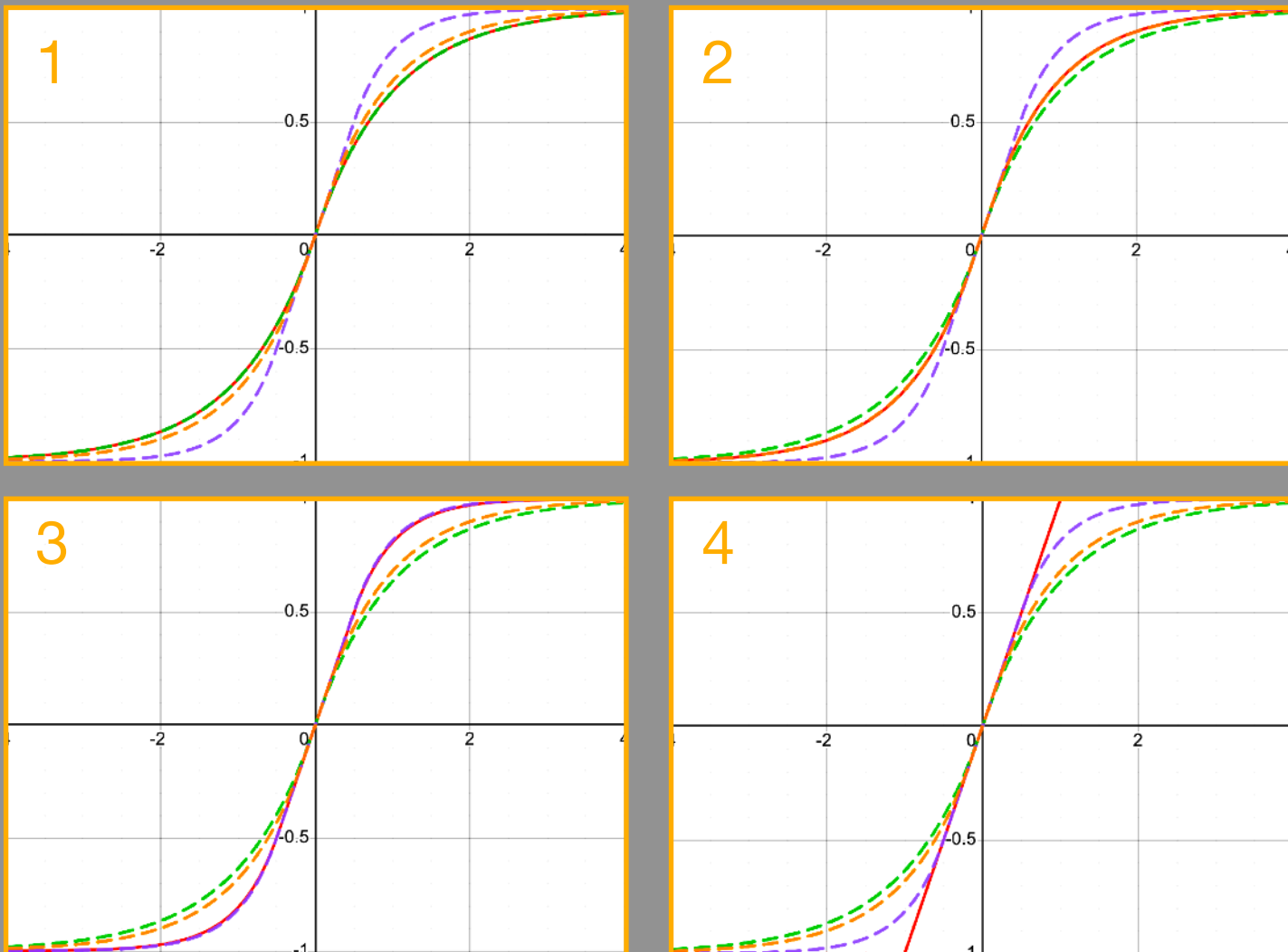
**Linear Phase** – Uses a custom linear phase oversampling technique. This option is suggestion if you are doing parallel processing within Orange Clip.

**Minimum Phase** – Uses a custom minimum phase over sampling technique. This option is sometimes better for low frequency transient information that does not require parallel processing.



# DEVELOPMENT

We spent an endless amount of time trying to determine the exact mathematical equation that makes ORANGE CLIP sound so good, and that equation matches its inspiration in every detail: dynamically, harmonically, and sonically. It is exacting to that legendary sound, but ORANGE CLIP has so much more power built into it. Below are some transfer functions showing ORANGE CLIP's dynamic response against its inspiration. Image (1) shows ORANGE CLIP at the 100% setting, Image (2) at the 50% setting, and Image (3) at the default setting. Image (4) shows ORANGE CLIP set to "hard."

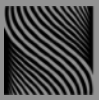


RED = ORANGE CLIP PLOT

GREEN dotted = 100% setting on inspiration processor

ORANGE dotted = 50% setting on inspiration processor

PURPLE = Default setting on inspiration processor

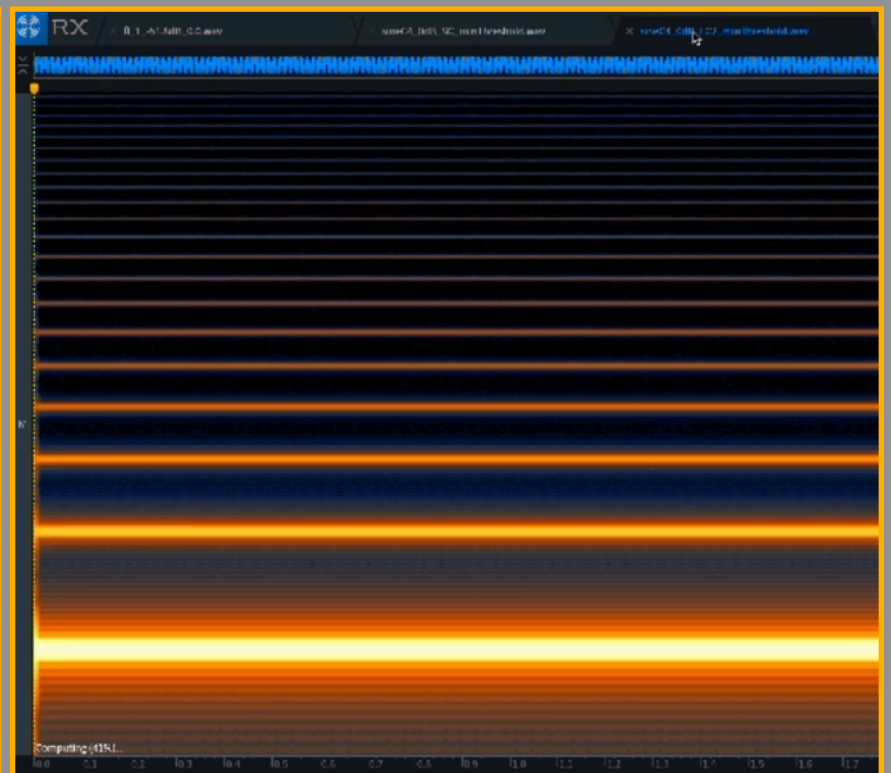
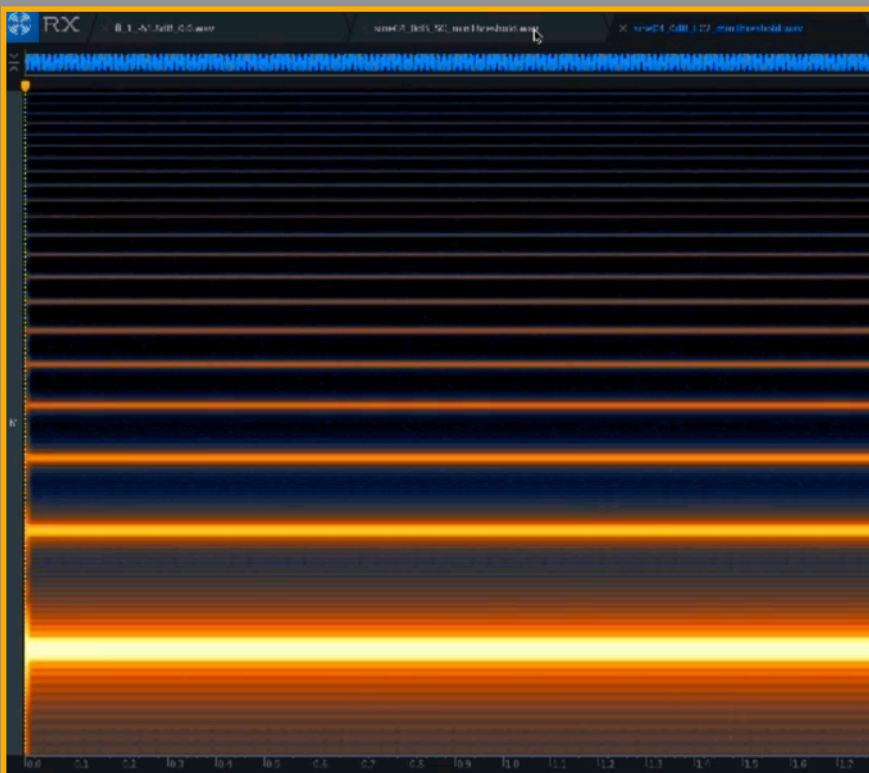


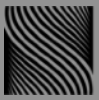
# DEVELOPMENT

Below shows the harmonic analysis of ORANGE CLIP and its inspiration.

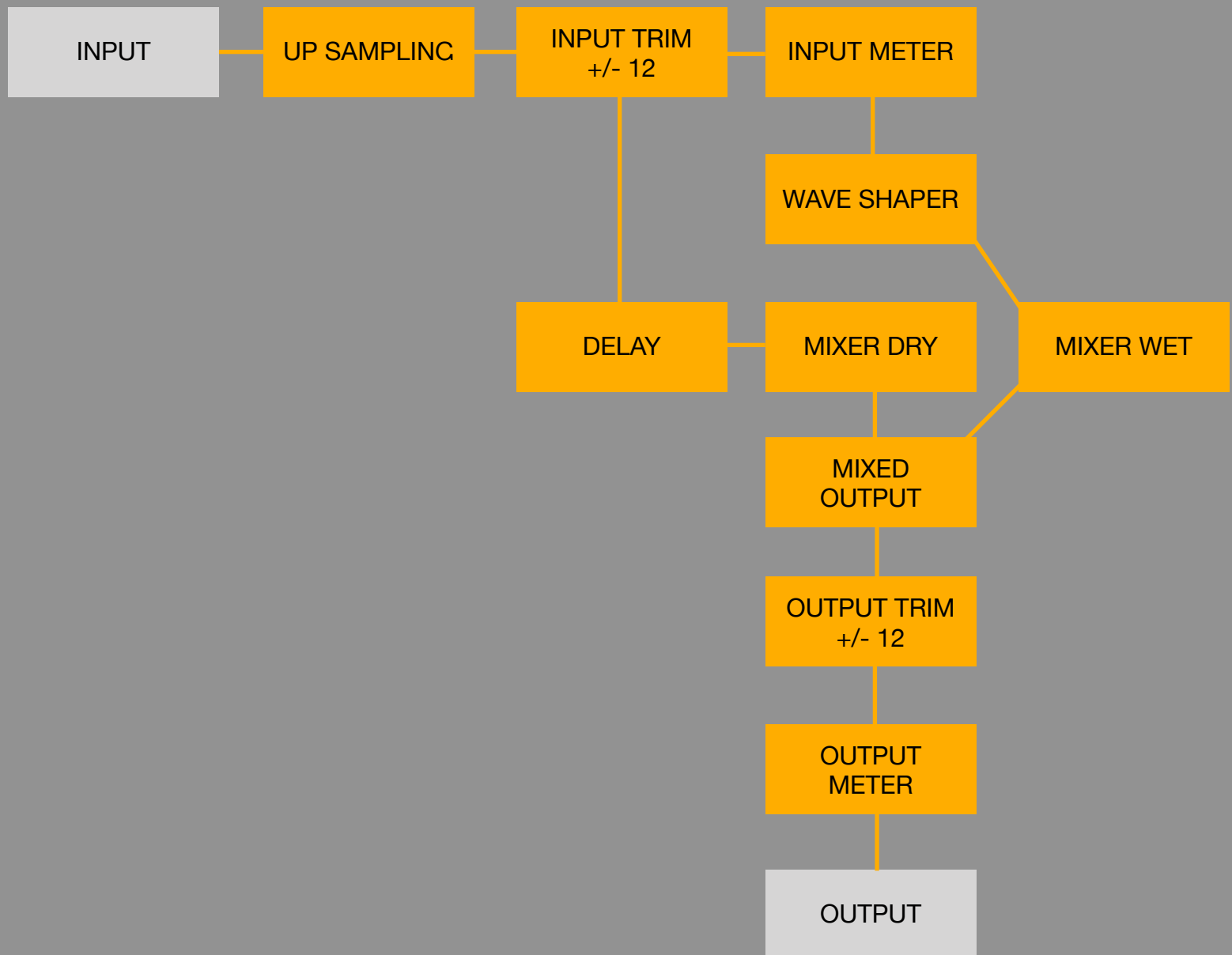
ORANGE CLIP

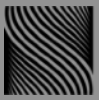
Inspiration





# SIGNAL FLOW





# SYSTEM REQUIREMENTS & SESSION COMPATIBILITY

We highly encourage you to use modern computers with Orange Clip. Computers older than 2018 are most likely not supported. Please test Orange Clip on your system before purchasing.

## MAC:

Mac OS 10.13 or higher

Native Silicon Support

Apple Intel - Intel Core 2 Duo or higher, 4GB RAM minimum

## PC:

Windows 11 (recommended)

Windows 10

Intel Core 2 Duo / AMD Athlon 64 X2 or higher, 4GB RAM minimum

## AUDIO SESSION COMPATABILITY:

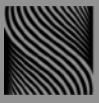
16bit, 24bit or 32bit

44.1kHz, 48kHz, 88.2kHz or 96kHz sessions (192kHz not supported)

VST3, AU AAX







# CREDITS

## DSP & IMPLEMENTATION:

Vlad Voina ([vocode.io](http://vocode.io))

## PRODUCT DESIGN:

Ryan Schwabe ([RyanSchwabe.com](http://RyanSchwabe.com))