USER MANUAL

_BUS PEAK

ARTURIA

_The sound explorers

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Thank you for purchasing Bus PEAK!

This manual covers the features and operation of Arturia's **Bus PEAK**, a new audio plug-in intended for limiting, controlling clipping, and final loudness management of your mix. While easy enough to use for a musician who is not very familiar with limiters, its processing quality rivals that of professional broadcast and mastering tools that can cost many times more.

Be sure to register your software as soon as possible! When you purchased Bus PEAK, you were sent a serial number and an unlock code by e-mail. These are required during the online registration process.

Special Messages

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications without notice or obligation to update the hardware or software that has been purchased.

IMPORTANT:

The software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause ear damage or even permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

EPILEPSY WARNING – please read before using Bus PEAK

Some people are susceptible to epileptic seizures or loss of consciousness when exposed to certain flashing lights or light patterns in everyday life. This may happen even if the person has no medical history of epilepsy or has never had any epileptic seizures. If you or anyone in your family has ever had symptoms related to epilepsy (seizures or loss of consciousness) when exposed to flashing lights, consult your doctor prior to using this software.

Discontinue use and consult your doctor *immediately* if you experience any of the following symptoms while using this software: dizziness, blurred vision, eye or muscle twitches, loss of consciousness, disorientation, or any involuntary movement or convulsion.

Precautions to take during use

- Do not stand too close to the screen
- Sit a good distance away from the screen
- Avoid using if you are tired or have not had much sleep
- Make sure that the room is well lit
- Rest for at least 10 to 15 minutes per hour of use

Introduction

Congratulations on your purchase of Arturia Bus PEAK

As with all of our products, we believe in offering the best of all possible worlds in a single package and letting you choose how you want to use it. In Bus PEAK, those two worlds can be thought of in many ways. It can be used across your final mix output as the ultimate loudness management tool, conforming your audio to industry standards for streaming and broadcast. It can simply add punch to your final mix, or ensure volume consistency between multiple songs on an album. It can be used experimentally to mangle sound on purpose. Then, we have the two worlds of beginner and expert: Bus PEAK is an expert-level processing tool with an interface even someone who has never touched a limiter or compressor before can easily comprehend and get results from in minutes. This is because Bus PEAK essentially *is* the expert, marshaling highly complex and great-sounding dynamics processing underneath a handful of intuitive parameters.

We hope Bus PEAK will help your music stand out and command attention!

Peace, love, and music,

The Arturia team

Be sure to visit the www.arturia.com website for information about all of our other great hardware and software instruments. They have become indispensable, inspiring tools for musicians around the world.

Table Of Contents

1. WELCOME TO BUS PEAK 3
    1.1. What does a limiter do? 3
    1.2. How it works 4
    1.3. Use cases 4
    1.4. Understanding loudness 5
    1.5. Bus PEAK feature summary 6
2. ACTIVATION AND FIRST START 7
    2.1. Compatibility 7
    2.2. Download and install 7
        2.2.1. Arturia Software Center (ASC) 7
    2.3. Working with Bus PEAK as a plug-in 8
        2.3.1. Audio and MIDI settings 8
3. BUS PEAK MAIN PANEL 9
    3.1. Common behaviors 9
        3.1.1. Value indicators 9
        3.1.2. Parameter descriptions 10
        3.1.3. Fine tuning 10
        3.1.4. Double-click for default 10
    3.2. Input Section 11
        3.2.1. Usage examples 12
        3.2.2. Tone Controls 13
    3.3. Clipper and Limiter 17
        3.3.1. Clipper 17
        3.3.2. Limiter 19
        3.3.3. True Peak 20
        3.3.4. Delta monitor 20
        3.3.5. The Clipper and Limiter in action 21
    3.4. Master Output 22
        3.4.1. Master readout options 22
        3.4.2. Master Delta 23
        3.4.3. Loudness Target menu 23
    3.5. Engine Settings 24
        3.5.1. DC Filter 25
        3.5.2. Stereo Link 25
        3.5.3. Dither 25
4. THE TOOLBARS 26
    4.1. Upper Toolbar 27
        4.1.1. Main Menu 27
        4.1.2. Preset Browser access and Name Pane 30
        4.1.3. Dual settings and copy 31
        4.1.4. Tone Control button 31
    4.2. Lower Toolbar 32
        4.2.1. Parameter Descriptions 32
        4.2.2. Quality 33
        4.2.3. Equal Loudness 33
        4.2.4. Bypass 34
        4.2.5. Undo, Redo, and History 34
        4.2.6. CPU Meter 35
        4.2.7. Resize handle 35
5. SELECTING PRESETS 36
    5.1. Preset Name Pane 36
        5.1.1. The Arrows 36
        5.1.2. Preset quick access 37
    5.2. The Preset Browser 38
    5.3. Searching Presets 39
        5.3.1. Using Tags as a filter 39
        5.3.2. Banks 41
    5.4. The Results Pane 41
        5.4.1. Sorting Presets 41
        5.4.2. Liking Presets 42

5.4.3. Shuffle button 42
5.4.4. Featured factory Presets 43
5.5. Preset Info Section 43
5.5.1. Preset Info quick menu 44
5.5.2. Edit Style 45
5.5.3. Editing info for multiple Presets 45
6. SOFTWARE LICENSE AGREEMENT 46

1. WELCOME TO BUS PEAK

Bus PEAK is an audio limiter with a myriad of uses and extremely high audio processing quality. We meant it to be powerful and versatile but also easy to use – an expert engine underneath an interface a beginner can get the hang of in minutes. As its name implies, it is intended for use on audio buses. Usually that would be the master stereo bus in your DAW, but you could place it on a send for a group of tracks as well.

Where many of our plug-ins emulate classic hardware effects or synthesizers, Bus PEAK is all original from the ground up. We believe its processing quality and "audio intelligence" rivals that of processors used in the mastering and broadcast industries that can cost thousands of dollars.

Introductory chapters in our manuals often talk about why we made a certain plug-in and how cool it is, but we encourage you to read this one fully, especially if you're relatively new to limiters. In what follows, we'll outline some concepts that will help you get the most out of Bus PEAK – hopefully without getting too technical or lengthy.

1.1. What does a limiter do?

Limiters and compressors are related, and most musicians are more familiar with compressors. Both reduce the volume of a signal that goes above a certain level, called the threshold. The biggest difference is what happens after that.

Where a compressor turns down *some* of the volume based on the ratio setting, a limiter will not let *any* level through past the threshold. In other words, it's like a compressor with a very aggressive ratio. Its attack phase – the time it takes to start acting once the threshold is passed – is also quick and often not user-adjustable. Many limiters (Bus PEAK included) also have a "look-ahead" ability and can actually start acting before the threshold is passed.

As a rule, compressors are used on just about anything (inserts on individual tracks, sends, and buses), where limiters are traditionally only seen on the master mix bus. A software tool like Bus PEAK certainly encourages experimenting – but it's always good to know the rules before you break them.

At first, limiters revolved around making sure a signal was not too loud for a delivery medium. Imagine watching a 1950s newscast with distorted audio and thinking your TV was broken!

1.2. How it works

Bus PEAK revolves around two main "circuits": a Clipper and Limiter in series. The main role of the Clipper is to tame loud transient peaks, atonal spikes in the signal, and otherwise eliminate or reduce material you *don't* want in order to prepare the sound for the Limiter.

Then, the Limiter makes the content you *do* want sound better using three simple parameters: the threshold, character, and release time. Underneath is a complex algorithm of up to three stages (depending on how you set the controls) doing some very heavy lifting to analyze and limit the sound. This includes look-ahead processing to see what the incoming signal is *about* to do in terms of amplitude.

That said, you can also turn either the Clipper or Limiter off and use the other processor separately.

We will explain what each of the Clipper and Limiter controls do in much more detail in their section [p.17] in Chapter 3.

1.3. Use cases

We have described the "normal" way Bus PEAK may be used. But this is Arturia, so we have anticipated going outside the box, and the variety of factory Presets reflects this. Here is a partial list of applications.

- Mastering
- Ensuring songs on an album or playlist have a consistent loudness profile
- Optimizing tracks for online streaming platforms
- Adding "glue" to a final mix in the fashion of bus compressors found in classic analog mixing consoles
- Maximizing the perceived loudness of a track
- Maximizing bass in genres like hip-hop and EDM
- Adding "air" to treble
- Increasing punch on drums
- Dynamic EQ that responds to the signal in real time
- Creating an intentionally squashed sound if desired
- Trashing the sound using extreme settings

1.4. Understanding loudness

A vintage Philips loudness meter. Image: Raimond Spekking via Wikimedia Commons.

One of the coolest things about Bus PEAK for mixing and mastering is that it allows you to monitor and work in LUFS as well as dB (RMS). Musicians and recordists are pretty familiar with dB as a unit of measurement, but let's look at the difference between RMS and LUFS.

RMS is the traditional way of thinking about decibels and stands for *Root-Mean-Square*. It measures the average energy of an audio signal over time (i.e. not just peaks). It's what most DAWs and plug-ins use for metering, and the standard for the handheld sound meters officials use to enforce noise regulations.

LUFS stands for *Loudness Units, Full Scale*. Mastering engineers tend to think in terms of LUFS. So do the people who make the rules for platforms like Netflix, Spotify, YouTube, Apple Music, and many others, not to mention movie theaters and broadcast events such as the Super Bowl. This is because LUFS is currently the best and most accurate standard for expressing the *real* loudness of a signal.

What does "real" mean in this context? You may have heard the old riddle, "If a tree falls in the forest and no one is there, does it really make a sound?" Let's assume it does – or at least it causes vibrations that propagate through the air. Now replace the tree with a pair of speakers playing in the forest. There *is* an objective, measurable amount of energy coming out of those speakers.

But that's only half the story. The other half is how the human ear and brain interpret that energy, which is neither linear nor accurate. Best possible hearing is approximately 20Hz to 20,000Hz, and within that range we perceive pitches 2,000 - 5,000Hz as loudest, with our ears' gain rolling off on either side. Think about how vintage recordings sound boxy, or how a guitar player with a 50W tube amp can overwhelm a keyboard player using a powered stage monitor boasting 1,000 watts. Historically, effort and technology have been put into compensating for this so we can have pleasant listening experiences – and this is one among hundreds of quirks about human hearing.

The point is, LUFS takes all this into account whereas dB RMS *only* measures the "nobody in the forest" sonic energy. Like RMS, LUFS considers the average sound of an audio clip over time, not just momentary peaks. That makes it the best standard for deciding whether a song, movie soundtrack, or other audio program is too loud, too soft, or just right for a delivery method (streaming, CD, TV broadcast, etc.).

A final point: For media applications, LUFS targets are expressed as a negative value (below zero). The Output section of Bus PEAK offers metering in dB RMS, peak level in dB, and LUFS side by side. There are further options for how this metering works, which we will explore in Chapter 3 [p.23].

1.5. Bus PEAK feature summary

- Flexible Clipper with threshold, knee, and character adjustments
- Limiter with highly sophisticated processing algorithm
- Simple controls make this processing accessible, doing the hard work for you
- Limiter has adjustable release time
- Four processing engine settings (Tracking, Mixing, Mastering, and Render) to balance resolution with CPU resources
- Input Tone Controls for bass and treble, each with adjustable frequency
- Tone Controls act as band-specific "pre-Limiter limiters"
- Ability to link main input gain to Clipper threshold and/or Tone Controls
- Master output metering in dB RMS and LUFS side by side
- LUFS loudness target presets for four industry standards, plus custom
- Equal Loudness mode relates input gain to output
- Factory Presets cover use cases from conventional to experimental
- Full edit history with undo, redo, and direct access to each editing step

Bus PEAK is truly limiting without limits. Let's explore ...

2. ACTIVATION AND FIRST START

2.1. Compatibility

Bus PEAK works with Windows 10 or later, or macOS 10.13 or later. It is compatible with the latest Apple Silicon M-series processors. You can use it as an Audio Unit, AAX, VST2, or VST3 plug-in within your favorite recording software.

2.2. Download and install

You can download Bus PEAK directly from the Arturia Products Page by clicking either the Buy Now or Get Free Demo options. The free demo is limited to 20 minutes of operation.

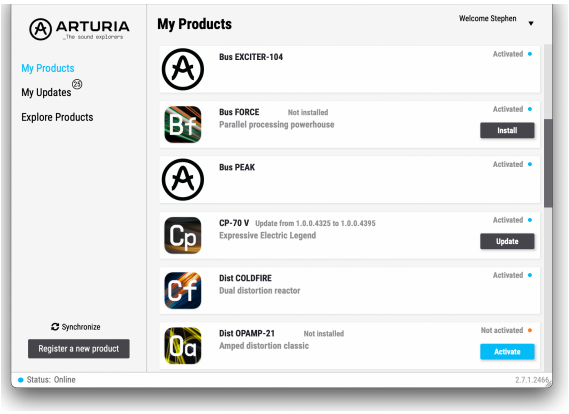
If you have not already done so, now is a good time to create an Arturia account by following the instructions on the My Arturia webpage.

Once you install Bus PEAK, the next step is to register the software. This is a simple process that involves a different software program, the **Arturia Software Center**.

2.2.1. Arturia Software Center (ASC)

If you haven't installed ASC yet, please go to this web page: Arturia Downloads & Manuals.

Look for Arturia Software Center near the top of the page, and then download the installer version for the system you're using (Windows or macOS). ASC is a remote client for your Arturia account, letting you conveniently manage all your licenses, downloads, and updates from one place.



The Arturia Software Center (ASC)

After you complete the installation, do the following:

- Launch the Arturia Software Center (ASC).
- Log into your Arturia account from ASC's interface.
- Scroll down to the 'My Products' section of ASC.
- Click on the 'Activate' button next to the software you want to start using (in this case, Bus PEAK).

It's as simple as that!

2.3. Working with Bus PEAK as a plug-in

Bus PEAK can be used as a *plug-in* within all major Digital Audio Workstation (DAW) programs including Cubase, Digital Performer, Live, Logic, Pro Tools, Reaper, Studio One, and more.

Plug-ins have numerous advantages over hardware, including:

- You can use as many instances on different tracks as your computer can handle (though as the name implies, Bus PEAK is intended for use on master buses and sends).
- You can automate the plug-in's settings via your DAW's automation feature.
- All settings and changes are saved with your DAW project, letting you pick up right where you left off.

2.3.1. Audio and MIDI settings

Since Bus PEAK is a plug-in, settings for audio and MIDI routing are handled in your recording software or DAW. They are generally located in some type of Preferences menu, either at the global or project level, and each product does things a bit differently. So, consult your recording software's documentation for information on how to select your audio interface, activate outputs, set the sample rate, assign MIDI ports, set project tempo, adjust buffer size, and the like.

3. BUS PEAK MAIN PANEL

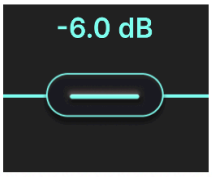
This chapter details the main things you'll see and features to take advantage of while using Bus PEAK in a project.

Number	Area	Description
1.	Input Section [p.11]	Controls and monitoring for audio input to the plug-in, plus tone control
2.	Clipper and Limiter [p.17]	Level management and monitor controls for main Clipper and Limiter
3.	Master Output [p.22]	Sets and monitors final output, in dB and LUFS
4.	Engine Settings [p.24]	Important options for how Bus PEAK processes audio "under the hood"

3.1. Common behaviors

All Arturia FX Collection plug-ins share some common control behaviors to make operating them easier.

3.1.1. Value indicators

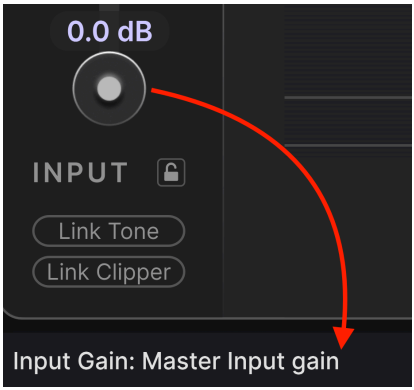


The dB value indicator for the Limiter slider

Virtually every control in Bus PEAK that can be moved has a numerical readout of the value adjacent to it. In addition to moving the control, you can drag on this value to change it. When using a mouse scroll wheel, the values move in predictable steps: 2% for percentages and 0.5dB for levels.

Our other FX and instrument plug-ins normally use pop-up tool tips that appear when you hover over a knob, slider, or button. Given the purpose of Bus PEAK, and its clean graphic design, we decided to make the numbers always present. (Pop-ups are still present for the few controls that lack a full-time numerical display, such as the Clipper and Limiter character.)

3.1.2. Parameter descriptions



Operating or hovering on any control also displays its name and a brief description of its function in the left corner of the lower toolbar [p.32].

3.1.3. Fine tuning

Hold the right mouse button or Control key while dragging on any knob to adjust it more slowly. This helps when you want to dial in precise values. If your mouse is equipped with a wheel, you can hold the Control key (Windows) or Command key (macOS) and use the wheel to fine-tune as well.

3.1.4. Double-click for default

Double-click on any knob to return it to its factory default setting.

3.2. Input Section

The strip on the left side of the screen controls the gain of the signal going into Bus PEAK. It also features separate Tone Controls that affect the incoming signal. You can see these by clicking the tab on the right to expand the panel, and we will explain them below [p.13].

The main control is the **Input Gain Slider**. This functions as a boost that can help you reach the set threshold where the Clipper [p.17] and/or Limiter [p.19] start to work. Or, you may find that the incoming signal is plenty loud with the slider set at OdB.

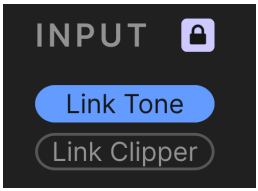
Other important controls in this section are:

- **Input Gain Lock:** The padlock icon keeps the Input Gain slider at the same setting even if you change Presets.
- **Link Tone:** Locks the Tone Control sliders to the Input Gain slider, preserving the relationship between them.
- **Link Clipper:** Locks the Clipper slider to the Input Gain slider, preserving the relationship between them.

These settings interact with each other. If you lock the input gain, but neither *Link Tone* nor *Link Clipper* are activated, then the main slider will stay put when you change Presets, but the Tone Control and Clipper may change depending on the Preset.

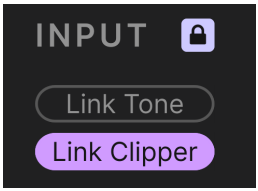
3.2.1. Usage examples

Some simple examples will help make sense of these controls.



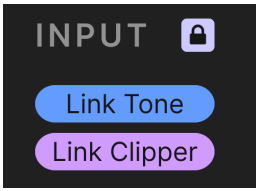
Example 1

Example 1: You want to push the gain to hear the Clipper in action, while keeping the proportions of bass and treble limiting constant. Link the Tone but not the Clipper. To retain the same drive while experimenting across Presets, use the padlock icon.



Example 2

Example 2: You are happy with the sound of the Clipper, but the Tone Controls need more work. Link the Clipper but not the Tone.

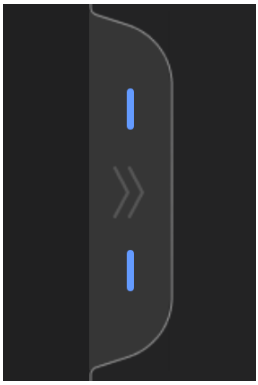


Example 3

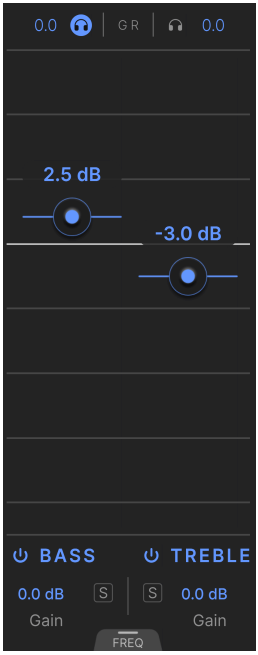
Example 3: You are happy with the Clipper and Tone, but want to maximize the action of the Limiter. Link both Tone and Clipper, then increase the input gain.

What are these "tone controls" we keep mentioning? Glad you asked!

3.2.2. Tone Controls



Click the vertical tab at the center right of the input strip to expand this section and show the Tone Controls. Click the tab again to collapse this area.



These are independent limiters for the bass and treble range, downstream of the input gain but upstream of the main Clipper and Limiter module. It's important to remember that these are more than simple EQ bands – they're limiters that actively follow and reduce gain above and below frequencies you can set.

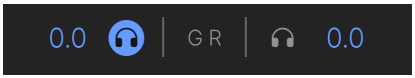
The Bass slider can bring density to stabilize, thicken, and control the low end. The Treble slider can smooth out hard-hitting transients (think of hi-hats or top loops) and add "air" without harshness. The two modules work identically, so we will cover their common controls just once.

When the Tone Controls area is collapsed, the vertical lines in the tab light up to show which band is active: the bottom one for bass and the top for treble.

3.2.2.1. Threshold sliders

The large sliders set the level thresholds above which bass and treble signals will be reduced.

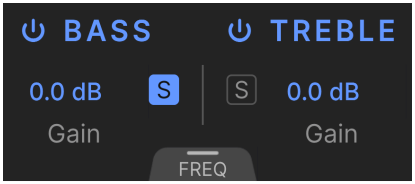
3.2.2.2. Delta monitors



At the top of the Tone Control stack are headphone icons. Clicking either one lets you listen to only the material that control is *removing*, i.e. the *delta* (change) in the signal. It is not possible to listen to both the bass and treble bands at once.

Next to either headphone is a numerical value. When Bus PEAK has a signal passing through it, these change in real time to show the maximum gain reduction happening in each band, in dB, over a time period of one second.

3.2.2.3. Toggles, Gain, and Solo



This section has three useful controls:

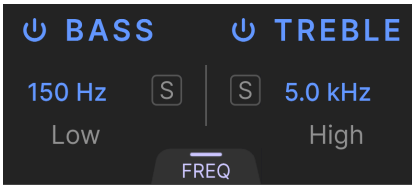
- **On/Off:** The toggle icons turn the bass and treble bands on and off independently.
- **Gain:** Drag up or down on the numerical value to adjust the EQ band gain for each band separately. Since this *is* an EQ band, you are in fact adding or removing bass or treble.
- **Solo:** Click either S button to listen only to the bass or treble band.

A couple of notes apply here. As with the delta monitors, you can solo either bass or treble but not both (that's the same as having both solo buttons turned off). If a band is soloed, its headphone icon at the top will appear a slightly lighter grey if not activated.

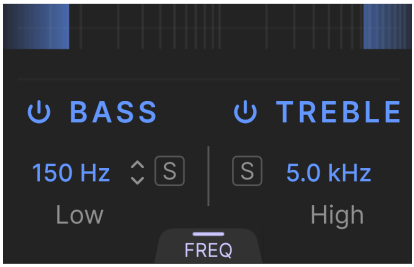
> Think of the Tone Controls as a dynamic EQ. You can add or remove energy from the low and high shelving bands using the Gain setting, then the main slider provides brickwall limiting, and hence gain reduction, in each band. To work on a band, solo it to listen in focus. On/off lets you toggle between processed signals and unprocessed signals (without disengaging an active solo). Toggling the headphone icon on a soloed band lets you hear just that band or the delta applied by its limiting.

3.2.2.4. Frequency mode

Click the **Freq** tab at the bottom of the tone area, and the input gain controls will change to frequency controls, like so:



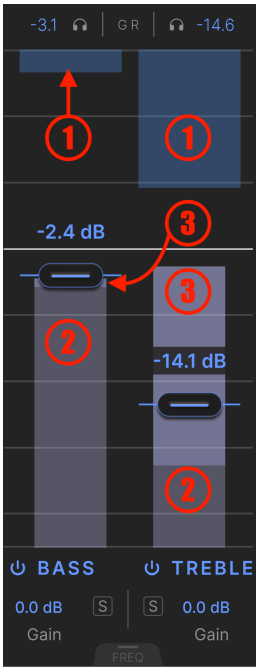
Drag up or down on either numerical value to set the shelf frequency where the control will begin limiting bass or treble. Gain reduction will apply to material below this frequency for bass, or above it for treble. This will happen in full below/above the shelf frequency; half the gain reduction will apply *at* that frequency. Hovering over either value causes a horizontal graphic to appear:



This simply gives a quick visual of which frequencies are being affected, in blue.

3.2.2.5. The Tone Controls in action

When Bus PEAK is actively processing a signal, the Tone Controls area has an animated visualizer that reflects the audio activity in each band.

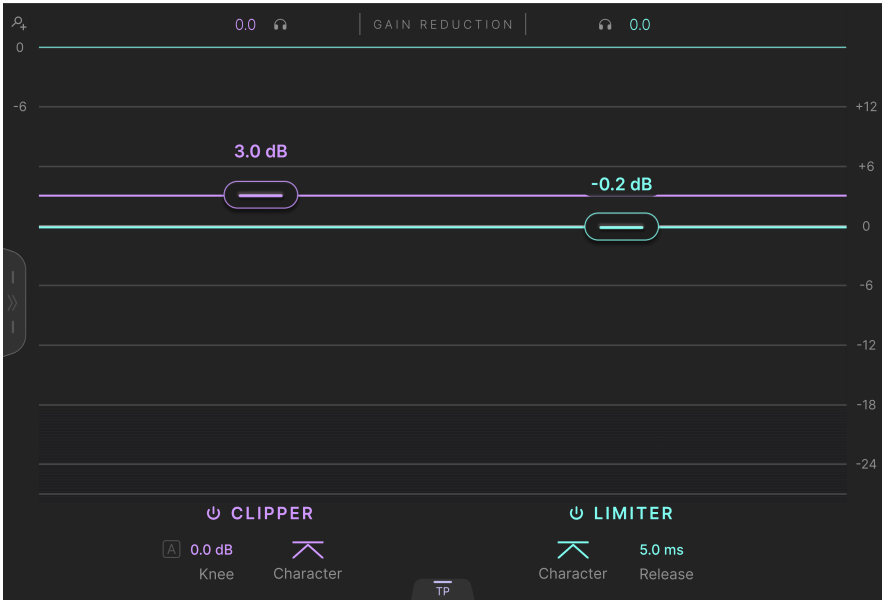


The above example uses some exaggerated settings to ensure that all graphics are visible.

1. Bands moving down from the top show the amount of gain reduction, which is also displayed by the numbers above them.
2. Bands moving up from the bottom show the signal level in dB RMS.
3. The upper, brighter area of these bands depicts signal peaks.

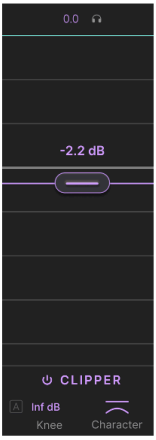
> If the Threshold slider is all the way into the RMS area (not just the peak), you are likely applying too much limiting for mixdown or mastering purposes. For creative experiments, of course, do whatever you like!

3.3. Clipper and Limiter



The central functions of Bus Peak are a Clipper and Limiter, which are meant to work separately or together. As outlined in the introduction [p.4], when they work together, the Clipper's main role is to control the stuff you *don't* want, like sharp or unmusical transients. Then, the Limiter is there to make the stuff you *do* want sound better.

3.3.1. Clipper

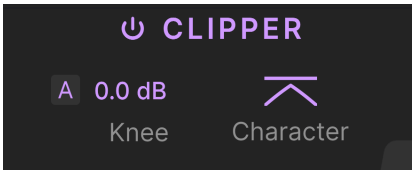


The Clipper's main control is the large Threshold slider. The lower the setting, the more the Clipper will shave off signal peaks. When the Clipper is on, the horizontal purple line (red in light theme [p.29])extends across the entire gain reduction display.

3.3.1.1. Clipper On/Off

Click the On/Off icon to engage or bypass the Clipper without losing any of its settings.

3.3.1.2. Clipper Knee



The "knee" of a limiter or compressor is how the processor works when the threshold is reached. It is different from attack. Attack is the time it takes for the processor to start working *at all* once the threshold is crossed. Once that happens, the knee determines whether the compression/limiting gets to full ratio gradually (soft knee), near-instantly (hard knee), or somewhere in between.

Since this is a Clipper, the ratio is extreme by design. Knee widths range from OdB to infinite dB. Click the **A** icon for automatic knee mode, in which the knee is equal to twice the input gain.

> Auto knee is the same behavior as in the soft-saturation feature of a certain sought-after "gold" analog-to-digital converter. Infinite knee duplicates the "inflating" curve of an equally famous audio enhancement plug-in.

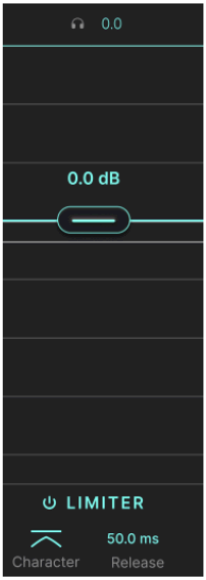
3.3.1.3. Clipper Character

The **Character** graphic sets the look-ahead and release times together. At the sharpest setting, these are instant and produce pure clipping. At the softest, they make the Clipper behave like a fast limiter, with times of O.5ms (half a millisecond) each. That may not seem like much of a range, but the Clipper is supposed to be brutally fast. For broader dynamics processing, we have the Limiter.

A high (more pointed) Character value produces brighter clipping, while a lower setting offers a warmer sound.

> Combine high Knee and low Character values to create colorful limiting that sounds dark and dense. Character at O and Knee at infinity is the most extreme example.

3.3.2. Limiter



The main Limiter in Bus PEAK also revolves around a Threshold slider. When the Limiter is on, the slider's teal blue horizontal line (green in light theme [p.29]) extends across the gain reduction display.

3.3.2.1. Limiter On/Off

Click the On/Off icon to engage or bypass the Limiter without losing any of its settings.

3.3.2.2. Limiter Character

Like the Clipper, the Limiter has a Character control at the bottom. We mentioned in the introduction chapter that the Limiter uses a complex three-stage algorithm, and that it looks ahead to anticipate upcoming signal peaks. The setting of the Character control is relevant here.

- At 0% (smooth rounded shape), one stage is active with no automation and static look-ahead and release times. This is the most predictable Limiter behavior.
- At 50%, one stage is active and the look-ahead and release times become dynamic, i.e. they can change depending on the program material.
- Above 50%, two stages are active. The attack time of the first stage increases, allowing fast transients to be caught by the much faster second stage.

What about the third stage? That's activated by the True Peak [p.20], described below.

3.3.2.3. Limiter Release

This setting determines the *maximum* time the limiting algorithm takes to cease once sound has fallen back below the ceiling. (The value applied at any point may be less due to factors such as automation.) Drag up or down on this field to adjust it from 0 to 2,000 milliseconds. Lower values result in louder sound but can lead to distortion; higher values are cleaner but can cause an audible pumping effect.

3.3.3. True Peak

The Clipper and Limiter share a True Peak function, which is engaged by clicking the small tab at bottom between the two. If the Limiter is on, True Peak enables the third limiting stage intended to catch the signal's loudest peaks according to the True Peak standard. If the Limiter is off but the Clipper is on, this function applies to the Clipper.

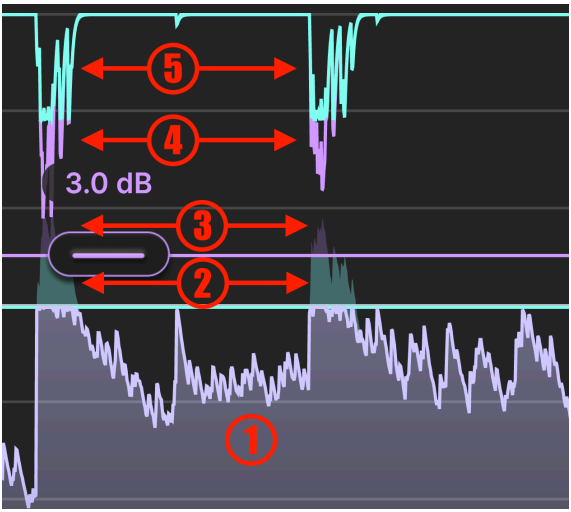
> While RMS and LUFS measure loudness over time [p.5], peak monitoring captures a moment of the signal in time – normally a loud one such as a drum hit or emphatic vocal note. "True peak" is a more recent and accurate method; in Bus PEAK, it analyzes the gap between samples and interpolates the peak level of the hypothetical analog waveform that would occur.

3.3.4. Delta monitor

Above the Clipper and Limiter are headphone icons. Like with the Tone Controls [p.13], clicking either of these lets you hear only the part of the signal the Clipper and/or Limiter are *removing*. You can listen to either or both, so long as the corresponding processor is turned on.

Next to each is a dB readout that changes in real time to reflect the gain reduction being applied by the Clipper and Limiter.

3.3.5. The Clipper and Limiter in action

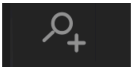


When Bus PEAK is actively processing sound, the Clipper/Limiter section has a detailed Visualizer that scrolls across the screen to show what the processors are doing in real time.

1. Portion of signal unaffected by Clipper or Limiter
2. Loud passages reduced by Limiter
3. Higher loudness peaks removed by Clipper
4. Gain reduction applied by Clipper (beyond what the Limiter) applies
5. Gain reduction applied by Limiter

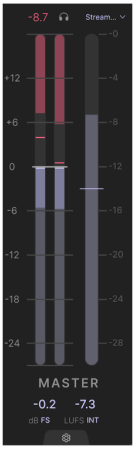
> Play a track with Bus PEAK across your master output, and adjust the controls we've described in this section. Watching the Visualizer is a great way to see which processor is doing which part of the overall job.

3.3.5.1. Gain Reduction Scale



The magnifying glass icon at the upper left of the Visualizer toggles the scale of the gain reduction graph between 3dB or 6dB increments. The + option (3dB) allows you to view more detail, especially when only light gain reduction is occurring.

3.4. Master Output



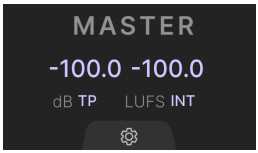
The Master section is mainly for metering, but includes a handful of controls that fine-tune how that metering responds.

It consists of a stereo dB (RMS with peak hold) meter on the left and an LUFS meter on the right.

In the dB meter, the more saturated color bands at the top of the bars indicate momentary peaks. The meter displays a peak hold of one second, which you can clear by clicking in the peak area. The red bars that come down from the top indicate the overall gain reduction being applied by Bus PEAK in real time.

The LUFS meter on the right reads out the all-important Loudness Units, Full Scale [p.5] we discussed in the introduction, and just might be Bus PEAK's "killer app" for making your music delivery-ready. There's more about this in the loudness target menu [p.23] paragraph below.

3.4.1. Master readout options



At the bottom of the master meter bars are readout numbers showing the signal level. Below these are two settings that determine what each meter shows you.

3.4.1.1. dB meter setting

Drag up or down next to "dB" to select from two options for how the dB meter displays the inter-sample sound level.

- *FS:* The dB meter reads at full scale.

- *TP:* The dB meter applies the True Peak standard.

> What is the "inter-sample" peak level? This simply refers to the fact that for any given instant in time, this meter in Bus PEAK is interpolating the values between two samples in your digital audio signal, rather than taking a snapshot of a single sample.

3.4.1.2. LUFS meter setting

Drag up or down next to the "LUFS" label to select from the following three meter behaviors:

- *M (momentary):* The LUFS meter takes momentary snapshots of the sound. Visually, the bar will move the most rapidly in sync with your music.
- *ST (short-term):* At any given time, the LUFS meter shows the average signal level over three seconds.
- *INT (integrated):* The meter takes an integrated average over time. This is likely the most useful setting for loudness-targeting, and the meter bar moves the most gradually.

3.4.2. Master Delta

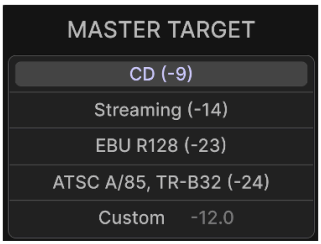
Click the headphone icon at the top of the meter bars to listen to the sum total of all changes to the signal applied by Bus PEAK. To the left is a real-time meter showing the combined gain reduction from the Clipper and Limiter modules.

Since this is the overall change relative to the input level, adjustments to the Input Gain slider will not be heard, but band gains from the bass and treble Tone Control gains will.

3.4.3. Loudness Target menu

The LUFS meter in Bus PEAK is the perfect tool to optimize your tracks for various delivery methods.

Click the carat button to the right of the headphone icon to bring up the following menu. It displays various *loudness targets*, which are maximum volumes (calculated over time according to the LUFS standard) allowable for different media.



This menu optimizes the output metering for different loudness standards

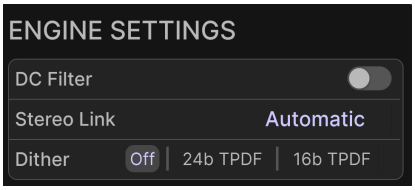
The horizontal centerline in the LUFS meter bar changes to indicate which standard you select. The targets are:

- *CD:* -9dB LUFS, a good target for delivery on Compact Disc.
- *Streaming:* -14dB LUFS, recommended for platforms such as Spotify, SoundCloud, YouTube, and others.
- *EBU R128:* -23db LUFS, the standard for TV according to the European Broadcast Union.
- *ATSC A/85, TR-B32:* -24dB LUFS, both broadcast standards using the same spec.
- *Custom:* Set your own target.

ATSC A/85 was created by the Advanced Television Systems Committee, then adopted by the U.S. FCC to enforce the CALM (Commercial Advertisement Loudness Mitigation) act. This law aims at commercials that play obnoxiously louder than the show being watched. TR-B32 is a Japanese broadcast standard and is functionally the same.

3.5. Engine Settings

At the bottom of the Master section is a gear-shaped icon on a tab. Click the gear to open the Engine Settings panel:



The DC Filter and Stereo Link settings are saved at the Preset level. The Dither setting is global and remains the same across Presets. Of course, all are saved with your DAW project.

3.5.1. DC Filter

Engaging this toggle places an input filter in the signal chain, whose purpose is to remove DC offset.

> DC offset is a shifting of the baseline of a waveform relative to where its zero crossing (the midpoint between positive and negative cycles) should be. If you visualize sound waveforms, they're like alternating current (AC) because their cycles move up and down. In fact, the AC power in your home has a measurable waveform, just like audio. Direct current doesn't have a waveform – it's a steady-on flow of electrons. In recorded audio (which, of course, is electricity at one point), unwanted DC manifests as this baseline shift, and it can create unexpected and unwanted sonic behavior.

3.5.2. Stereo Link

Your DAW's channel plug-in menu likely offers Bus PEAK and other audio plug-ins in stereo and dual mono versions. In Bus PEAK, the Stereo Link function governs how the plug-in processes two-channel audio.

It is continuously variable, outlined by these waypoints:

- *-100% (Dual Mono):* No modules are stereo-linked internally, instead processing each channel independently.
- *-50%:* Only the Bass Tone Control limiter is linked.
- *0% (Automatic):* The first Limiter stage is in automatic mode; Bass Tone Control limiter is linked.
- *+50%:* First Limiter stage and Bass Tone Control are linked; second Limiter stage, Treble Tone Control, and Clipper are not linked.
- *+100%: (Stereo Linked):* All modules except the Clipper are linked, which itself links at a Character [p.18] setting of 0 and is totally unlinked at a Character setting of 100%.

Intermediate values will bias Bus PEAK's decision-making towards dual mono processing at negative percentages, or stereo processing at positive ones.

3.5.3. Dither

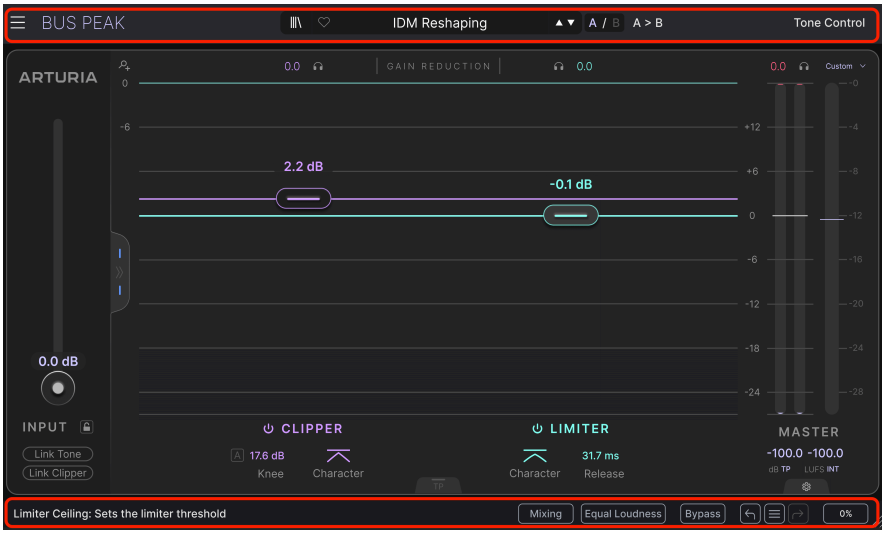
Dither is the practice of adding a small amount of noise to a digital signal to replace quantization errors. In musical terms, it makes the sound more natural. In earlier days of digital recording, it was essential to counter a quality listeners could perceive as harsh. Our ears don't experience dither as noise because the level is far too miniscule.

Today's home studio equipment is so good that many musicians have forgotten about dither, but engineers still use it at the final mixdown and mastering stages. Now as then, dither should only be used when bouncing a final mix to a lower bit depth and/or sample rate. Bus PEAK offers three settings here:

- *Off*
- *24-bit TPDF:* Use for bouncing to a 24-bit file
- *16-bit TPDF:* Use for bouncing to a 16-bit file

> TPDF stands for Triangular Probability Density Function, a form of dither that is especially good at avoiding unwanted artifacts in the sound.

4. THE TOOLBARS



The toolbars above and below the main control area of Bus PEAK contain a number of important functions for Preset selection, housekeeping, and other utility settings.

The Upper Toolbar includes:

- The Main Menu [p.27]
- The Preset Name Pane and Preset Browser [p.38]
- Switching and copy options for A and B settings [p.31]
- A button to open the Tone Control [p.31] panel

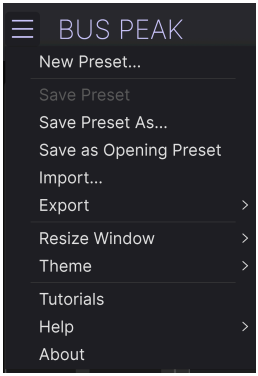
The Lower Toolbar includes:

- The parameter description area [p.32]
- Drop-down menu for audio processing quality [p.33]
- The Equal Loudness [p.33] function
- A Bypass button [p.34]
- Undo, Redo, and History [p.34]
- The CPU Meter [p.35] and Panic [p.35] functions
- A corner grab handle [p.35] for resizing the Bus PEAK window

4.1. Upper Toolbar

Let's start with the Upper Toolbar, covering its functions from left to right.

4.1.1. Main Menu



Clicking the "hamburger" icon (three horizontal lines) in the top left corner of the upper toolbar opens the Main Menu, a drop-down menu that lets you access a number of useful functions related to Preset management and more.

4.1.1.1. New Preset

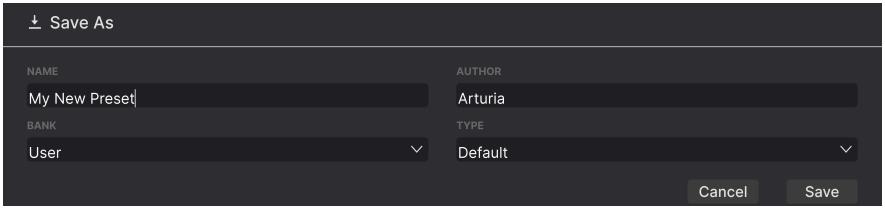
Creates a new Default Preset with initialized settings for all parameters.

4.1.1.2. Save Preset

Overwrites the current Preset with any changes you have made. This applies only to user presets, so this option is greyed out for factory presets.

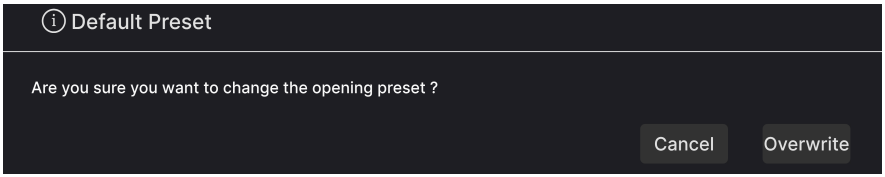
4.1.1.3. Save Preset As...

This option saves the current settings of Bus PEAK under a new Preset name in the User bank. (Factory Presets cannot be overwritten or lost.) Clicking this option reveals a window where you can name your Preset and enter more detailed information about it:



Information entered for the Bank, Author, and Type fields are all useful when searching for Presets in the Preset Browser [p.38]. You can also type a name into the Bank field, which will create a new user bank that will then be available in subsequent *Save As* operations. You can't write into the Factory bank, but you can create multiple user banks!

4.1.1.4. Save as Opening Preset



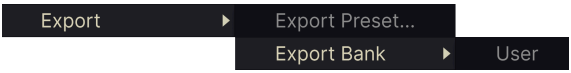
This option specifies the current Preset (Factory or User) as the one that will open when Bus PEAK is first placed on a track or bus in your DAW project. If you choose a factory Preset, it will open with factory settings.

4.1.1.5. Import...

This command lets you import a Preset file or entire Bank stored on your computer. It opens a navigation window in your computer's OS to find the proper files.

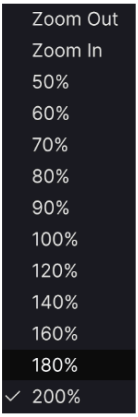
4.1.1.6. Export...

You can export Presets to your computer in two ways: as a single Preset, or as a Bank. In either case, an OS-level navigation window lets you specify where to save the file(s). Both individual Presets and Banks have the filename extension .BSPKX. By default, filenames include a time and date stamp.



- **Export Preset...:** Exporting a single Preset is handy for sharing a preset with someone else. The saved preset can be reloaded using the **Import** menu option.
- **Export Bank:** This option exports an entire Bank of Presets, which is useful for backing up or sharing many Presets at once. Saved Banks can be reloaded using the **Import** menu option.

4.1.1.7. Resize Window

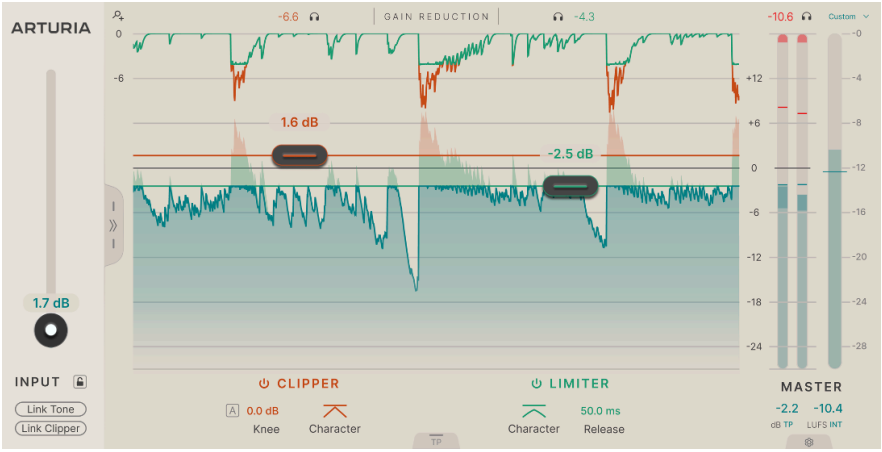


Bus PEAK can be resized from 50% to 200% of its default size (100%) without any visual artifacts. On a smaller screen, such as a laptop, you may want to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor, you can increase the size to get a better view of the controls and graphics.

You can also perform this operation using keyboard shortcuts: every time you press CTRL- (Windows) or CMD- (macOS), the window will shrink by one size increment, and every time you press CTRL+ (Windows) or CMD+ (macOS), the window will grow by one size increment.

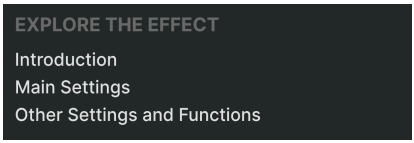
In addition, you can click-drag the resize handle [p.35] at the right of the lower toolbar to make the Bus PEAK window any size.

4.1.1.8. Theme



Bus PEAK's visual theme is dark by default, but if you prefer a brighter look, there is also a light theme. The background color changes, as do the colors of the visualizer, metering bars, and other controls.

4.1.1.9. Tutorials



Bus PEAK comes with interactive tutorials that walk you through different features of the plug-in. Clicking this option opens a pane on the right side of the window where the tutorials appear. Select one to access step-by-step descriptions that highlight the relevant controls and walk you through the process. Click "Exit Tutorials" at the bottom of this pane to end the tutorial and collapse the plug-in window to its previous size.

4.1.1.10. Help

Get more help by visiting links to this user manual and Frequently Asked Questions pages on Arturia's website. You will need an internet connection to access these pages.

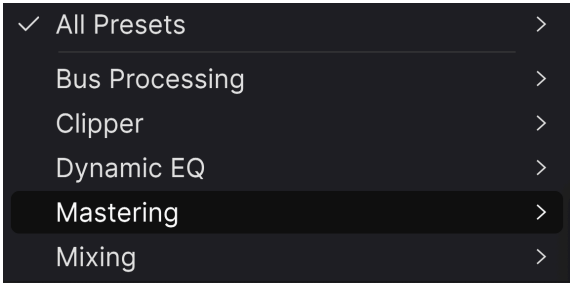
4.1.1.11. About

Here you can view the software version and developer credits. Click again anywhere on the screen (outside the About window but inside the plug-in) to make this pop-up window disappear.

4.1.2. Preset Browser access and Name Pane

The Preset Name Pane

Clicking the "books on a shelf" button opens the Preset Browser [p.38], which offers a myriad of ways to browse, sort, and organize Presets in Bus PEAK.



Clicking on the Preset name also opens up quick drop-down menus for selecting Presets outside of the Browser, as shown above. You can select to look at lists of Presets organized by purpose, as shown above, or look at All Presets at once.

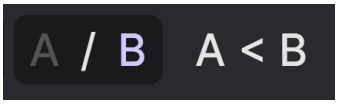
The categories/purposes on the left of the drop-down correspond to Subtypes [p.39], a specific level of Tag found in the Preset Browser.

Everything you need to know about managing Presets, is covered in detail in the next chapter [p.38]. This includes working with Favorites, which are tagged by clicking the heart icon you can see to the left of the Preset name.

Note: An asterisk just after the name in the Preset Name Pane (*) indicates that you've made changes to that Preset, even if you haven't saved them. If you want to keep them, be sure to do a *Save Preset As* operation and name your Preset.

4.1.3. Dual settings and copy

Preset state A active with the option to copy settings to B



Preset state B active with the option to copy settings to A

Each Preset is actually two Presets in one! Using the A and B buttons, you can switch between two completely different sets of control settings. These are saved within each Preset.

When A is active, clicking **A > B** will copy the A settings to B. When B is active, clicking **A < B** will copy the B settings to A.

! When you edit settings in a Preset and close your DAW project without saving the Preset, the changes will be remembered when you reopen it – but they will be recalled in Slot A. That means that editing settings in Slot B and closing your DAW without saving them will move those settings over to Slot A when you reopen the project – and Slot B will be blank. Save often!

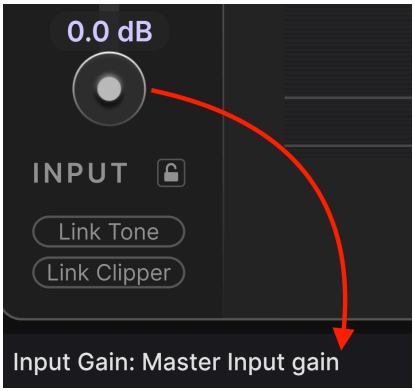
4.1.4. Tone Control button

At the upper right corner of the upper toolbar is a button that opens the Tone Controls [p.13] pane described in the previous chapter, performing the same function as the tab that opens this area on the main panel.

4.2. Lower Toolbar

The Lower Toolbar of the Bus PEAK interface can be thought of in terms of left and right halves. On the left is the parameter description display, and on the right are buttons for several useful utility functions.

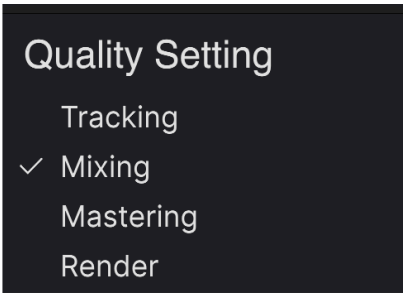
4.2.1. Parameter Descriptions



This Control Description pops up when you hover over the Input Gain slider

Operate or hover on any knob, button, icon, or other control, and a brief description of what it does appear in the lower left-hand corner.

4.2.2. Quality



Bus PEAK offers four tiers of quality in terms of the amount of oversampling it performs as well as other aspects of its internal audio resolution. In ascending order, these are:

- *Tracking:* Low-latency and CPU-efficient mode suitable for recording and composing while Bus PEAK is active in your DAW.
- *Mixing:* High-quality mode suitable for making mix decisions.
- *Mastering:* Higher-quality mode suitable for mastering sessions, at higher CPU cost.
- *Render:* Highest-quality mode but very CPU-intensive; suitable only for offline audio rendering/bouncing.

> Think of this as a "good-better-excellent-best" difference, and be aware that each higher tier uses considerably more CPU resources. The *Mastering* level is ideal for working on a stereo print of your mix. The *Render* level is truly no-compromise, and is best left for when you're not touching anything further in your project and only rendering final audio.

4.2.3. Equal Loudness

Equal Loudness auto-pads the processed signal to match the input loudness

Equal Loudness is an "auto-pad" that matches the processed output signal to the input loudness. It does this only if the output signal is louder. This process retains all the character added by Bus PEAK, but without increasing the overall signal, making it much easier to compare the original and processed signals.

> **WARNING**: The Equal Loudness function is intended as a check to be used in tandem with the Bypass button. With Equal Loudness engaged, toggle Bypass to hear the entirety of what Bus PEAK is doing, without volume changes that might bias your ears that either signal is "better." However, do NOT leave Equal Loudness on all the time or while rendering/bouncing, as it will track large loudness differences in the input (e.g. a break or bass drop) and potentially disrupt overall dynamics.

4.2.4. Bypass

The **Bypass** button bypasses the Bus PEAK plug-in entirely. Among its uses are doing a quick comparison of dry versus processed signal without having to bypass the plug-in at the DAW level.

4.2.5. Undo, Redo, and History

When editing a plug-in, it's all too easy to overshoot the sweet spot for one or more controls, and then wonder how to get back to where you were. Like all Arturia plug-ins, Bus PEAK offers comprehensive Undo, Redo, and History functions so that you always have a safe way back.

Use the arrows to go back and forward one control movement at a time.

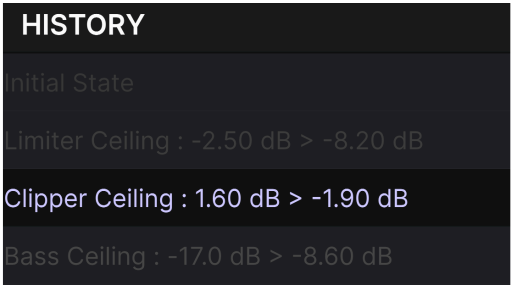
4.2.5.1. Undo

Click the left arrow to revert to the state before the most recent edit you made. You may click repeatedly to undo several edits in reverse time order.

4.2.5.2. Redo

Click the right arrow to redo the most recent edit you undid. If you have undone several, you may click repeatedly to redo them in forward time order.

4.2.5.3. History



Click the center "hamburger" (three lines) button to open the History window, as shown above. This provides a step-by-step account of every move you have made in Bus PEAK. Clicking on an item in the list not only re-executes that move – it returns the plug-in to the overall state it was in when you first made that move.

Note that the A and B controls settings within a Preset have separate Undo Histories.

4.2.6. CPU Meter

At far right is the **CPU Meter**, which displays the overall load Bus PEAK is placing in your computer CPU. Since it deals only with this plug-in, it is not a substitute for the resource metering tools in your DAW.

4.2.6.1. Panic

Mousing over the CPU Meter accesses the Panic button

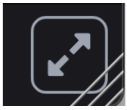
Mouse over the CPU Meter, and it will display the word PANIC. Click to send an all-sounds-off command that silences any sound processed through Bus PEAK. This is a momentary command, so sound will resume if your DAW is still playing.

In the event of serious runaway audio (say, from an unrelated delay effect that has gone into a feedback loop), stop your DAW playback and disable the plug-in causing the problem.

4.2.7. Resize handle

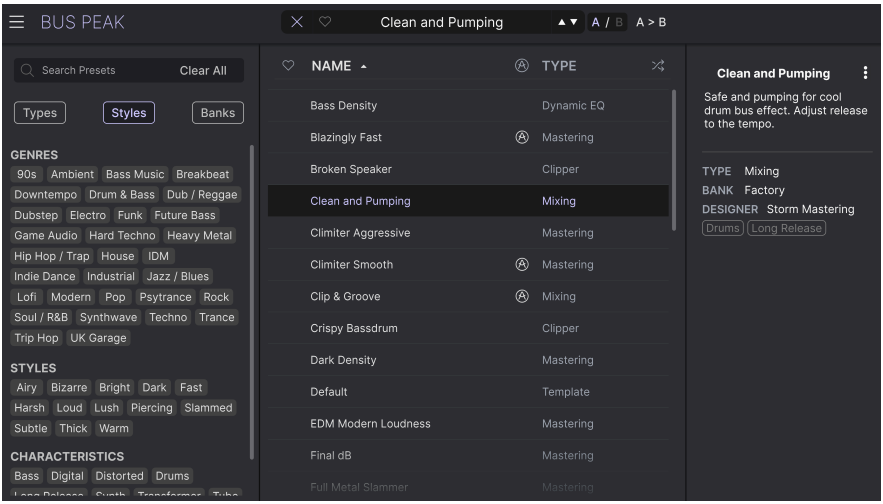
Grab and drag the diagonal lines to the right of the CPU meter to resize the plug-in window. When you release the mouse button, the window will snap to the nearest increment available in the Resize Window [p.29].

4.2.7.1. Max View button



Sometimes, you may see the above button with two diagonal arrows over the resize handle. This happens when, for some reason, the window size is not displaying all of the controls of Bus PEAK. Click it to restore a full view of the open controls.

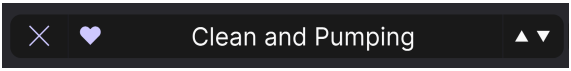
5. SELECTING PRESETS



Bus PEAK lets you browse, search, and select Presets from a browser-like interface inside the plug-in. You can also create and save your own Presets in the User Bank. Of course, the state of any instance of the plug-in – including the current Preset – is automatically saved when you save your DAW project, so you can always pick up where you left off.

First, we will cover Preset functions from the Upper Toolbar in more depth.

5.1. Preset Name Pane



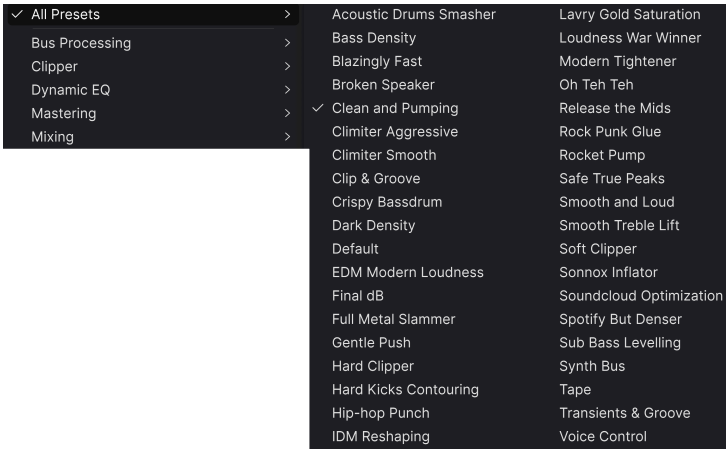
The name pane at top center is always displayed whether you're in the main controls view or the Preset Browser. It reads out the name of the current Preset, obviously, but also offers further ways to browse and load Presets. A filled-in heart icon indicates a liked Preset.

5.1.1. The Arrows

The up and down arrows to the right of the Preset name step serially through Presets. This is limited by the results of any currently active search, i.e. the arrows will only step through the search results. So, make sure any searches are cleared if you simply want to step through all available Presets until you find something you like.

5.1.2. Preset quick access

As mentioned briefly in the previous chapter, you can click on the Preset name in the center of the upper tool bar to bring up a drop-down Quick Browser for Presets. The first option in this menu is called All Presets, and it brings up a submenu of literally every Preset in the current Bank:



All presets

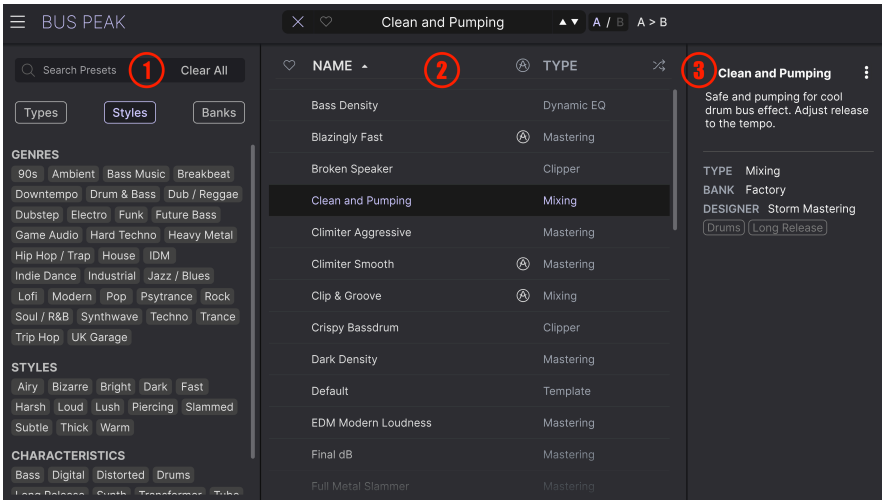
Below "All Presets" are category options for different applications: classic EQ, enhancer, etc. These correspond to the Subtypes [p.39] in the plug-in's library of Tags. Each of these brings up a submenu of Presets that are appropriate for the specified purpose. One useful aspect is that in the Tags area [p.39], which Subtypes are visible depends upon the parent Type selected. But in the above menu, all Subtypes are always displayed.

Unlike the up and down arrows, the "All Presets" submenu is independent of search criteria – it simply shows you every Preset available. Likewise for the choices below the line, which always include all Presets within that Type.

5.2. The Preset Browser

Click the "books on a shelf" icon (four vertical and tilted lines) in the Upper Toolbar to access the Preset Browser. When the Preset Browser is open, the icon becomes a large X, and is used to close the Browser when you're done.

The three main areas of the Preset Browser are as follows:

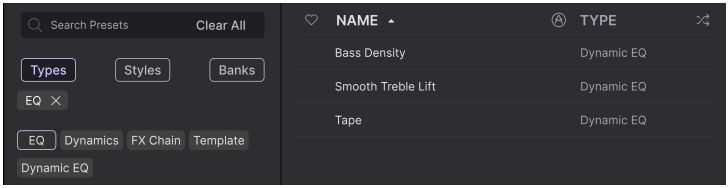


Number	Area	Description
1.	Search [p.39]	Searches for Presets by text entry with filters for Type, Style, and Bank.
2.	Results Pane [p.41]	Displays search results, or all Presets if no search criteria are active.
3.	Preset Info [p.43]	Displays Preset Details; can edit details for Presets in User Bank.

5.3. Searching Presets

Click on the Search field at the top left and enter any search term. The browser will filter your search in two ways: First, simply by matching letters in the Preset name. Second, If your search term is close to that of a Type or Style [p.39] it will include results fitting those tags as well.

The Results Pane will show all Presets that fit your search. Click the **Clear All** text to clear your search terms.

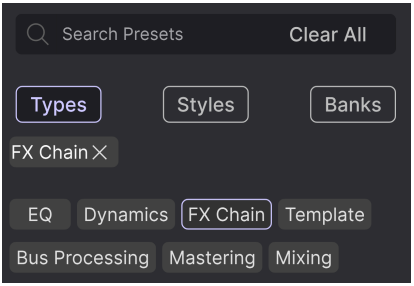


Filtering by the EQ type

5.3.1. Using Tags as a filter

You can narrow (and sometimes expand) your search using different *tags*. There are two kinds of tags: **Types** and **Styles**. You can filter by one, the other, or both.

5.3.1.1. Types and Subtypes



The main type, FX Chain, is in the upper row of tags; its subtypes are in the second row

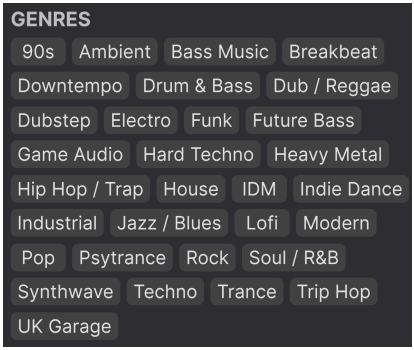
Types in Bus PEAK are applications: EQ, Dynamics, FX Chain, and Template are shown above, and so on. With a clear search bar, click the **Types** drop-down to bring up the list of types. Types sometimes include Subtypes. In the above example, FX Chain is the main Type, and the second row of Subtypes is Bus Processing, Mastering, and Mixing. The selected Type determines which Subtypes are displayed.

> You can specify the Type and Subtype when saving a Preset [p.27], using the contextual Type menu. That Preset will then show up in searches where you've selected that Type. The categories of Presets in the quick drop-down menu [p.37] correspond to Subtypes, i.e. specific purposes or musical goals for the plug-in's processing.

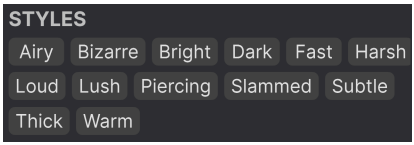
5.3.1.2. Styles

Styles are, well ... exactly that. Accessed by the **Styles** button, this area has three further subdivisions:

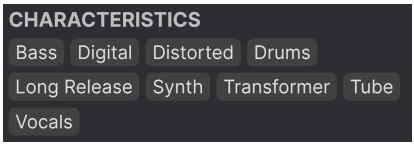
- *Genres*: Identifiable musical genres such as Ambient, Bass Music, Industrial, etc.:



- *Styles*: General "vibe" such as Bizarre, Lush, Slammed, etc.:



- *Characteristics*: Even more detailed audio qualities and target sonic characters such as Digital, Long Release, Transformer, and more:



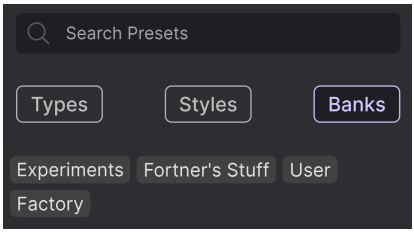
Click any tag in any of these categories, and the results will show only Presets that match that tag. Notice that when you select any tag, several other tags usually grey out and become unavailable. This is because the browser is *narrowing* your search by a process of elimination.

> Note that this is the opposite of how selecting multiple Types *broadens* your search.

Deselect any tag to remove it and widen the search without having to start all over again. You can also clear the tag by clicking the X to the right of its text, which appears at the top.

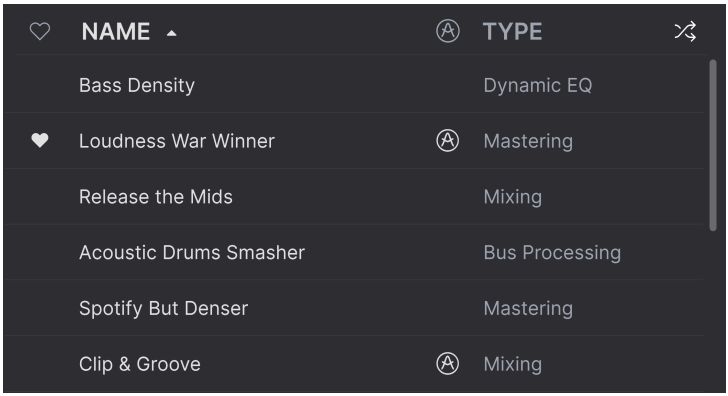
Note that you can search by a string of text, Types/Subtypes and Styles, or both, with the search becoming narrower as you enter more criteria. Clicking **Clear All** in the search bar will remove all Type and Style filters as well as any text entry.

5.3.2. Banks



To the right of the **Types** and **Styles** drop-downs is the **Banks** drop-down, which lets you do your search (using all the methods above) within the Factory or User Banks. When you perform a *Save Preset As* operation, you can type in a custom name in the Bank field. This will create a new User bank that will then be available in the menu the next time you *Save Preset As*. So you're not confined to a single, boringly named "user" bank.

5.4. The Results Pane



*The results of searching using the Style tag _Industrial_*

The central area of the browser shows search results, or simply a list of all Presets in the Bank if no search criteria are active. Simply click on a Preset name to load it.

5.4.1. Sorting Presets

Click the **NAME** header in first column of the Results list to sort the results list of Presets in ascending or descending alphabetical order.

Click the **TYPE** header in the second column to do the same thing by Type.

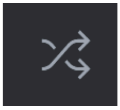
5.4.2. Liking Presets

As you explore and create Presets you can mark them as Liked by clicking the heart icon next to their names. This icon also appears in the Upper Toolbar's Preset Name Pane [p.36].

Clicking on the heart icon makes all of your liked Presets show up at the top of the results list, as shown here:

A filled-in heart icon indicates a Liked Preset. An outline indicates a Preset that has not yet been Liked. Click the heart at the top of the list again to return the list to its previous state.

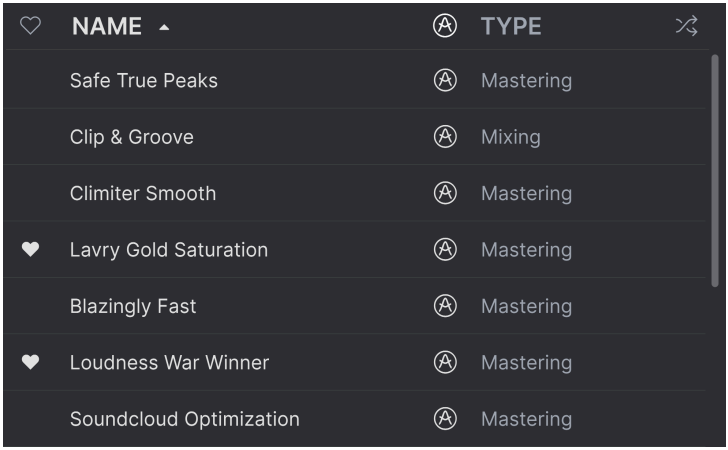
5.4.3. Shuffle button



This button randomly reorders the Preset list. Sometimes it can help you find the sound you're looking for more quickly than scrolling through the entire list.

5.4.4. Featured factory Presets

Presets accompanied by the Arturia logo are factory creations we think really showcase the capabilities of Bus PEAK.

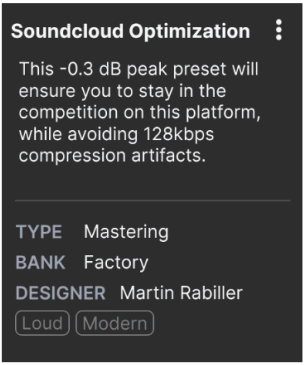


Clicking the Arturia logo icon at the top of the Results pane sorts all featured Presets to appear at the top of the list.

> Sorting by Liked presets takes priority over sorting by factory-featured ones. So, if the top heart icon is engaged, the results will show all liked Presets first, but the first among these will be featured Presets. Non-liked featured Presets may appear lower on the list.

5.5. Preset Info Section

The right side of the browser window shows specific information about each Preset.



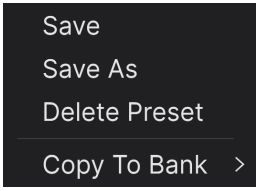
For Presets in a User bank (as the result of a *Save Preset As* operation), you can enter and edit the information in the Preset Info Section and it will update in real time. This includes the Bank, designer, Type, all Style tags, and even a custom text description at the top.

To make the desired changes, you can type directly in the text fields or use one of the pull-down menus to change the Bank or Type. As shown here, you can also use a hierarchical menu to select the Type or even create a new Type or Subtype.

Types and Styles changes you make here are reflected in searches. If you remove a given Style tag from a Preset and then save that Preset, it will not show up in future searches for Presets bearing that tag. Note that we provide a huge range of Types and Subtypes meant to work across the entire FX Collection. Not all of these apply straightforwardly to Bus PEAK.

5.5.1. Preset Info quick menu

Clicking the icon with three vertical dots brings up a quick menu for Save, Save As, and Delete Preset operations:



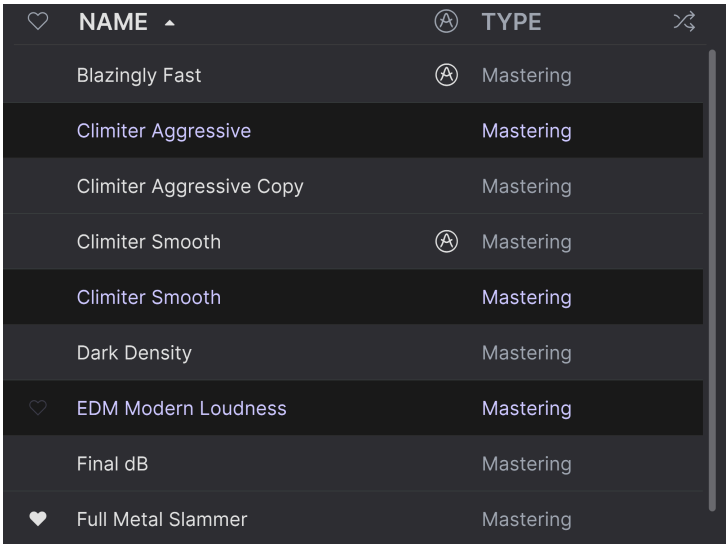
For sounds in Factory banks, only **Save As** and **Copy To Bank** are available. If you're working with a user Preset and "Save" is greyed-out, it means you haven't yet changed anything about the Preset.

5.5.2. Edit Style

You can also create your own Style tags to help refine searches according to criteria that matter most to you. Clicking on the + icon in the list in the Preset Info pane opens the Edit Style pane, where you can create as many new tags as you'll ever need:

5.5.3. Editing info for multiple Presets

It's easy to edit information such as Types, Styles, designer name, and text description for several presets at the same time. Simply hold CMD (macOS) or CTRL (Windows) and click the names of the Presets you want to change in the Results list. Then enter the comments, change the Bank or Type, etc., and save.



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