



# Audio Track

## User Guide



# Waves AudioTrack

## User Guide

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# Welcome

Thank you for choosing Waves! In order to get the most out of your Waves plugin, please take some time to read through this user guide. We also suggest that you become familiar with Waves Support at [www.waves.com/support](http://www.waves.com/support). There you will find an extensive answer base, the latest tech specs, detailed installation guides, new software updates, and current information on licensing and registration.

Sign up at the support site and you will receive personalized information about your registered products, reminders when updates are available, and information on your authorization status.

## Chapter 1: Introduction

### About AudioTrack

Waves AudioTrack combines an EQ, Gate, and Compressor in a single plugin. It combines CPU efficiency with great sound quality and it addresses the basic processing needs of any audio track, whether single-channel or multitrack audio stream. As a channel insert, AudioTrack functions like a mixing console's channel EQ and dynamics sections.

AudioTrack provides a clean audio path and high efficiency so that you can open multiple instances and avoid moving back and forth between separate equalizer, gate and compressor plugins.

When introduced, AudioTrack was the pioneer in multifunction channel strip plugins. AudioTrack is still the channel strip workhorse that it's always been, but for this new 25<sup>th</sup> Anniversary release, we've made a new, "easy on the eye" user interface, along with a few new features:

**Smoothing** Some older Waves plugins may introduce noise when a control is moved, including when controlled under automation. The Smooth feature resolves this issue.

**Double precision** AudioTrack now executes 32-bit, floating-point processing at 64 bits.

**Separate meters** Comp and Gate gain reduction have their own meters for greater clarity and focus.

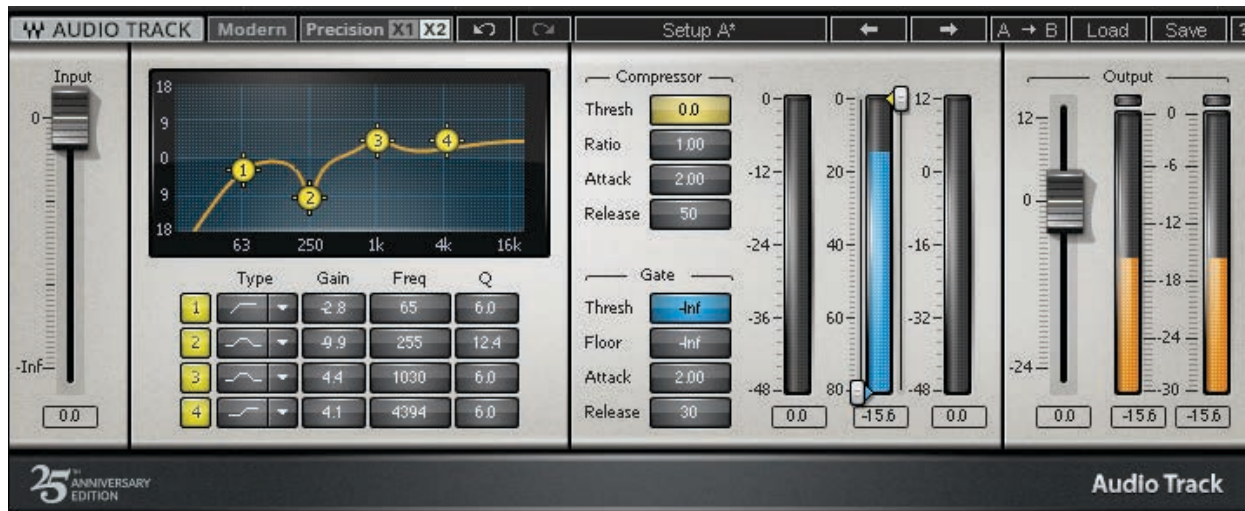
**Focused EQ band display** Only the selected band's parametric controls are displayed. This lets you to quickly understand and control band values.



AudioTrack can be used in its new modern view or in the classic view. Toggle between the two with the Modern/Legacy button on the WaveSystem Toolbar. Controls are very similar in the two modes.



Modern View



Legacy View



## AudioTrack Sections



EQ Section

Gate/Comp Section

### EQ Section

The AudioTrack four-band EQ can be controlled with both parametric and graphic controls. There are five filter types: Bell, Hi-Pass (Low-cut), Low-Shelf, High-Shelf, and Low-Pass (Hi-cut). Available types vary according to the band. Each band offers 18 dB of boost or cut with variable Q for bells, and a 12 dB-per-octave response for shelf or pass filters.



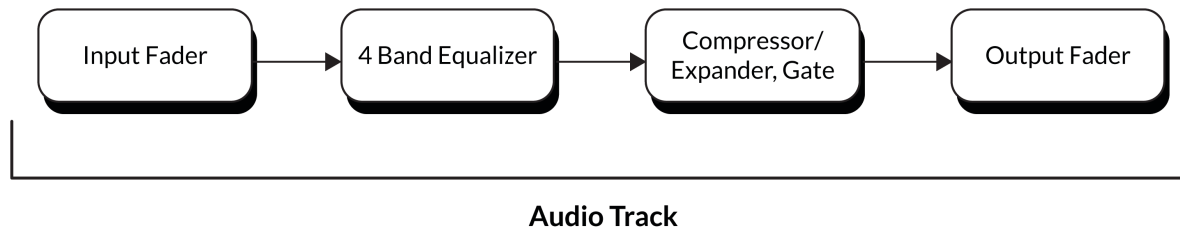
## Gate/Comp Section

The AudioTrack gate has dedicated Threshold, Floor, Attack, and Release controls to set the properties of the gain reduction applied to the audio. This lets you easily shut out noise or low-gain sounds while passing the higher gain or significant track sounds that are intended to be heard.

The AudioTrack compressor is a classic peak-reference compressor; it applies automatic gain compensation that usually appears as an increase in loudness. The compressor is equipped with traditional controls: Threshold, Ratio, Attack, and Release.

The AudioTrack plugin also has Input and Output gain controls to set the overall desired level for the track and avoid clipping.

## AudioTrack Signal Flow



## Components

There are two AudioTrack components: mono and stereo.



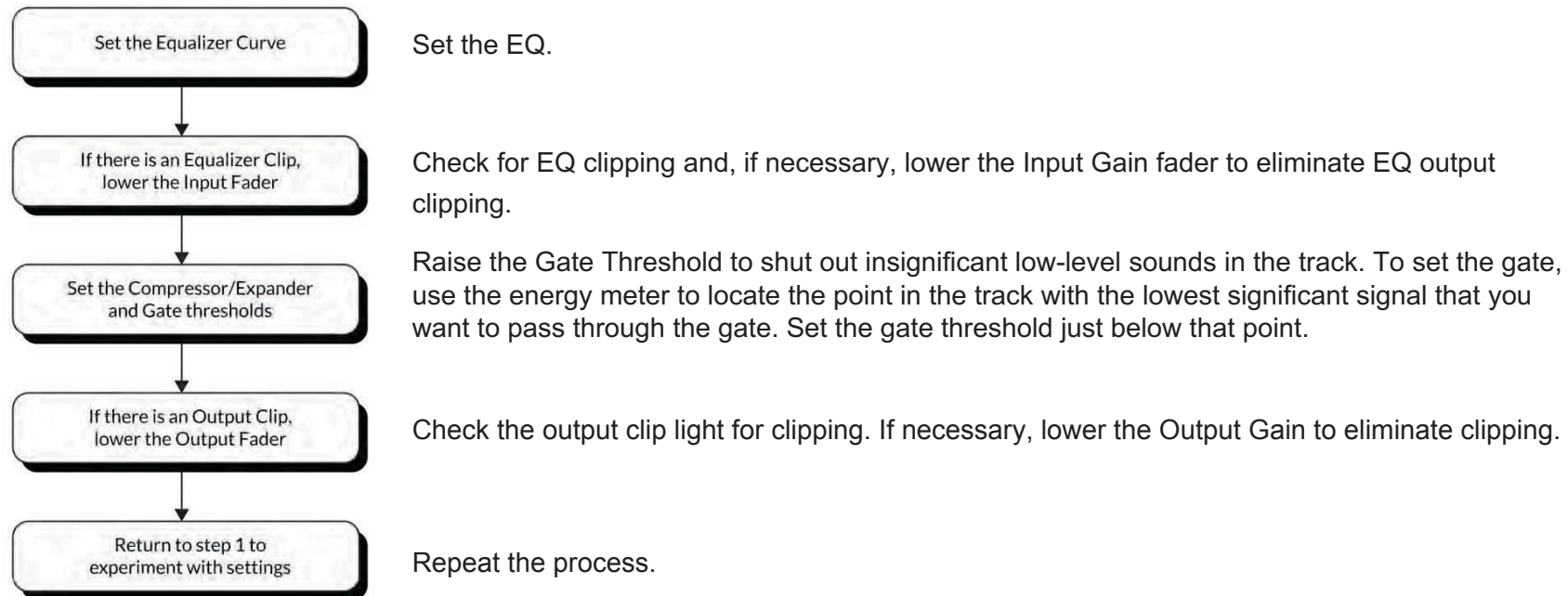
## Chapter 2: Using AudioTrack

If you're familiar with EQs and dynamics processors, you should be able to start using AudioTrack immediately. If you want some help with EQ and dynamics concepts or practices, the following sections will help you understand how AudioTrack works.

### Getting Started

We suggest that you start by inserting an AudioTrack preset and then adjust settings to suit your needs. There are many presets for multimedia audio processing and broadcast, plus several musical styles and more. You'll probably find a preset that makes for a good starting point. Fine tune factory presets, save them—or save your own presets—and manage them in the WaveSystem Toolbar. To learn how to best organize, compare, and exchange your presets, download the WaveSystem user guide from the Waves download page (<http://www.waves.com/downloads/manuals>).

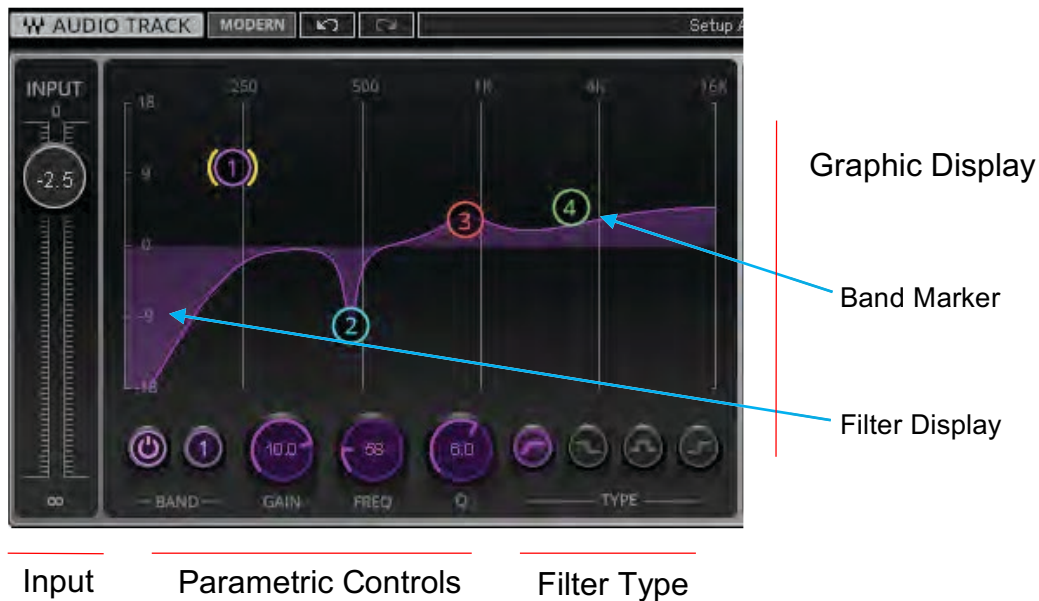
When you're getting started, we suggest that you follow this workflow.



We recommend that you repeat these steps in order to further tune your settings until you are satisfied with the results. The next section provides a detailed description of the workings of each section.

## AudioTrack EQ

The AudioTrack EQ section is a four-band parametric equalizer. It can be used to focus the spectral properties of a sound by bringing out or tucking in certain frequency ranges. The controls allow you to specify filter type, and adjust gain, frequency, and Q for each band.



Once a band is selected, you can adjust its parameters by dragging the band marker in the graphic display or by using the parametric controls. The parametric controls of the selected band are visible below the graphic display.





## Graphic Display

The graphical controls allow you to fully operate the controls using only the mouse or pointing device. This section is particularly useful when you want to adjust EQ parameters “on the fly.”

- Click on a band’s marker in the **Graphic Display**. This selects the band and displays the corresponding controls in the parametric section. Double-click on the selected band marker to turn the band on or off.
- Control EQ by dragging the band marker to the desired frequency on the X-axis, and boosting or cutting by dragging to the desired gain on the Y-axis.
- Hold Ctrl while dragging a marker to limit motion to one direction. This is useful when, for example, you have set the frequency and want to adjust the gain without changing the frequency.
- CMD(Ctrl)+Click on a marker to select a filter type.
- Use the keyboard arrows to adjust the frequency or gain of the selected marker. This is very useful for making precise adjustments.

### Parametric Controls Section

These controls are ideal for entering specific or predictable EQ values, such as when you construct harmonic filters.

- Use the leftmost button in the **Parametric Controls** section to turn a band on or off.
- Click on the Band ID number button to toggle through the four EQ bands. Once the band is selected, its parametric controls are seen and the corresponding band markers are displayed in the graphic display.
- Enter a frequency value directly in a selected value box using the numeric keypad. Drag vertically over the gain and Q value box, or horizontally over the frequency value box to change values. You can also use the keyboard arrows for fine adjustments.
- Four filter buttons represent the four band types: High-Pass (Low-cut), Low-Shelf, Bell, High-Shelf, Low-Pass (High-cut). Bands 2 and 3 do not have high- and low-pass filters.



Draw a box around several controls to link them together. This allows you to move band markers as a group, adjust frequency and Q simultaneously, control dynamics controls such as Gate and Floor, as a pair or streamline other multifunction actions.

## Filter Types

### Cut/Pass filters

To attenuate unwanted low-frequency audio such as rumbles, use the high-pass filter. To attenuate unwanted high-frequency disturbances such as hissing or screeching, use the low-pass filter.



The Pass/Cut filter type has a roll-off response of -12 dB per octave. The cutoff frequency represents the point where the roll-off is -3 dB.

The Q control does not affect Pass/Cut filter types.



## Shelf filters

Like the Pass/Cut filter, the Shelf filter can boost or cut above or below a specified frequency. Rather than rolling off to infinity, the shelf will roll off or up to the designated gain indicated in the shelf.



The Shelf filter's cutoff frequency is located in the middle of the slope. So if the specified frequency is 3000 Hz and the gain is set to +6dB, then the gain at 1000 Hz will be at about +3dB, as demonstrated here.

The Q control does not affect Shelf filter types.



## Bell filters



Bell filters boost or cut a certain frequency range. The indicated frequency is the peak of the bell filter, so this is the frequency that will get the most boost or cut of the filter. Bell filters can be wider or narrower according to the defined Q value.

For Bells, Q is a way to define the frequency width of the boosting or cutting Bell filters. It may be represented by the mathematical relationship:  $F_c/F_w$  (center frequency divided by frequency width at -3 dB point), both measured in Hertz.

In this example, a Q of 2.0 at 1,000 Hz reflects a bandwidth of 500 Hz (1000 Hz divided by 2). Low Q values yield the widest bells, which are good for enhancing a complete range similar to Hi Fi tone controls. High Q values offer the narrowest filters, which are useful for eliminating a specific problematic resonance.



## Filter Area

The affects of filters on a signal is indicated by the shaded area. It is color-coded to reflect the band that is currently being controlled.



## EQ Clipping



Adjust EQ gain with Input fader

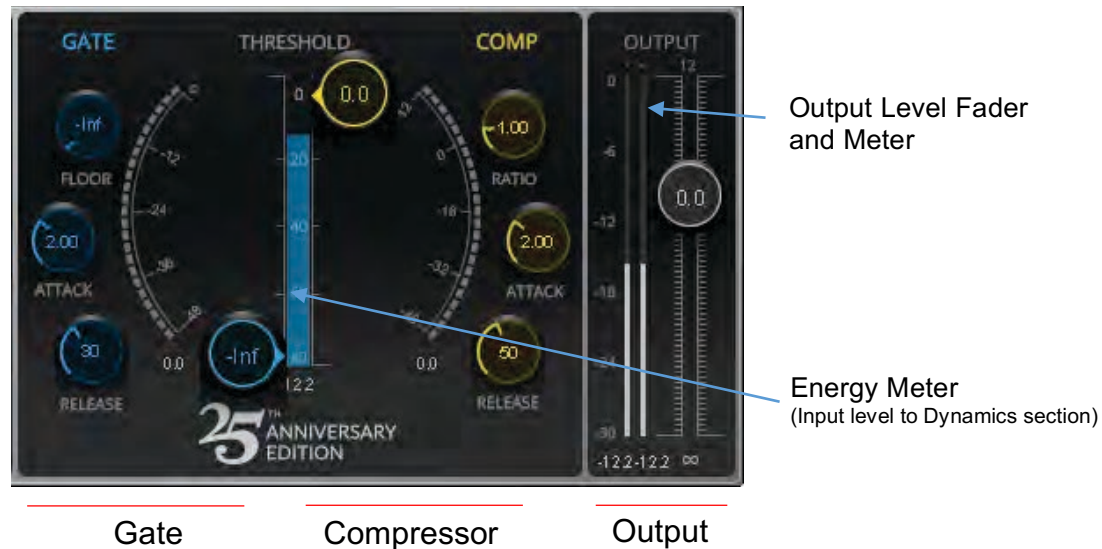
Energy Meter indicates level at EQ out / Dynamics in

If the input signal is particularly hot and it undergoes EQ processing, there is a chance that clipping at the EQ output may occur. While it's clear that increasing band gain in the EQ can result in clipping, in certain cases, *reducing* gain can *increase* EQ output, possibly resulting in a clipped signal as it enters the dynamics section. The Energy meter in the dynamics section displays the output level of the EQ.

If the EQ output level is too high, use the Input fader to adjust accordingly.



## AudioTrack Dynamics



AudioTrack offers two useful dynamics processors: a compressor/expander and a gate. The Gate and the Compressor each have gain reduction meters. The Energy meter shows the level of the input to the Dynamics section (i.e., the output of the EQ section). Final output level is set with the Output fader and meter.

### Compressor/Expander

The AudioTrack Compressor/Expander offers the traditional compressor controls: Threshold, Ratio, Attack, and Release. Together they let you define a set of conditions by which the track's gain will be adjusted dynamically.

Threshold sets the energy reference so that as long as the audio energy is significantly lower than the threshold, no gain adjustment will be introduced. When the energy approaches the threshold, the track gain will be adjusted according to the ratio specified. The attack and release time constants determine how quickly the gain adjustment will be applied. This is set in milliseconds.



Ratio values below 0.5:1 and 1:1 will result in gain boost (expansion); values between 1:1 and 40:1 will result in gain reduction (compression). When ratio is 1:1, no gain adjustment will take place. This is just like having the compressor in bypass. When the ratio increases to—for example—2:1, and the input energy exceeds the threshold by a certain number of dBs, it will be attenuated or reduced in gain so that the output energy exceeds the threshold by half of that amount.

The gain adjustment will reach its peak by the time specified in the attack constant. When the energy falls below the threshold, the attenuation will release according to the time specified in the Release control value.

The attack time is helpful in defining the compression texture. Short attack times will allow better peak control, while longer attacks will create a more “punchy” sound. Very short release times may sound grainy or distorted if overdone. Longer release times will likely sound smoother, but may “pump” with extreme settings. Long values for both attack and release can work as a leveling process, keeping the overall loudness to within the threshold area boundaries.

## Gate

The AudioTrack Gate attenuates the signal whenever its energy falls beneath the gate threshold. The gate will close within the time specified in the Release control and open according to the Attack time defined. Floor defines the maximum attenuation gain introduced to the signal.

When the energy drops beneath the threshold, the gate will close. In other words, gain attenuation will begin until it reaches the floor. This will take the amount of time specified in the Release control. When the energy rises above the threshold, the gate will open or attenuation will stop by the time specified in the Attack control.

The attack time should be fast enough that it does not create a fade-in effect every time the energy rises above the threshold. But sometimes, an attack that is too fast can result in a click sound.





## Chapter 3: Controls and Displays

### *Controls*

#### **INPUT GAIN**

The Input fader controls the input signal into the AudioTrack EQ. It is often useful to create headroom for peaking EQ filters that can quickly cause clipping to an already hot signal.



Range:  $-\infty$ –0.0 dBFS.  
Default: 0.0 dBFS



## EQ section (parametric controls)



### Band On/Off

Double-click on a marker to turn the band on or off.

Range: On or Off

Default: Off

### Band Selector

Click on a marker to select that band.

Default: Band 1

### Filter Type Selector

CMD+Click on a band marker to cycle through the four filter types.

Available filter types

Band 1: high pass, low shelf, bell, high shelf

Bands 2 and 3: low shelf, bell, high shelf

Band 4: low shelf, bell, high shelf, low pass

Default: Bell

### Band Gain Control

Band Gain sets the amount of boost or cut introduced to a band bell or shelf filter. For bells, gain corresponds to the selected frequency. In shelf filters, the gain value defines the overall boost or the gain at the shelf's cutoff frequency.

When the selected type is Pass/Cut filter, the gain setting has no significance.

Gain range: +/- 18 dB

Default: 0 dB



## Band Frequency Control

This control determines the frequency reference for the band.

- When the type is a bell, the frequency is the middle of the bell.
- When the type is shelf, the frequency is the middle of the shelf slope.
- When the type is Pass/Cut filter, the frequency is the -3 dB point of the rolloff.

Range: 16 Hz–1357Hz

Defaults: Band 1: 63 Hz; Band 2: 250 Hz; Band 3: 933 Hz; Band 4: 4000 Hz

## Q

Q is set for bell filters only and it defines their bandwidth (i.e. how wide or narrow a filter will be). The lower the value, the wider the filter and vice versa.

Range: 0.5–30

Default 6



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- When the type is a bell, the frequency is the middle of the bell.
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Range: 16 Hz–1357Hz

Defaults: Band 1: 63 Hz; Band 2: 250 Hz; Band 3: 933 Hz; Band 4: 4000 Hz

## Q

Q is set for bell filters only and it defines their bandwidth (i.e. how wide or narrow a filter will be). The lower the value, the wider the filter and vice versa.

Range: 0.5–30

Default 6



## EQ section (graphic controls)



### Band On/Off

Double-click on a marker to turn the band on or off.

Range: On or Off

Default: Off

### Band Selector

Click on a marker to select that band.

Default: Band 1

### Filter Type Selector

CMD+Click on a band marker to cycle through the four filter types.

Available filter types

Band 1: high pass, low shelf, bell, high shelf

Bands 2 and 3: low shelf, bell, high shelf

Band 4: low shelf, bell, high shelf, low pass

Default: Bell



### **Band Gain Control**

Move a marker vertically to change the gain of a band's bell or shelf filter. For bells, gain corresponds with the selected frequency. In shelf filters, the gain value defines the overall boost or the gain at the shelf's cutoff frequency.

When the selected type is Pass/Cut filter, the gain setting has no significance.

Range: +/- 18 dB

Default: 0 dB

### **Band Frequency Control**

Move a marker horizontally to change the frequency reference for the band.

Range: 16 Hz–21,357 Hz

Defaults: Band 1: 63 Hz; Band 2: 250 Hz; Band 3: 993 Hz; Band 4: 4000 Hz

### **Q**

Hold OPT/Alt while dragging horizontally to change the Q value. This modifier lets you move very quickly between Frequency and Q.

Range: 0.5–30

Default 6



## Comp/Expander section.



### Threshold

The Threshold setting is a point of energy reference. When the signal is significantly below the threshold, no compression is introduced. As the energy approaches or passes the threshold, gain adjustment will begin, according to the values in the other controls. Compressor threshold is set with the yellow control in the center part of the section.

Range: -55 dBFS–0 dBFS

Default 0 dBFS

### Ratio

Ratio defines how the gain will be adjusted as the threshold is approached. Expansion ratios are 0.5–1 and compression ratios are 1–40. For example, setting a ratio of 2:1 means that when the input energy exceeds the threshold by a certain amount of dBs, it will be attenuated or reduced in gain so that the output energy will exceed the threshold by half of that amount.

Range: 0.5:1 (expansion): 1:40 (compression)

Default 1:1



### **Attack**

Attack time determines how long it will take for the gain adjustment to reach its target. For example, when energy goes over threshold by 4 dB and the ratio is 2:1, gain attenuation will take 2 ms to lower the gain by 2 dB. Shorter attack times provide better peak control, while longer attack times can provide better “punch.”

Range: 0.1–1000 ms

Default: 2.0 ms

### **Release**

The release value sets the time it will take for the gain adjustment to return to 0 when the energy falls below the threshold.

Range: 1ms –10000ms

Default: 30 ms

### **Compressor Gain Reduction Meter**

Indicates gain reduction for the Compressor section.

Range: -48 dB–+12 dB





## Gate section



### Threshold

The threshold is a point of energy reference, so that when the energy drops beneath the threshold, the gate will close or the track gain will be attenuated according to the values in the other controls. The Gate threshold is set with the blue control in the center of the section.

Range: 0 dB to  $-\text{Inf}$

Default:  $-\text{Infinity}$

### Floor

Floor defines the maximum amount of gain attenuation that the gate will apply when closing. It prevents the gate from attenuating all way to “silence.” This can make for a smoother sound.

Range:  $-\text{Infinity}$  – 0 dB

Default:  $-\text{Infinity}$



**Attack**

Determines the time the gate takes to open when energy goes over the threshold.

Range: 0.1 ms–1000 ms

Default 2.0 ms

**Release:**

Release sets the time it takes for the gate to close.

Range: 1 ms – 10000 ms

Default: 30 ms

**Output**

This control sets the overall output gain. It can be used to prevent output clipping.

Range: -24 dB – 12 dB

Default: 0 dB



## Displays

### EQ Graph



The EQ graph shows the total EQ gain curve derived from the four bands. It shows  $\pm 18$  dB on the Y-axis and 16 Hz – 16000 Hz on the logarithmically scaled X-axis. The graph shows numbered band markers that can also serve as controls on the graph

### Energy and gain reduction meters



The Energy meter is located in the middle of the section. It reflects the post-EQ signal that enters the Gate/Comp section.

Range: -80 dBFS – 0 dBFS

Peak level is shown at bottom of the meter. Click anywhere on the meter to reset.

The yellow Comp meter (right) indicates the gain change caused by the Compressor.

Range: -48 dB – 12 dB

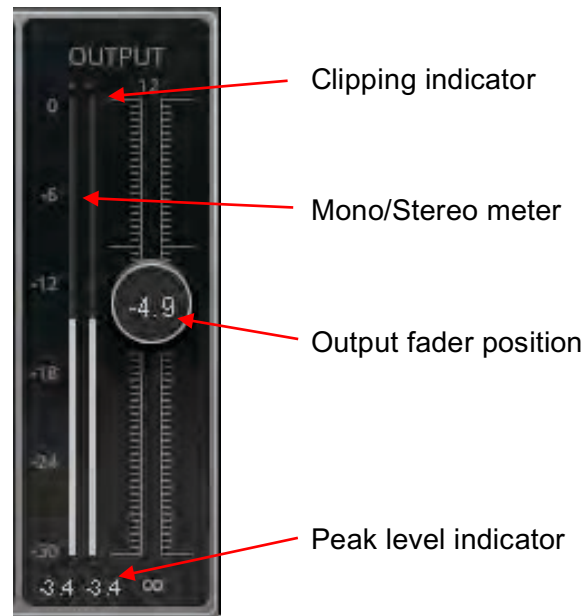
The Gate meter (left) indicates the gain reduction resulting from the gate process.

Range: -48 dB – 12 dB



## Output Meters and Clip Indicators

The Output meters display the plugin output level, post-EQ and post-dynamics.



Click anywhere on the meter to clear peak and clip indicators.

Range: -30 dBFS – 0 dBFS.

