



&



Selig Gain

User Guide

Version 1.0



Table of Contents

Selig Gain	3
Quick Start	4
Overview	4
Features	4
The Front Panel	5
Signal Indicator	5
Mute/Fade	6
Input Meter	6
Mode	6
VCA Mode	6
Trim Mode	6
Pan Law	6
Pan Left/Right	7
Polarity Invert (∅)	7
Mono	7
Peak Hold Reset	7
Peak Hold Auto	7
Peak Hold Display	7
Output Meter	8
The Back Panel	8
Main Audio Input	8
Main CV Input	8
Main Audio Output	8

Main CV Output	9
CV Control Inputs	9
CV Control Outputs	9
Applications	9
Use It on Audio:	10
Use It on CVs:	10
Included Combinators	10
1-Auto Panner	10
2-Ducker	11
3-Crossfader	11
4-Independent L/R Control	11
5-Mega-Gain Booster	11
6-VCA Master Fader	12
7-CV Warping Toolkit	12
8-Fake 3D Rotation	12
9-CV Convert Uni2Bi and Bi2Uni	13
Appendix	13
Pan Laws Graphs:	13
MIDI CC Chart:	15
Credits	16

Selig Gain



Thank you for your purchase of the Selig Gain! This handy device addresses common gain related issues from precisely setting levels to creative applications. The more you use it, the more uses you'll find for it!

Quick Start

For those who just need to get straight to work, insert Selig Gain where ever you need to adjust or measure audio levels. Trim mode provides ± 24 dB gain whereas VCA mode features a -infinity to 0 dB "fader". The Peak Hold meter shows you the highest peak level that occurred in either channel since it was reset. Auto Reset will automatically reset the meter after 3 seconds, or immediately whenever the Fader is moved.

Overview

Selig Gain is a simple Rack Extension for gain control of audio and CV signals. It functions as a classic VCA, or as a handy volume control complete with Peak Hold meter, mute, and panning. Use it to measure and adjust levels anywhere in your signal path. Also included: mono, polarity invert, and independent left/right pan controls with selectable pan law, and of course there is full CV I/O on the back panel. Think of it as a portable gain stage for Reason's Rack - use it anywhere you like!

Features

- Gain Stage for audio and CV signals, with front panel fader and back panel CV control.
- Two fader modes, VCA and Trim. VCA mode is unipolar, and ranges from unity gain down to "off". Trim is bipolar and gives you ± 24 dB of gain with 0.1 dB precision.
- Independent pan knobs for left and right channels.
- Pan laws: 0 dB linear, -3 dB linear, cosine and square root, -4.5 dB linear, cosine and square root, - 6 dB linear and cosine.
- Additional features include a mono function, polarity invert, and a Peak Hold meter with Auto Reset option.
- Auto Reset mode enables the Peak Hold display to update when the Fader is moved up *or* down, for more precise control.
- Ultra low CPU hit, use Selig Gain freely throughout your song file!

- Bonus features: the Fader and Pan functions include CV outputs that correspond to the current front panel mode. The Fader CV will be unipolar in VCA mode, and bipolar in Trim mode, while the Pan CV outputs provide a signal that corresponds to the selected pan law. Inverted outputs are provided.

- Most parameters can be viewed and controlled while the device is folded for minimal rack intrusion.



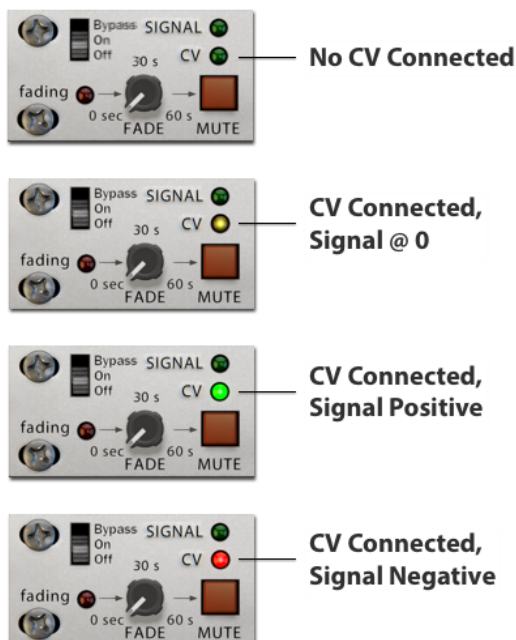
The Front Panel



There are five sections on the front panel: Mute/Fade, Fader, Pan, Mono/Polarity, and Peak Hold. The order of the sections corresponds to the signal flow through the device, from left to right.

Signal Indicator

The signal indicator shows signal presence for both audio and cv inputs for quick indication of proper routing. The Audio Signal LED shows level with intensity, getting brighter when the input gets louder. The CV LED shows bipolar signals with positive values in green, getting brighter with higher values, and negative values in red, getting brighter with lower values. When there is a CV cable connected but there is no CV activity, the LED will be a dim yellow.



Mute/Fade

This section is really just a mute button, but it has one special feature - you can control how “fast” the signal is muted. By using fade times of 20-30 seconds or more you can create classic SSL “Auto Fade” fade outs. At it’s fastest setting there is still a short fade in/out that matches the Mute button in the SSL for consistency.

Input Meter

High resolution peak reading input meter for both left and right channels. Represents the level of the signal present at the back panel input jacks, prior to any processing.

Mode

Selects between VCA and Trim Mode (see below)

VCA Mode

In this mode the fader acts like an attenuator, allowing you to fade out from unity gain (no change) to silence, without any amplification. At the top/right of the fader travel is unity gain, in the center position there is -24 dB gain, and below/left of that there is a smooth taper down to silence.

Trim Mode

In this mode the fader is bipolar, with ± 24 dB at either end and 0 dB (unity gain) in the center.

Pan Law

Selects from the following pan laws:

0 dB Lin, -3 dB Lin, -3 dB Cos, -3 dB Sqr, -4.5 dB Lin, -4.5 dB Cos, -4.5 dB Sqr, -6 dB Lin, and -6 dB Cos. The decibel amount described how far down the level is in the center position for each side, while the curve (linear, cosine, square root) describes the path taken to reach the center amount.

Duplicate or redundant curves were omitted, so there's not always three curve options for every dB amount. Plots of the Pan Law curves can be found in the Appendix.

Pan Left/Right

Each stereo channel has a dedicated pan knob allowing change of width or angle, or reverse the panning entirely. The range is from -100 to +100 with 0 being center.

Polarity Invert (Ø)

Inverts the polarity of both the audio and the CV signal.

Mono

Sums the left and right channel to mono, subtracting 6 dB to maintain proper levels, and splits the mono signal to both left and right outputs equally.

Peak Hold Reset

Provides a manual reset of the Peak Hold meter when held down.

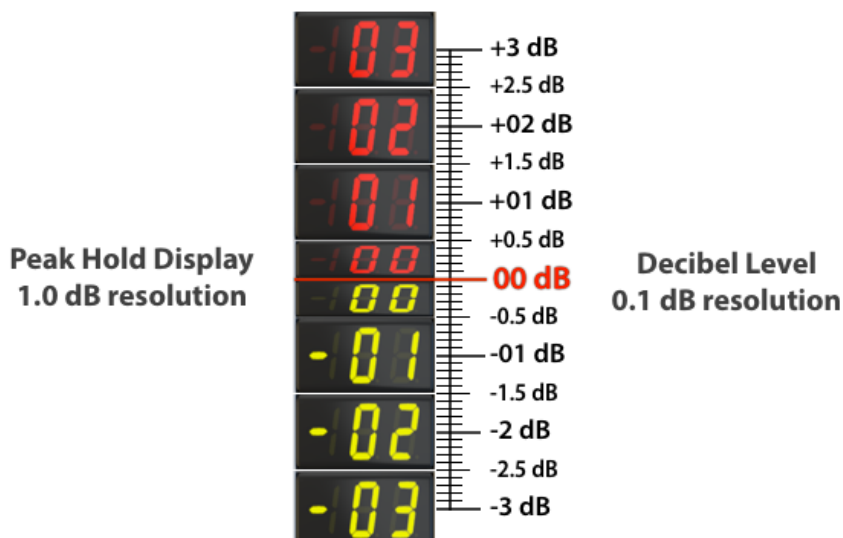
Peak Hold Auto

When enabled, the Peak Hold meter is automatically reset if after 3 seconds the measured peak value has not changed. In addition, whenever the fader or pan controls are moved, the Peak Hold display will reset. This aids in setting precise levels as changes are quickly displayed without having to wait 3 seconds for the display to automatically reset.

Peak Hold Display

This LED style display shows the decibel level rounded to the nearest dB. This is not intended as a high resolution mastering meter. The meter displays the measured decibel level after rounding to the nearest integer. Therefore the true value will lie within ± 0.5 dB of the displayed value. For example, if the meter says the level is - 12 dBFS, the actual level could be as high as - 11.5 dBFS or as low as 12.5 dBFS.

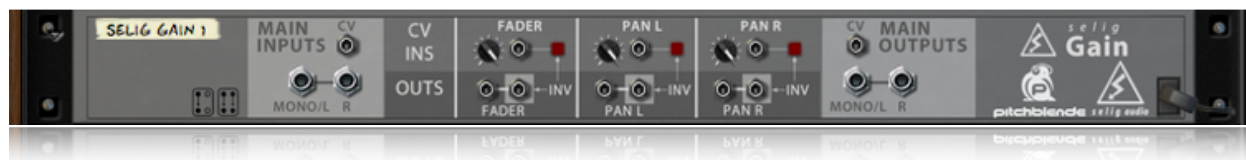
As an aid to more precise level setting around the clipping point of 0 dBFS, the Peak Hold Display has two color values for "0 dBFS"; the value is yellow "00" when between -0.5 and less than 0 dBFS, red "00" when between 0 dBFS and 0.5 dBFS. Additionally, since you know that the display changes at 0.5 dB between the actual value, you can use the fader to find the exact place and then either add or subtract 0.5 dB from the fader position to hit the true value. This issue won't come up for most, so I provide this information for those who like to know the finer "behind the scenes" details.



Output Meter

High resolution peak reading output meter for both left and right channels. Represents the level of the output signal present on the back panel jacks.

The Back Panel



Here you will find the input and outputs for Gain. Separate Audio and CV I/O are provided. CV inputs for Fader and Pan controls with invert button, plus CV outputs for the same are provided here.

Main Audio Input

All audio signals enter Selig Gain on these jacks. Stereo inputs are provided, although Gain can operate in mono by using the Left input only.

Main CV Input

The signal for CV processing enters here.

Main Audio Output

These are the main stereo outputs. Use the Left jack only for mono operation.

Main CV Output

This is the output for the CV processing path.

CV Control Inputs

These are provided for advanced CV routing applications. All three CV inputs have independent CV Trim knobs and Polarity Invert buttons.

Fader CV Input:

0-127 values linearly modulate the Fader position. In other words, if the Fader is at the bottom/left and you provide a CV value of 64 to this input, the result will be the same as if you moved the fader to the mid point. A value of 127 would be equivalent to the fader being all the way up/right. The actual gain will depend on what mode you are in.

IMPORTANT: CV control of gain is NOT clamped, and therefore using positive CV values can result in a VERY loud signal. This is highly desirable for creative applications, but can catch you off guard if you're not prepared for this possibility! Reasonable precautions, such as lowering the speaker/headphones levels when experimenting with CV control of gain is suggested.

Pan L/R CV Input:

0-127 values will linearly modulate the Pan knob positions. For a knob positioned hard left, a value of 64 will result as if the knob was positioned at its mid point. A value of 127 will result as if the knob was hard right. Unlike gain, internal Pan values *are* clamped to the pan limits.

CV Control Outputs

Fader Out/INV Out

This provides a CV value determined by the actual position of the Fader. Far left = 0, middle = 64, far right = 127. This can be used to generate a CV value for a number of applications, such as driving parameters beyond their front panel control limits, or using it to control other Gain devices to create VCA style fader groups.

Pan Out/INV Out

These provide a signal derived from the currently selected Pan Law curve. These signals are unipolar. The hard left/right positions will always be either 0 or 127, with the Pan Law affecting the shape of the curve between these points. By using a Combinator to control the front panel knob via CV, you can transform linear CV values to various curve shapes depending on the pan law. For example, the "0 dB Lin" setting can create controls that do nothing for 50% of their travel, and traverse 0-127 for the rest of their travel and can therefore cause a Combinator knob to have the same effect on a CV source.

Applications

Use It on Audio:

- As a master volume/mute control and peak meter for your Combinator instruments.
- To measure and control peak levels anywhere in the signal path.
- As an insert for the SSL to add peak metering to any channel, and to explore mixing with different pan laws.
- As a Peak Hold meter to make sure all your channels are peaking around -12 dBFS (or the reference level of your choice). To this end, the LED meter's numerals turns from green to yellow from -11 dBFS to -1 dBFS, and to red from 0 dBFS and above.
- To create ducking, tremolo and auto-panning effects by using CV inputs or automation (see the included Combinators for examples).
- As a level "booster" to drive distortion or compression effects harder (or softer) and to expand the range of many devices.
- In the Master Insert for a quick mono check and to trim levels if necessary.
- To invert signal polarity at any point in the signal path, especially useful inside a Combinator.

Use It on CVs:

- As a "depth" control (which can be automated or modulated by a second CV), or to automate a mute on a CV signal, or to invert the CV signal.
- To generate CV values by using the Fader CV output, generating unipolar CVs in VCA mode and bipolar CVs in Trim mode.
- To generate CV curves based on the current pan law via the Pan L or Pan R CV outs.

Included Combinators

1-Auto Panner

Going beyond simple auto-panning, this Combinator device provides multiple pan curves to choose from. The LFO defaults to a sine wave, further shaping the curve (switch it to triangle

on the Pulveriser/LFO to follow the pan laws exactly). You can also choose a smoothed square wave for a more extreme panning effect. The Rate can be free or tempo synced, and there is a Depth control to set the overall width of the panning effect. This device pans mono or stereo input signals, but obviously makes any stereo signal into a panned mono signal since both pan knobs move exactly the same way.

There are 4 versions of this Combinator that showcase the range of panning curves and effects possible with this device: AutoPanner Light, AutoPanner Basic, AutoPanner Wide, and AutoPanner Hard.

2-Ducker

This is a classic ducking device - the instrument to be ducked, typically bass or a synth pad, is run through the main inputs of the Combinator. The trigger, or side chain source is patched into the first device in the Combinator, labeled "Side Chain In". By default, the input is patched into these jacks - you are replacing them with the external side chain source. Click on button 2 to listen to the side chain input. An input level of around -12 dBFS (as measured on the "Side Chain In" Gain device) is perfect. Adjust the Output for a similar level of around -12 dBFS as measured on the "Output Gain" device.

In addition to ducking, this Combinator can do some cool tricks when there's no external side chain input (the default setting). Running drums through this Combinator can get it to act like a super aggressive compressor, with negative gain enough to create "hole puncher" compression effects! The default is a 100% mix of the ducked signal, but you can disable that for a 50/50 mix - use the Output knob to You also have a Look Ahead option so you don't get a transient spike when using extreme ducking depths, which allows some interesting effects with fast attack/release settings (cranking the Output up accordingly).

3-Crossfader

This is a simple but effective crossfader Combinator that provides different crossfade curves from the Pan Law selection. Use the main inputs for input "A", and the second set of Gain devices labeled "Left B" and "Right B" for the "B" inputs. Rotary 1 crossfades between "A" and "B". Rotary 2 selects the crossfade shape/pan law.

4-Independent L/R Control

This is simply two Selig Gain devices running in mono, one for the left and one for the right. This setup allows you to quickly make changes to only one channel, like trimming the level of one channel or inverting polarity.

5-Mega-Gain Booster

This Combinator uses Selig Gain's own CV output from the fader to drive the input of the gain stage to get more than the 24 dB of boost normally allowed. In VCA mode you can get up to 48 dB of total gain (24 dB additional), and in trim mode you can get 72 dB of total gain (48 dB additional above the 24 dB of gain already available in Trim Mode)!

Be careful with this setup as 72 dB of gain is a powerful thing! Use this technique to intentionally overdrive compression and distortion/saturation devices beyond their intended ranges! You don't have to use Gain with the Combinator for this trick, it's just the only way to preserve a CV routing.

6-VCA Master Fader

There are two versions of this Combinator, TRIM and VCA depending on which fader mode is used. They are both designed to be used as a starting point for creating VCA style fader groups in the SSL mixer in Reason. Here's how they work. They each have 16 Selig Gain "Fader" devices hooked up via CV. To use, drag any Selig Gain "Fader" device into the insert of each channel you wish to include in the group. If there are other devices in the insert, put the Selig Gain last. It's best to use the default routing setting where the Channel Inserts are Post Dynamics/EQ to prevent gain changes from Selig Gain from affecting compressor/gate settings. Select all added devices and use Auto-route Device from the Edit Menu (or right-click) to automatically connect all necessary audio cables.

You still use your Channel Faders to set levels as you normally would, and you don't have to do anything to the individual channel Gain devices as they work behind the scenes. To bring all channels up or down in level together, simply adjust the Master Fader in the Combinator or use Rotary 1 on the Combinator front panel (you won't be able to see the dB scale when using the Combinator Rotary). Each Combinator also has a Mute Group button to mute all members of the group, and a Bypass button to ignore any group master fader changes.

The only difference between the two versions is the gain ranges differ. With VCA mode you won't have any positive gain available above unity gain, but you will be able to fade all channels out to silence, while Trim mode gives you ± 24 dB gain - choose the version that works best for you.

7-CV Warping Toolkit

This is an experimental Combinator showing how to use the Pan Law in Selig Gain to reshape or 'warp' a CV signal. It is best used on linear signals like triangle or sawtooth, since the shapes tend to add curvature. There are unipolar and bipolar versions of the Combinator to choose from to match your source CV.

Inside the Combinator there are Gain devices labeled as CV In and CV Out - use these to connect to the outside CV world. Each Combinator comes with a CV generator (Pulveriser), and when using your own source you will need to disconnect these devices.

The Front panel is very simple - you can choose the Warp Type (pan law), choose x2 which uses both pan sections in series, and that's about it. But the variations, some more subtle than others, are potentially useful.

8-Fake 3D Rotation

This is an effect I was taught years ago on an analog console, but the concept is the same. You rotate the pan knob as you raise and lower the fader, producing a sound that appears to fly by

you then go off in the distance to circle around and do another fly by. Doppler was added to increase realism.

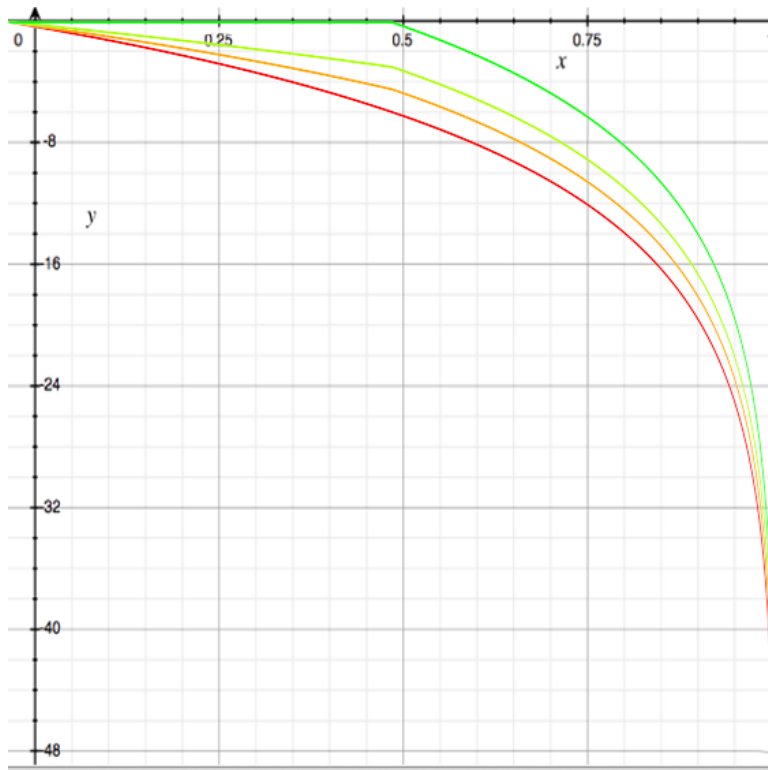
9-CV Convert Uni2Bi and Bi2Uni

These are two Combinators used as container to show how to use Selig Gain on CVs to perform common unipolar to bipolar and bipolar to unipolar conversions. You can drag the two Selig Gain devices outside the Combinator as there are no Combinator controls used.

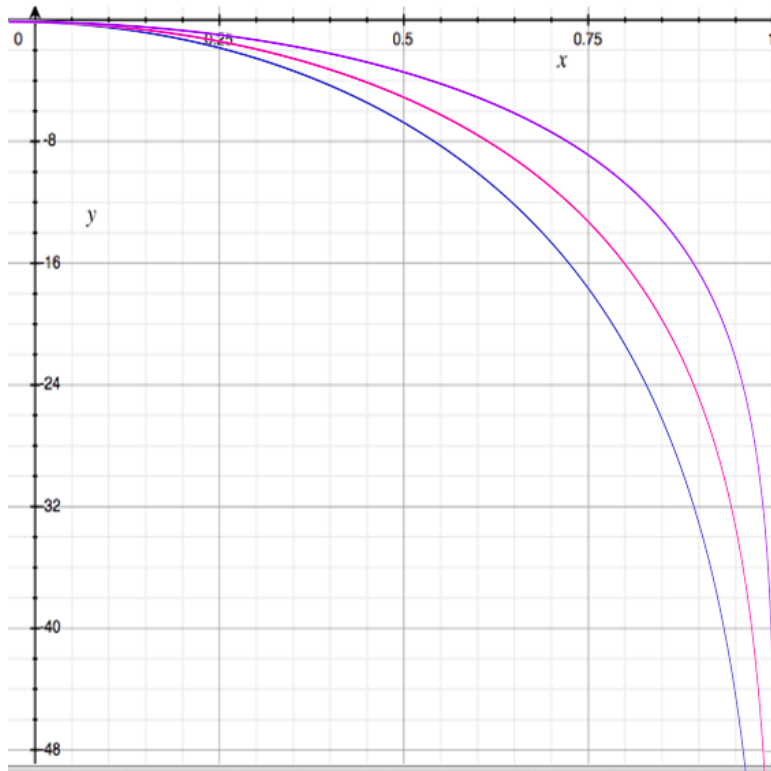
Appendix

Pan Laws Graphs:

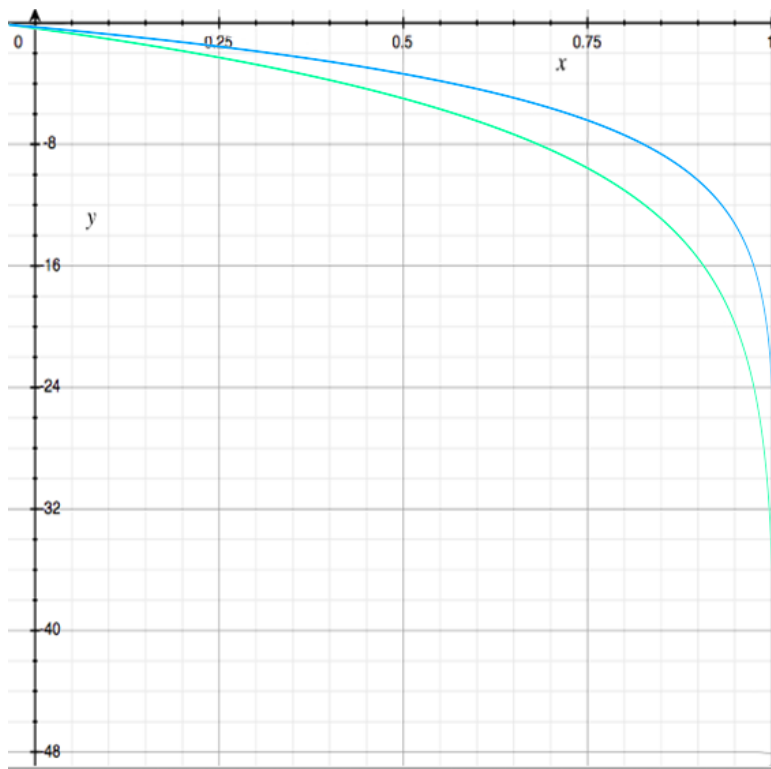
Linear Pan Laws; 0 db, -3 dB, -4.5 dB, and -6 dB center:



Cosine Pan Laws; -3 dB, -4.5 dB, -6 dB center:



Square Root Pan Laws; -3 dB, -4.5 dB center:



MIDI CC Chart:

[12] = "mute",
[13] = "mode",
[14] = "gain vca",
[15] = "gain trim",
[16] = "pan law",
[17] = "pan left",
[18] = "pan right",
[19] = "polarity invert",
[20] = "mono",
[21] = "peak hold reset",
[22] = "peak hold auto",
[23] = "fade time",

Credits

Selig Gain

Concept by:
Giles Reaves

Crafted by:
David Antliff, for Pitchblende Ltd.
Giles Reaves, for Selig Audio, LLC.

Many thanks to all the dedicated beta testers!

Selig Gain © 2014 Selig Audio, LLC, all rights reserved.



selig audio

Selig Audio, LLC

Sandy, UT, USA.

Email: contact@seligaudio.com

Web: seligaudio.com

Facebook: [SeligAudio](https://www.facebook.com/SeligAudio)

Parts of the Selig Gain are used under license:
Copyright © 2014 Pitchblende Ltd, all rights reserved.



Pitchblende Limited

Wellington, New Zealand.

Email: contact@pitchblende.co.nz

Web: pitchblende.co.nz

Twitter: [@PitchblendeLtd](https://twitter.com/PitchblendeLtd)

Facebook: [PitchblendeLtd](https://www.facebook.com/PitchblendeLtd)

