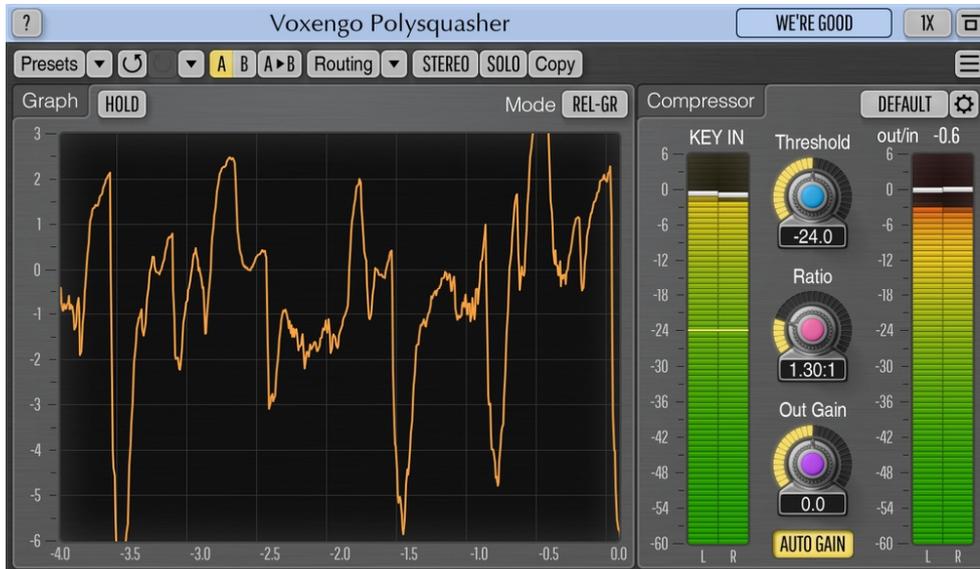


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# Voxengo Polysquasher User Guide



Version 3.5

<https://www.voxengo.com/product/psquasher/>

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## Introduction

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Voxengo Polysquasher is a mastering compressor plug-in for professional sound and music production applications. Polysquasher was designed with a main goal: to be transparent. Transparent compression action is a cornerstone for any mastering compressor. Transparency of audio signal processing is necessary to preserve all existing elements in the mix, while compression itself is necessary to make the mix sound uniform to other mixes (tracks) and to make it sound more solid and “glued”.

Polysquasher achieves its goal by using a unique compression algorithm which requires a small number of parameters – basically threshold and ratio only – making this compressor a joy to use. More advanced settings are hidden in the “compressor mode editor” panel where you can create your own compressor modes that can be easily recalled later.

Polysquasher is best used as a finishing compressor inserted in the chain before the final mastering limiter.

Polysquasher also features real-time gain reduction and waveform graphs. Full multi-channel operation is supported.

## Features

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- Transparent compression sound
- Real-time Relative gain-reduction graph
- 6 built-in compressor modes
- Compressor mode editor
- Stereo and multi-channel processing
- Internal channel routing
- Channel grouping
- Mid/side processing
- Up to 8x oversampling
- 64-bit floating point processing
- Preset manager
- Undo/redo history
- A/B comparisons
- Contextual hint messages
- All sample rates support
- 22 ms compensated processing latency

## Compatibility

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This audio plug-in can be loaded into any audio host application that conforms to the AAX, AudioUnit, VST, or VST3 plug-in specification.

This plug-in is compatible with Windows (32- and 64-bit Windows XP, Vista, 7, 8, 10 and later versions, if not announced otherwise) and macOS (10.11 and later versions, if not announced otherwise, 64-bit Intel and Apple Silicon processor-based) computers (2.5 GHz dual-core or faster processor with at least 4 GB of system RAM required). A separate binary distribution file is available for each target computer platform and audio plug-in specification.

## User Interface Elements

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**Note:** All Voxengo plug-ins feature a highly consistent user interface. Most interface elements (buttons, labels) located at the top of the user interface are the same in all Voxengo plug-ins. For an in-depth description of these and other standard features, and user interface elements, please refer to the “Voxengo Primary User Guide”.

### Graph

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This frame displays real-time graph that represents compressor’s operation. You may switch between “R-GR” (Relative gain reduction) graph that displays gain-reduction function applied to the input signal, and “Wave” graph which displays input and output waveform graphs, overlaid (note that overlay color is represented by a combination of input and output’s graph colors). The gain-reduction graph is displayed relative to 2-second average: thus, it does not reflect constant gain reduction values. Look at the “out/in” indicator to see the average/constant gain change taking place.

With the help of these graphs, you may evaluate how “deep” the compressor goes in its operation.

You may enable the “Hold” switch to freeze the graph display temporarily for closer inspection purposes.

### Compressor Parameters (“Comp”)

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This frame contains parameters that affect compression.

The mode selector allows you to switch between various built-in compressor modes and your own preset modes. The “Edit” button opens the “Compressor Mode Editor” popup window that offers you a thorough control over the compressor mode.

The “Threshold” parameter specifies compression threshold (dB relative full-scale). Input signal louder than this threshold level will be compressed. The value of the “Threshold” parameter is reflected on the “In” level meter.

The “Ratio” parameter specifies “input-to-output” compression ratio. “3.0 : 1.0” means increase of input signal above compression threshold by 3.0 decibel will result in increase of output signal by only 1.0 decibel.

The “Out Gain” parameter adjusts overall output signal level (decibel). Note that in order to retain original input signal’s sonic qualities Polysquasher does not contain an output DC blocking (high-pass) filter which is usually required in compressors due to the fact compression introduces minor DC offset. For best results it is suggested to use a suitable DC filter after Polysquasher in chain – like the one found in Voxengo Elephant mastering limiter. However, as the DC offset introduced by Polysquasher is usually very small you may not even need to worry about it.

The “Auto Gain” switch enables an additional makeup gain adjustment that depends on the compressor parameters.

## Compressor Mode Editor

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This popup window gives you means of deep compression algorithm tuning. This window contains several parameter blocks that affect specific aspects of the compression algorithm.

By the way, you may wonder why a weird name for a plugin – Polysquasher? It is due to its unique algorithm: it is a feedback compression algorithm which utilizes an array (hence “poly”) of compressors (“squashers”), usually more than 10 of them working at the same time.

### Dynamics

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The “Attack” parameter specifies compressor’s attack time (in milliseconds).

The “Inertia” parameter adjusts release stage’s inertia, the “slowness” of the release stage (in percent). Note that Polysquasher has no exact release time parameter, in this sense the plugin has automatic release behavior.

The “Atk” switch selects attack phase’s shape.

The “Rls” switch selects release phase’s shape.

The “Knee” parameter specifies transfer function’s knee (in decibel) centered around compressor threshold level. Values above 0 dB resemble “soft knee” compression.

The “Dry Mix” parameter specifies the amount of original unprocessed “dry” signal sent to output (in percent).

### Level Detector

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Level detector parameters control the way loudness of multi-channel input signal is estimated. Polysquasher uses peak level detection.

The “Ch. Link” parameter specifies the power of linking between channels in the channel group (expressed in percent). 0% means channels are fully unlinked.

The “Lookahead” parameter controls the length of look-ahead buffering (in milliseconds). Values above zero allow compressor to react on input peaks “in time” and thus behave a little more “precise”.

The “Hi Slope” parameter specifies magnitude of gradual (linear) spectrum slope change from low to high frequencies (in decibel per octave). Higher values allow you to force compressor to overreact to a higher frequency content thus preserving the lower frequency content better. This is a kind of pre-emphasis filtering which allows you to obtain a “silky” top end without over-compressing the lower frequencies. Increasing the slope also helps at reducing “ducking” artifact caused by short and

loud low-frequency sounds. The “Hi Slope” switch should be enabled for the slope to be applied.

## Credits

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DSP algorithms, internal signal routing code, user interface layout by Aleksey Vaneev.

Graphics user interface code by Vladimir Stolytko. Graphics elements by Vladimir Stolytko and Scott Kane.

This plug-in is implemented in multi-platform C++ code form and uses “zlib” compression library (written by Jean-loup Gailly and Mark Adler), “LZ4” compression library by Yann Collet, “base64” code by Jouni Malinen, FFT algorithm by Takuya Ooura, filter design equations by Robert Bristow-Johnson, VST plug-in technology by Steinberg, AudioUnit plug-in SDK by Apple, Inc., AAX plug-in SDK by Avid Technology, Inc., Intel IPP and run-time library by Intel Corporation (used under the corresponding licenses granted by these parties).

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## Questions and Answers

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**Q. I'm wondering what release values Polysquasher use?**

**A.** Polysquasher has no defined release value in a common sense. Due to its design the release time depends on the program material and the mode used. However, the "Inertia" parameter defined in the "Compressor Mode Editor" affects an effective release time to some degree.

**Q. I've noticed that when using Polysquasher in MS mode, mid and side channels are processed as groups, completely individually. Is there a way to link them (and vary an amount of linking)?**

**A.** By default, the "Mid-Side Stereo" preset assigns mid and side channels to different groups, thus forcing unlinked operation. After loading the "Mid-Side Stereo" routing preset please change the group assignment of the channel "B" to group "1" in order to link the channels.

**Happy Mastering!**