



# Voxengo HarmoniEQ User Guide



Software version 2.2

<http://www.voxengo.com/>

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## Introduction

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HarmoniEQ is a parametric, harmonically-enhanced equalizer plug-in for professional music production applications. Harmonic enhancement HarmoniEQ applies to the sound is an inherent element of its overall sonic quality. HarmoniEQ also features dynamic equalization modes that offer you a vast palette of sound-shaping capabilities, suitable for mastering.

Since the easiness of tuning was one of our goals when producing this plug-in, HarmoniEQ features a single control surface to control the equalizer curve. HarmoniEQ's control surface workflow implements our best findings in the area of “user-equalizer” interaction. Just drag the filter control points to the right places. You can enable up to 7 parametric filters, with the filter type freely-selectable from peaking, low-shelf, high-shelf, low-pass, high-pass and notch filter types.

Another useful element of HarmoniEQ is its control surface's frequency range which goes up to 38 kHz. Such extended range allows you to make smooth “air” boosts easily. While HarmoniEQ is best suited for EQ boosts, its EQ cuts also sound great.

## Features

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- Harmonically-enhanced equalizer
- Dynamic equalizing
- Real-time spectrum analysis
- 7 parametric filter bands
- Narrow-band sweeping
- 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
- 11 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 AudioUnit or VST plug-in specification.

This plug-in is compatible with Windows (32- and 64-bit Windows 7, Vista, XP) and Mac OS X (10.5 and later versions, 32- and 64-bit, Intel processor-based) computers (2 GHz dual-core or faster processor with at least 1 GB of system RAM required). A separate binary distribution file is available for each target computer platform for each audio plug-in specification.

## User Interface Elements

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Note: Most interface elements (buttons, labels) located on the top of the user interface and on the bottom are standard among all Voxengo plug-ins and do not require much learning effort. For an in-depth description of these and other standard user interface elements and features please refer to the “Voxengo Primary User Guide”. Learned once it will allow you to feel comfortable with all pro audio plug-ins from Voxengo.

### Equalizer

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This panel displays parametric equalizer’s control surface. Please refer to the “Voxengo Primary User Guide” for in-depth information about this control surface’s functions.

The “Range” selector allows you to set the accessible range of EQ gain adjustments.

The “Hold” switch allows you to hold spectrum updates temporarily for the purpose of visual comparison. Note that spectrum updates will be automatically resumed whenever you switch between channel groups.

The “Underlay” selector allows you to add an additional underlying EQ curve and spectrum (in a specified color) from another channel group of the current plug-in instance.

The “Spec” selector allows you to select and edit spectrum’s display mode. Please refer to the “Voxengo Primary User Guide” for in-depth information about spectrum mode settings.

The “Dyn” selector specifies dynamics mode (Extreme/Hard/Soft variants offer a range of differing “strength of effect” of the modes):

- The “Off” mode disables all dynamics.
- The “Exp Extreme/Hard/Soft” modes enable “expanding” dynamics. In this mode an EQ boost will result in a slight overall level boost of all transients thus empowering these transients. This mode produces “expanded” dynamic range sound.
- The “Comp Extreme/Hard/Soft” modes enable “compressing” dynamics. In this mode an EQ boost will result in a slight overall level cut of all transients thus compressing these transients. This mode produces “tight” dynamic range sound. Note that the signal’s original dynamic range will not be compressed: only the surplus loudness produced due to equalizing gets compressed.

Dynamics modes of HarmoniEQ should not be compared to those of GlissEQ – they use a completely different approach. Dynamics implemented in HarmoniEQ give its equalizer very unique characteristics and benefits. When you are using “expanding” dynamics modes you do not need to use large EQ boosts since any EQ boost you do is “amplified” by the dynamics. Moreover, since dynamics are processed in a broadband manner, any EQ boost produces a broadband loudness boost thus producing a much less hollow sound while allowing you to achieve a required sonic coloration. The “compressing” dynamics modes offer you a quite different benefit:

they allow you to apply EQ coloration without increasing peak levels thus reducing general EQ harshness.

It is important to note that EQ cuts in the “expanding” modes produce a compressed dynamic range. While EQ cuts in the “compressing” modes produce an expanded dynamic range. The descriptions of dynamics modes given above are based on EQ changes performed by a single filter. So, if you are using intermix of EQ boosts and cuts, the actual dynamical behavior will depend on what prevails – EQ boost or EQ cut.

Also note that dynamics modes are processed in channel-linked manner – if you want input channels to be processed completely independently please load the “Dual Mono” routing preset.

The “Hrm” selector specifies strength of harmonic coloration, from “Very Hard” to “Clean”. Note that harmonic coloration HarmoniEQ produces mainly comprises of 2<sup>nd</sup> and 3<sup>rd</sup> harmonics, with 3<sup>rd</sup> harmonic at a low level. Harmonic coloration takes place only after at least a single filter was enabled. Harmonic enhancement's subjective qualities of HarmoniEQ are different to those of GlissEQ's harmonically-enhanced filter type. Beside that, HarmoniEQ has selectable “strength” of harmonic coloration while GlissEQ offers harmonic coloration of a fixed strength per filter.

HarmoniEQ features the following filter types:

- Peaking – peaking (parametric) filter.
- Lo-shelf, Hi-shelf – low-shelving and high-shelving filters with dynamic behavior.
- Lo-pass 12, Hi-pass 12, Lo-pass 24, Hi-pass 24 – low-pass and high-pass filters with the specified slope in decibels per octave. These filters are not dynamic. The “bandwidth” affects transition band of these filters. The filter's slope is fixed: for example, you can't use the “bandwidth” parameter to turn the 24 dB/oct filter into the 48 dB/oct one – you have to use two 24 dB/oct filters to get the 48 dB/oct slope. The optimal bandwidth for these filters is around 1.9 – it provides minimal transition band without resonance boost appearing.
- Notch – band-rejection filter: filters out a narrow spectral area completely (minus infinity gain at center frequency).
- Bandpass – a standard band-pass filter. This filter type is usually used for “telephone line” sound effects. This filter can be also used for monitoring of a narrow spectral band.

Note that for best results it is suggested to use a suitable DC filter after HarmoniEQ in chain – like the one found in Voxengo Elephant mastering limiter. This may be required, because HarmoniEQ does not apply any additional output DC offset filtering while its harmonically-enhanced filters may add a slight DC offset due to their non-linearity. On the other hand, DC offset added by HarmoniEQ is usually very small and will not cause problems, so an additional DC offset filter may not be required at all.

## Output

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The “In Gain” parameter (in decibel) controls the input signal's level. Since HarmoniEQ's filters produce harmonic coloration, the amount of this coloration greatly depends on the loudness of the input signal. Thus the “In Gain” parameter

gives you control over strength of harmonic coloration. Note that you may use the right mouse button to adjust the “In Gain” parameter together with the “Out Gain” parameter, in the inversely-linked manner.

The “Out Gain” parameter (in decibel) changes overall output signal level of the plugin.

## Credits

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This plug-in was produced by Aleksey Vaneev in Syktyvkar, Komi Republic, Russia.

DSP algorithms and internal signal routing code were created by Aleksey Vaneev.

Graphics user interface code and the “standard” graphics design were created by Vladimir Stolypko.

Plug-in is implemented in multi-platform C++ code form and uses “zlib” compression library (written by Jean-loup Gailly and Mark Adler), filter design equations by Magnus Jonsson and Robert Bristow-Johnson, FFT code by Takuya Ooura, VST plug-in technology by Steinberg, AudioUnit plug-in SDK by Apple, Inc. (used under the corresponding licenses granted by these parties).

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## Beta-Testers

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