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# Voxengo Voxformer User Guide



Version 2.23

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

## **Contents**

Introduction 3

    Features 3

    Compatibility 4

User Interface Elements 5

    Overview 5

    Equalizer 5

    Dynamics 5

    Gate 6

    De-esser 6

    Presence 6

    Saturator 7

    In/Out 7

Mode Editors 9

    Compressor Mode Editor 9

    Gate Mode Editor 10

    De-esser Mode Editor 11

    Presence Mode Editor 11

Credits 12

    Beta-Testers 12

Questions and Answers 13

## Introduction

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Voxformer is a multi-functional vocal channel strip plug-in for professional audio applications. Combining several professional quality processing modules, Voxformer was designed to be a comprehensive solution for all your vocal processing needs – be it spoken or sung vocals.

The coolest feature of Voxformer is its one-knob vocal compressor. Using only a single knob, you can get a tight, open, and definitive professional vocal sound with an excellent articulation instantly. You do not have to worry about common ratio and make-up gain controls since they are automatically selected by the advanced compression algorithm, while the attack and release parameters are stored in a mode preset. Moreover, Voxformer features two compressors of this type, allowing you to apply either a two-band or a two-stage (serial) vocal compression.

Voxformer also features the de-esser with selectable center frequency and threshold. Multi-band noise gate is available, which, in a manner similar to the compressor, was designed to bring ease of tuning while providing excellent sonic results. For those who like a saturated vocal sound, Voxformer implements a special module which applies a smooth saturation. Another useful feature Voxformer has to offer is the presence boosting module which you can use to add some shine and space to the vocals.

As a finishing touch, Voxformer offers you a flexible easy-to-use 5-band parametric equalizer (pre/post selectable) with a real-time fast Fourier transform (FFT) frequency spectrum analyzer display. In most cases, Voxformer can be used for processing of a wide range of instruments beside vocals.

## Features

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- Two built-in vocal compressors
- Two-band compressor operation
- Asymmetric compression
- 5-band parametric equalizer
- Real-time FFT spectrum analyzer
- Noise gate (de-breath) module
- De-esser module
- Presence boosting module
- Saturation module with 4 modes
- Internal signals monitoring
- 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
- Zero 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”.

### Overview

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Since Voxformer was designed to be a maximally straight-forward and easy to set up audio processing plug-in, all modules are controlled by one or two parameters only. Other parameters of a module can be set by loading a mode preset. Any given module can be deeply customized by means of a corresponding “mode editor”. Mode customizations can be stored in user presets.

Voxformer features a set of audio processing modules chained to each other in the following sequence:

```
INPUT> EQ (Pre)> Gate> Crossover> De-esser (Pre)> Comp 1 & Comp 2>
De-esser (Post)> Presence> Saturator> EQ (Post)> OUTPUT.
```

Each module can be enabled with the corresponding enable switch.

### Equalizer

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For an in-depth description of the equalizer and spectrum analyzer and its settings please refer to the “Voxengo Primary User Guide”.

The “Off/Pre/Post” switch changes the position of the equalizer within the module chain. The “Off” setting disables the equalizer completely.

### Dynamics

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The “Comp 1” and “Comp 2” parameters control the amount of compression of Compressor 1 and Compressor 2, respectively. These knobs can be adjusted simultaneously with the right mouse button.

The “X-Over” parameter specifies the crossover frequency between the spectral parts which get compressed by the Compressor 1 and Compressor 2. Crossover availability is predefined in the compressor mode preset. If crossover is not enabled, the compressors operate in sequence.

The “Gain 2” controls the gain of the Compressor 2.

The following predefined modes are available for selection:

- The “Vocals” mode enables standard vocal compression mode.
- The “Serial” mode enables serial double compression.
- The “2-band” mode enables crossover filter and two-band compression.
- The modes with the “Asym” suffix use a slight DC biasing to produce “asymmetric” compression behavior which is aimed at producing elements of tube compression sound.

- The “Drums” mode is a demonstration mode designed for drum compression.
- The “El. Guitar” mode is a demonstration mode designed for electric guitar compression, with a reduced snap.
- The “El. Bass” mode is a demonstration mode designed for electric bass compression, with a high snap.

## Gate

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The “Gate” parameter specifies the threshold of the noise gate module. Signal that falls below this threshold will be muted.

The following predefined gating modes are available:

- The “De-breath” mode is designed for general vocal gating, including breath reduction. This mode is most remarkable for its “no word eating” performance – it does not cutoff endings of the words abruptly.
- The “Snare” and “Toms” modes were designed for processing of individual snare and tom drum tracks in a complex drum mix. This mode allows you to reduce bleed from cymbals in these tracks while mostly retaining the main sound of snare and tom drums.
- The “Cutoff” mode is a standard gating mode which cutoffs sounds below specified threshold abruptly.
- The “Classic” mode implements gating mode of Voxformer version 1.

## De-esser

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The “DS Thresh” parameter specifies threshold level of the de-esser. Signals above this level will be compressed. De-esser works in a side-chain mode: it does not perform band-splitting, but uses a band-pass-filtered signal as a key signal for de-esser activation. In essence, it is a broadband de-essing algorithm.

The “DS Freq” parameter specifies the center frequency of the band-pass filter.

Note that when the crossover is active, the “De-esser” module will be applied to the higher band only, after “Comp 2” is applied. Also note that when the “Pre” option is active the de-esser is applied before “Comp 1” (or before “Comp 2” if the crossover is active).

These predefined de-esser modes are available:

- The “Normal” mode offers standard de-essing settings.
- The “Extreme” mode provides stronger de-essing settings in comparison to the “Normal” mode.
- The “Precise” mode can be used to tame short-time transients precisely.

## Presence

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The “Presence” block controls the parameters of the presence effect.

The “Drive” parameter controls a Voxformer-type compressor which processes a band-pass-filtered signal and then adds the result (amplified by the “Gain” value) to the output.

These modes are available for your selection:

- The “Bright” mode adds a slight amount of high-frequency brilliance to the sound.
- The “Deep” mode adds some amount of low-frequency “boom” to the sound, often associated with “radio-station vocal booth”.
- The “Warm” mode boosts mid-range “warmness”.

## Saturator

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The “Drive” parameter controls the strength of the saturation effect.

The following saturation modes are available for choosing:

- The “Classic” mode is the saturation mode that appeared in Voxformer, on the date of plug-in’s first release. This mode can be considered rough-sounding, it adds a very bright edge to the sound.
- The “Warm” mode produces a warm, crunchy tube overdrive sound. It features strong even harmonics, at most “Drive” settings.
- The “Crisp” mode produces a less warm overdrive sound, with an added crispness and slightly reduced lower frequencies. While at low “Drive” settings the even harmonics prevail, at high “Drive” settings the odd harmonics prevail, producing a harder sound.
- The “Debass” mode produces overdrive sound with greatly reduced lower frequencies (at high drive settings). The odd harmonics prevail in this mode. This mode is “weird” in that it boosts the lower frequencies if the saturator's drive is below 15 dB, so this aspect can be also used creatively.

## In/Out

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The “Monitor” selector allows you to select an internal signal to monitor. The default “Off” option disables monitoring. The “Gate” option enables gate’s residual signal monitoring. The “Comp 1” and “Comp 2” enable monitoring of signals that exits Compressor 1 and 2, respectively. The “DS” option enables monitoring of the de-esser’s residual signal. The “DS Flt” option enables monitoring of the side-chain signal being fed to the de-esser. The “Presnc” option enables monitoring of the presence signal being added to the output. Note that the “Monitor” parameter is not saved with the project to avoid leaving the monitoring always enabled by accident.

The “In Gain” parameter adjusts the input gain. It is sometimes useful to adjust the input signal’s level if you are using a preset created for another signal level. This way you will not need to adjust other parameters.

The “Dry Mix” parameter specifies the amount of original unprocessed signal being added to the output before the final output gain is applied.

The “Out Gain” parameter controls the overall output signal gain. The “In Gain” and “Out Gain” parameters can be adjusted simultaneously in inversed manner with the

right mouse button. You may additionally hold the “Ctrl” (“Command” on macOS) key to engage direct (non-inverse) parameter adjustment. You may take a look at the “out/in” indicator to see the average loudness change taking place, which may be accounted for with the “Out Gain” knob, or via clicking on the numerical value of this indicator.

The “DC Filter” mode specifies which kind of DC filter should be used by Voxformer on its output stage. DC filter helps to avoid introduction of undesired DC offsets usually produced by compression.

## Mode Editors

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This section contains descriptions of various mode editors available in Voxformer. Note that mode editing is a feature presented for “advanced users” mainly and it may pose difficulties to users without deep knowledge of audio signal processing basics.

### Compressor Mode Editor

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This editor window allows you to define and store compressor settings.

The “X-Over Enable” switch enables crossover filter and engages 2-band compression.

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

The “Release” parameter adjusts compressor’s release time (in milliseconds).

The “Bias” parameter controls the amount of DC bias added to the key signal before it is used for compression. Such biasing produces asymmetric compression which is similar to tube compression with its half-wave asymmetry. Note that when the biasing is used, the achievable compression levels you can get are less extreme than you can get otherwise.

The “Smoothing” parameter controls compressor’s built-in “smoother”. The smoother is a very special process that optimizes compressor’s sound and reduces its excessive crispness (which sometimes sounds more like some harshness). This parameter specifies smoother’s corner frequency in Hertz. Thus, the lower value you specify the smoother the overall sound becomes. At very low values the compressor may sound very punchy, “ploppy” even, but nevertheless the overall sound will be very smooth. Values in a far kilohertz range produce crisp sound that resembles Voxformer version 1’s sound. Note that at higher values you may find it hard to evaluate differences between various settings. You may use lower “Smoothing” settings coupled with high compression drive values to hear the effect of this parameter distinctively.

## Gate Mode Editor



The “Gate Mode Editor” allows you to adjust crossover frequencies of the 4-band gate module used in Voxformer. Beside that, you may define parameters for each band separately.

The “Mute” switch allows you to mute selected bands. The state of the “mute” switches is not saved with the project (between sessions).

The “Fall/Cutoff A/Cutoff B” selector specifies algorithm to use for the band.

The “Attack” parameter adjusts gate’s attack time (in milliseconds).

The “Release” parameter adjusts gate’s release time (in milliseconds). Release time should be usually lower than the attack time to allow gate to recover quickly when the signal becomes louder again, over the gate’s activation threshold.

The “Avg Time” parameter controls the averaging time (in milliseconds) of the internal signal loudness estimation algorithm. Such averaging reduces chances of over-reaction to short transient signals.

The “Closed Gain” parameter specifies gain reduction applied (in decibel), when the gate “closes” (blocks band’s sound).

The “Thresh Shift” parameter specifies the shift (in decibel) of the threshold value used for this band relative to the master threshold value. This parameter adjusts the activation threshold of a band relative to other bands (e.g., with the purpose of retaining a sibilant sounds).

## De-esser Mode Editor

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This window contains de-esser module's advanced parameters.

The “Type” selector specifies de-esser algorithm to use.

The “Attack” parameter specifies attack time (in milliseconds) of de-esser's compressor.

The “Release” parameter specifies release time (in milliseconds) of de-esser's compressor.

The “Ratio” parameter adjusts the ratio of the de-esser's compressor.

The “LP Freq” parameter adjusts corner frequency (in Hertz) of the built-in smoothing filter which prevents de-esser from over-reacting to strong short-time transients. If you set this parameter to a very low value the de-esser may stop reacting on quick transient “ts”, “tch” and similar sounds. Lower values usually produce smoother-sounding results.

The “Bandwidth” parameter adjusts the bandwidth (in octaves) of the band-pass filter used in the de-esser.

## Presence Mode Editor

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The “Presence Mode Editor” allows you to define and store presence module's settings.

The “Attack” parameter adjusts attack time (in milliseconds) of presence module's compressor.

The “Release” parameter adjusts release time (in milliseconds) of presence module's compressor.

The “Center Freq” parameter selects center frequency (in Hertz) of the band-pass filter.

The “Bandwidth” parameter selects bandwidth (in octaves) of the band-pass filter.

## 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), “base64” code by Jouni Malinen, FFT algorithm by Takuya Ooura, filter design equations by Magnus Jonsson and 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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### Beta-Testers

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gl.tter

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**Special thanks go to Vitaly Zolotarev (<https://cleanaudiolab.com/>) for inspiration, ideas, testing, and presets.**

## Questions and Answers

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**Q. Does the saturation module in Voxformer sound like HarmoniEQ, Warmifier, or something completely different?**

**A.** It is something completely different. Both HarmoniEQ (its LT module) and Warmifier give a very moderate amount of distortion to create just a bit of saturation “flavor” while saturation module of Voxformer saturates the waveform much stronger. So, Voxformer’s saturation can be hardly useful on complete mixes while it may be a good treatment for a vocal or instrument track.

**Q. Does this channel strip compress the high/low frequencies?**

**A.** Yes, Voxformer is able to compress the low and high frequencies independently given an appropriate compressor mode was selected.

**Q. I don’t understand the presence controls. What is the difference between the presence drive and gain? Is the presence simply a band-pass EQ centered on the “center” frequency?**

**A.** Indeed, the “Presence” module uses band-pass filtered signal centered on a specific frequency, but then compresses it using the “Drive” parameter, and then adds the result to the output according to the “Gain” parameter.

**Q. Could you explain a bit about asymmetric compression? I’ve not run in to the term elsewhere.**

**A.** Asymmetric compression is a kind of compression when the positive half of the signal is compressed differently to the negative half of the signal. Tube equipment works this way, for example.

**Q. I was checking if the Voxformer would be a good choice for the initial vocal limiting of the microphone input, and if so, what the best setting would be.**

**A.** Such kind of limiting may not be performed with the plug-in as plug-in receives signal which was probably already clipped by the audio-card. You should use an outboard analog effects processor which can limit your vocal signal before it reaches the audio-card.

**Q. I know Voxformer is a vocal plug-in but it seems there are people using it for other things. I would appreciate if anyone could suggest alternative uses for this plug-in.**

**A.** This plug-in can be used for acoustic guitar, synth instruments, and drums as well.

**Q. Voxformer EQ vs. GlissEQ. Are the two comparable? Would I need GlissEQ if I already have Voxformer?**

A. When GlissEQ filter's "Dyn" parameter stays at "o" setting it sounds similar to Voxformer's filter. In other aspects these plug-ins are very different. For deeper control over equalization GlissEQ should be preferred.

**Q. The signal I am feeding this plug-in is not loud enough to register on the spectrum analyzer, I barely get it to show up, what can I do beside raising the input gain?**

A. You may either adjust the "In Gain" setting or change the visible spectrum range in the "Spectrum Mode Editor" window.

**Q. Is the "Presence" module suitable for mastering? I've noticed that it gives very good results.**

A. It is not exactly suitable for mastering as it can be too strong, and can act a bit uncontrollable on broadband signals.

**Q. Would this plug-in be as usable as a normal channel strip?**

A. Most probably, yes, it will be as usable. However, you may need to create your own mode presets for plug-in's processing modules to better suit sound sources you are going to process with it.

**Q. The de-esser seems to be not working properly. When playing full spectrum pink noise thru Voxformer and manipulating the de-esser's threshold, center, ratio, and bandwidth, the entire spectrum as viewed in the EQ window is moved and it is not frequency-specific. In other words, it is acting as a full spectrum compressor, not a frequency-specific compressor.**

A. De-esser in Voxformer works that way by design. The filter in the de-esser is used to produce signal that drives the de-esser's detector. It does not affect the signal itself. However, since this filter usually produces a narrow-band signal the de-esser reacts on sibilant sounds only (so, a noise is not a good test signal for it). Also, when you enable the crossover, the de-esser will be working on the higher spectrum part only thus increasing its precision.

**Q. Since the "Gate" module uses multi-band splitting, does it mean it induces a constant phase-shift to the signal?**

A. It is not quite so, because the "Gate" module uses smooth -6 dB/oct crossover filters that sum to unity. This means that when no gating happens the output signal is equal to the input signal.

**Q. What is the difference between the two de-esser algorithms?**

A. The difference is hard to describe qualitatively. You should better try both and decide for yourself. Algorithmically, the "Type 2" de-esser algorithm has a more

relaxed release stage and so its de-essing performance is stronger in comparison to the “Type 1” algorithm.

**Q. I’m trying to use the “Monitoring” options, but I do not hear anything.**

**A.** Make sure you have enabled the module you would like to monitor.

**Q. Voxformer seems to work as if I’m driving the signal into the compressor instead of lowering the threshold.**

**A.** Voxformer’s compressor works exactly that way – you are driving the compressor into increasingly harder compression, not adjusting the threshold.

**Q. Voxformer seems to enhance any background noise.**

**A.** Voxformer does not add any considerable noise on its own. In practice, an appearance of loud background noise usually means that you are over-compressing the input signal. To reduce loudness of background noise you may also use Voxformer’s noise gate.

**Q. One feature I would like to see in Voxformer is a voice doubling feature. Are there any plans for Voxformer to have this?**

**A.** For the purpose of vocal sound “densifying” the “Presence” module features the “Deep” and “Warm” modes. In essence, this module performs signal doubling.

**Q. Is it possible to set low- or high-pass filter’s slope to -48 dB/oct in Voxformer?**

**A.** This is not possible to do, but you may use two -24 dB/oct filters to get the necessary slope.

**Happy Mixing!**