



Voxengo Primary User Guide

(for VST, VST3, AudioUnit, AAX audio software made by Voxengo)

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Contents

Introduction 5

Common Features of Voxengo Audio Plug-Ins 5

User Interface Layout 6

Title Bar 6

Control Buttons 6

Plug-In Control Interface 6

Hint Line 6

Main Control Buttons 7

Plug-In Instance Name Edit Box 7

Oversampling Selector 7

Bypass Switch 8

A/B Switch Button 8

“A > B” (“B > A”) Button 8

Sat Switch 8

Standard Controls 9

Knob 9

Keyboard Value Entry 10

Value List Selector 10

Slider 10

Level Meter 10

Equalizer 11

Equalizer – Group Editing 12

Equalizer – Spectrum 13

Equalizer – Narrow-Band Sweeping 13

Envelope Editor 14

Quick Zoom-In 14

Scroller 14

Window Resizer 15

Spectrum Mode Editor 15

Static Spectrums Editor 18

- Undo/Redo 20
- Preset Manager 21
 - Main Preset Manager 21
 - Local Preset Managers 22
- Channel Routing Window 23
 - Layout 23
 - Input and Output Routing Selection 23
 - Show All Channel Meters 23
 - Mid-Side Pairs Selection 23
 - Channel Group Assignments 24
 - Key Signal Sources 24
 - In Channel Labels 25
 - Group Names 25
 - Routing Presets 25
- Channel Group Selector 26
 - Channel Group List 26
- Plug-In Settings for a Specific Plug-In 27
 - Color Scheme 27
 - User Interface Scale 27
 - Min Infrastructure 27
 - Show Groups Bar 27
 - Large Cursor Readouts 27
 - Oversampling 28
 - Auto Oversampling on Render 28
 - Meter “Density Mode” 28
 - Meter Integration Time 28
 - Meter Release Time 29
 - Meter Peak Level Hold Time 29
- Global Voxengo Software Settings 30
 - Auto Oversampling Level 30
 - Mouse Wheel Precision 30
 - Shift Key Precision 30

| | |
|--------------------------------------|----|
| Drag Precision | 30 |
| Tablet Mode | 30 |
| Show Virtual Keyboard | 30 |
| Remember Window Positions | 31 |
| Enable Mouse Wheel On Lists | 31 |
| Show Preset Selector | 31 |
| Show Knob Labels | 31 |
| Radial Knob Mode | 31 |
| Control Surface Crosshair | 31 |
| Curve-Drag Adds Points | 31 |
| Import Spectrum Filling | 31 |
| Do Not Show Latency Changes | 31 |
| VST 2 Function Sync | 32 |
| No Multi-Channel Operation | 32 |
| Visual Settings | 32 |
| Plug-In Files' Locations | 33 |
| Portable Setups | 33 |
| Additional Information | 34 |
| Selecting Best Audio Buffer Size | 34 |
| 64-Bit Audio Processing | 34 |
| Plug-In Registration/Authorization | 34 |
| CPU Load Measurement Notice | 34 |
| Knowledge Bit – Correlation | 35 |
| Stereo Correlation | 35 |
| Knowledge Bit – Aligning Microphones | 36 |
| Alignment Steps | 36 |
| Microphone Delay Alignment | 36 |
| Microphone Phase Alignment | 37 |
| Microphone Gain Alignment | 37 |
| High-Frequency Drop Issue | 38 |
| Why Go Multi-Microphone? | 38 |
| Questions and Answers | 39 |

Introduction

Voxengo audio software products feature a set of standard interface elements that are shared among all Voxengo products.

This guide describes functionality of these elements, focusing on the interaction between the user and the software. This means that this guide does not describe an actual application of user interface elements (some may control Gain, some may control Frequency, etc.), but shows the ways of using these elements efficiently from the user perspective. After reading this guide you will be able to use common features of Voxengo audio software. Any non-standard or special features are described in the guides for the software that contains these non-standard or special features, and are not covered by this guide.

Beside user interface description, this guide contains important technical information about Voxengo plug-ins.

Common Features of Voxengo Audio Plug-Ins

- Preset manager
- A/B comparison switch
- Internal channel routing
- Mid/side processing
- Undo/redo history
- Input channel naming
- Channel grouping
- Channel group naming
- Settings (coloration, scale, hints)
- Global settings (control precision, etc.)
- Plug-in instance naming
- Oversampling
- Bypass switch
- External side-chain (where applicable)
- Contextual hint messages

User Interface Layout

The graphical interface of every Voxengo plug-in consists of four distinctive parts: the title bar, the control buttons array, the plug-in control interface and the switchable hint line.

Title Bar



The title bar shows hint enable switch, plug-in's title, and also contains the Plug-In Instance Name text box, the Oversampling selector and the "Bypass" switch. Note that this title bar will not be visible, if the "Min Infrastructure" option in the "Settings" window was enabled.

Some plug-ins have differently-looking title bar that only displays plug-in's title with one or several control buttons.

Control Buttons



This part of the user interface contains several control buttons: the "Presets" button which opens the preset manager popup window; the quick preset selector "down" button; three change history-related buttons; the A/B comparison button; the "A > B" ("B > A") state copy button; the "Routing" button which opens the channel routing window; the quick routing preset selector "down" button; the channel group selector; and (at the far right) the "Settings" button which opens a popup window with the product's copyright information and additional settings.

Plug-In Control Interface

This part of the user interface varies greatly from software product to software product, and an in-depth description is available on a per product basis, in a separate user guide.

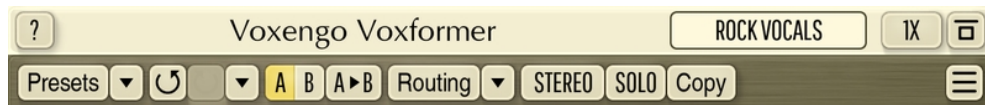
Hint Line

Compressor 1 drive (dB). Drag with the right-mouse-button to simultaneously change the Comp 2. Hold the Ctrl/Cmd key to change it inversely.

This interface element displays hint messages and may also display other informational messages. The hint line can be enabled with the "?" button in the title bar.

Main Control Buttons

Most Voxengo plug-ins feature a set of standard control buttons. They are shown and described below.



Plug-In Instance Name Edit Box

This control element allows you to give a name to the current plug-in instance. This name is used for informative purposes only: it helps you to remember the purpose of the plug-in, or gives you a note of a name of the host's audio track the plug-in is inserted into. For example, the instance name can be set to "Vocals", "Drum Bus", "Polysynth", "Bass", "Lead Guitar", etc. By default, the instance name reflects track's name (not supported in VST2 plug-ins).

Oversampling Selector

This selector allows you to select a "quality factor" for the plug-in. Oversampling allows a plug-in to run at a higher internal sample rate thus offering a better overall sound quality. Almost all types of audio processes benefit from oversampling: probably, only gain adjustment, panning, and convolution plug-ins have no practical use for it.

Oversampling helps plug-ins to create more precise filters with minimized warping at highest frequencies, to reduce spectral aliasing artifacts in compressors and saturators, to improve level detection precision in dynamics algorithms. The higher the oversampling setting is, the more CPU resources plug-in would consume since CPU load is increased proportionally to the specified oversampling setting: at the "8x" oversampling setting the plug-in uses exactly 8 times more CPU time (and that is excluding the time necessary to perform oversampling itself).

The "Auto" oversampling option is a special option that enables oversampling when the project is being rendered (bounced, exported) to an audio file; in this mode, when the plug-in works in real-time mode, oversampling is set to the "1x" option (some plug-ins may use "2x"). If the "Auto" option was not used then the specified oversampling amount will be used during both rendering and in real-time. The "Auto" oversampling mode engages the "4x" oversampling mode during rendering, if the working sample rate is below 72 kHz; the "2x" mode is engaged if the sample rate is below 144 kHz; otherwise, oversampling is not engaged at all (for example, if the working sample rate is equal to 176.4 kHz or 192 kHz the oversampling will not be engaged).

The maximum oversampling level used when the "Auto" mode is engaged can be adjusted in the global settings window. Note that when the plug-in enters the rendering state or is being applied as a one-time effect, the "Off-Line Render" notification will be displayed on its interface. If this notification is ever displayed, it also means the "Auto" oversampling option will be working correctly.

In the “Settings” window of most Voxengo plug-ins you can choose the oversampling filter type to use. When the “Min-Phase” type is selected, a Voxengo plug-in will be using polyphase IIR low-pass filter with at least 150 dB stop-band attenuation and 4% transition band’s width (which starts at $F_s/2$) for oversampling. Please note that these polyphase filters impose a phase coloration which sounds slightly different at various working sample rates.

Voxengo plug-ins using the “Lin-Phase” filter type use linear-phase filters with 180 dB stop-band attenuation and 4% transition band’s width (centered at $F_s/2$). Note that when working at 44.1 kHz sample rate, linear-phase oversampling filters cut frequencies above 20 kHz. This is a standard side-effect of oversampling, and it should be considered normal.

Please also read the part titled “Oversampling” under the “Plug-In Settings for a Specific Plug-In” topic.

Bypass Switch

The Bypass switch was mainly designed for evaluation of changes a plug-in made. The Bypass switch will not reduce the plug-in’s CPU load when switched on.

A/B Switch Button

By pressing the “A/B” switch button, you can switch between the current and an opposite (“A” or “B”) plug-in states.

You can use the “A/B” switch button to copy programs between Session Bank’s slots. To do so, in the Session Bank you first need to switch to a program you want to copy and then press the “A > B” (or “B > A”) state copy button. Next, switch to a program where you want to put the first program and then finally press the “A/B” switch button again. (The preset manager and its preset banks are discussed later in this guide.)

“A > B” (“B > A”) Button

The “A > B” (“B > A”) button copies the current plug-in state to an opposite state. You may then switch to this opposite state by pressing the “A/B” button.

Sat Switch

Some plug-ins feature a built-in soft-knee output limiter. This switch enables this limiter. This limiter controls output signal level and produces “console saturation” effects. Note that neither limiter mode nor soft-clipping threshold are adjustable.

Standard Controls

Knob



The knob control consists of four parts: the name of parameter it controls, the circular position marker, the center of the knob, and the parameter value readout.

The knob position marker is represented by a circular lighted indicator. You may drag this marker to adjust the value of the parameter using the circular knob adjustment approach: during dragging, you may move the mouse cursor farther away from the knob to increase parameter value adjustment precision. You may click on the marker to set the desired parameter value immediately. This way of adjusting the knob is available only if the “Radial Knob Mode” global setting was enabled.

The center of the knob has a defined color that corresponds to the parameter or parameter group the knob controls. You may drag the center of the knob to adjust the value of the parameter with up and down mouse movements, linearly. While dragging the center of the knob with the left mouse button, by additionally pressing the right mouse button you can enable a high precision adjustment mode (which can otherwise be enabled by holding down the “Shift” key). Dragging precision can be adjusted in the global settings window.

The parameter value readout displays the current value of the parameter.

When knob is hovered with the mouse cursor, a scale ring is displayed that shows approximate parameter values at different knob positions (“knob labels”). Thousand values are suffixed with an asterisk (e.g., “2*”). This ring can be disabled in the global settings window.

In some plug-ins you may use the right mouse button to enable knob linking. The linking between knobs is available when two given knobs are logically linked (for example, input and output gain knobs, low and high frequency knobs, etc.). You may hold the “Ctrl” (“Command” on macOS) key before dragging a knob with the right mouse button to enable inverse knob linking: in this mode every positive increment of the knob you drag results in a negative increment in the linked knob.

Knob can be also controlled with the mouse wheel. Double-clicking on the knob resets it to the default state.

| | | | |
|-------|------|------|------|
| Front | Cntr | LFE | Side |
| 22.4 | 22.4 | 22.4 | 22.4 |

When working in surround, dual-mono, or any other multi-group processing mode, you may hold the “Alt” key to enable linked change of the knob in all channel groups with active channels in them. This may not work for all knobs since such feature may not be applicable to a parameter a particular knob adjusts.

Keyboard Value Entry

Most readout values displayed on the user interface (gain, frequency, parameter value readouts) can be clicked for keyboard value entry (some plug-ins whose parameter value readouts can be dragged require double-click for keyboard entry).

Value List Selector



This type of control allows you to choose a value or an option from the list. You may press the selector button with the left mouse button, to display the value or mode list. If you later depress the mouse button on the desired value instead of the selector itself, the list will be closed and the value on which you have depressed the mouse button will be selected.

Note that mode preset lists are different to value lists in that mode preset lists do not highlight a currently selected mode when you open the list.

Value and mode preset lists offer you additional ways of item selection without opening the list: you may use mouse's "forward" and "backward" buttons and mouse wheel to scroll through the values (if the "Enable Mouse Wheel On Lists" global setting is enabled). You may press the right mouse button on a value selector (but not on a mode preset selector) to switch between the current and default values.

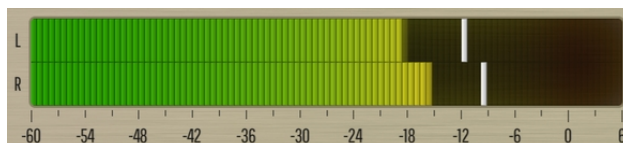
Slider



Voxengo plug-ins feature horizontal and vertical sliders. A slider can be dragged with the left mouse button to perform adjustments. While dragging the slider with the left mouse button, by additionally pressing the right mouse button you can enable a high precision adjustment mode (which can otherwise be enabled by holding down the "Shift" key).

If a plug-in presents you an array of sliders (like the "Marvel GEQ" plug-in does), by holding down the right mouse button on the slider array you will engage the "drawing" mode that allows you to position sliders in the "free-hand" mode.

Level Meter



Many Voxengo plug-ins feature standard level meters. Each level meter contains level scale ruler (in decibel) and several level bars that correspond to channels (“L”, “R”, “3”, etc.) of the currently selected channel group (level meter displays all available channels, if the “Show All Channel Meters” switch is enabled in the “Channel Routing” window). In some cases, level meters are shown in the “minimal” variant with only a single level bar present which averages level from all channels of the currently selected channel group.

Gain reduction meters are displayed inversely (from top to bottom), and may show positive gain reduction values since, if not specified otherwise, they are showing gain reduction changes relative to the average gain reduction over 2-second time frame. This type of gain reduction metering displays “dynamic coloration” that occurs during compression: this way it is very easy to spot how much “colored” the sound becomes. Such “relative” gain reduction metering is non-conventional, but it may be very effective at understanding how much the signal level is changed dynamically rather than constantly. The “out/in” indication on the level meter further displays constant gain adjustment applied by the plug-in.

Level meters may show a small horizontal white bar which represents peak level. In output level meters such peak level may turn red which means that the output level has entered the area above the 0 dBFS signal level and clipping may occur, if the plug-in stays last in the audio host application’s signal chain (if the plug-in is staying in the intermediate position before other plug-ins clipping may not necessarily occur). In non-output level meters used in the plug-in a red peak level may be only an informative indication that some predefined threshold level was reached.

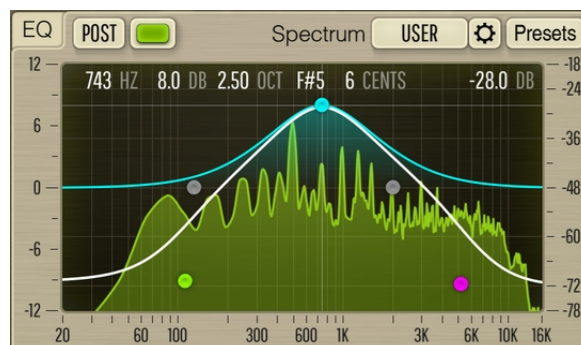
Level meter ballistics and peak level hold time can be defined for all instances of the plug-in in the “Settings” window.

Output level meters usually feature the “out/in” readout that displays the RMS level difference between the output and input signals of the plug-in (this level difference estimation is based on 3-second integration time). In most plug-ins this value can be clicked to trim the output gain knob’s value.

Equalizer

Several Voxengo plug-ins feature an equalizer with the built-in real-time spectrum analyzer. While the visual appearance of the equalizer is similar among Voxengo plug-ins, the equalizing algorithm used by any given plug-in may be different from other plug-ins.

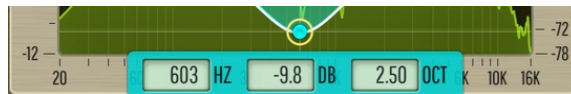
Note that information contained in this chapter applies to parametric equalizers only, this part does not apply to envelope-driven equalizers like CurveEQ – please refer to the Envelope Editor chapter for information on envelope editing.



This picture shows the “control surface” with control points which can be dragged with the left mouse button to adjust the filter’s gain and frequency that corresponds to this control point (you may additionally hold the “Shift” key to enable precise adjustments).

You may select the filter type of the control point by pressing the right mouse button on that control point. By default, the filter type is set to “Off” making the control point appear grey. Alternatively, you may use the mouse’s “forward” and “backward” buttons to scroll through the filter types.

The readouts you see on top show mouse cursor position within the control surface. The readout also displays the musical note (and detune in cents) that corresponds to the frequency position. The rightmost readout shows mouse cursor’s position within the spectrum power range.

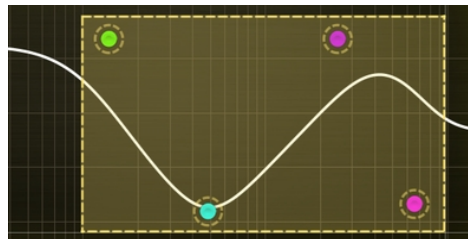


Clicking on a control point with the mouse button will make the point encircled, and the corresponding filter's frequency response curve will be shown in control point’s color. The white curve shown in the equalizer window shows the summary frequency response of all currently enabled filters. When the control point is encircled, three entry fields will be also displayed which you can use to specify filter’s parameters via keyboard precisely (these entry fields may not be available in a particular plug-in, or may be represented by knobs).

While dragging a control point with the left mouse button, you can adjust the filter's bandwidth by additionally holding the right mouse button (or holding down the “Alt” key). Alternatively, you can use the mouse wheel to adjust the filter’s bandwidth. You can hold the “Ctrl” (“Command” on macOS) key while dragging a point to enable its gain adjustment only; holding the “Ctrl” (“Command” on macOS) and “Alt” key simultaneously enables control point’s frequency adjustment only. Double-clicking on a control point with the “Ctrl” (“Command” on macOS) key held returns this point to the 0 dB gain position.

Double-clicking on a control point without any key being held temporarily disables it. Second double-click will re-enable the control point. A disabled control point will be re-enabled whenever you move it. Some plug-ins may allow you to double-click or “Shift+Click” the control surface anywhere to add a new filter (the filter type will be auto-selected depending on the frequency where the filter was added at).

Equalizer – Group Editing



You can also perform editing operations on a group of control points. To select several control points, drag inside the control surface itself. A box area will appear, and all control points inside this area will become selected. Later you can move a

group of selected points like you are working with a single point. Dragging selected points up and down scales the gains of the filters up and down, up to the point of gain inversion.

To add control points to the current selection, you have to hold the “Shift” key before starting to drag inside the control surface. While holding the “Shift” key, instead of dragging you may also click on the control point you want to add or remove to/from selection. If several points were selected the double click on any of the selected points with the “Ctrl” (“Command” on macOS) key held will reset all selected points to 0 dB.

To deselect any currently selected points, simply click the control surface anywhere. You may right-click the control surface to select all control points at once.

The “Presets” button opens preset manager for the equalizer.

Equalizer – Spectrum

Beside control points and frequency response plot the equalizer window also displays the Fourier spectrum analysis plot. The spectrum analysis and displaying parameters can be selected via the “Spectrum” mode selector. The “Spectrum Mode Editor” can be used to customize these parameters further. You may also click the control surface with the left mouse button anywhere to reset spectrum analysis display. Note that Voxengo plug-ins by default use the “Hann” or “Dome” windowing functions to perform FFT analysis.

A red vertical line can be displayed, if the visible frequency range is wide: this line shows maximal frequency of the input signal and depends on the input sample rate. A second red vertical line may be displayed, if oversampling is in use: this second line informs you about the internal frequency range used by the plug-in at this moment. Note that until you start the audio playback the red line may not be placed correctly, because the plug-in may not know the correct input sample rate until the audio processing is started.

Note that by default Voxengo plug-ins use 4.5 dB per octave slope for the spectrum display which makes it look considerably “elevated” towards the higher frequencies, in comparison to most other spectrum analyzers available on the market. This setting can be changed in the “Spectrum Mode Editor” window. The slope is defaulted to such value, because the power spectrum of contemporary music very closely follows this slope; by applying the slope, it becomes more easier to evaluate the spectrum.

If the spectrum does not fit the display, you may adjust the visible spectrum range in the “Spectrum Mode Editor” window, or dragging the popup readouts on the range scale.

Equalizer – Narrow-Band Sweeping

You may enable the “narrow-band sweeping” function by first holding the “Ctrl” (“Command” on macOS) key and then dragging the control surface with the left mouse button. As a result of this action, you will see the curve of the band-pass filter that only passes the selected frequency range. You may adjust the bandwidth of the filter with the mouse wheel. Such mode is useful at highlighting resonances in the sound.

Envelope Editor



Some Voxengo plug-ins feature an envelope editor. The function set of this editor is basically the same as that of the equalizer. The main difference lies in the manner the curve is being drawn. Control points in the envelope editor are always connected by a line or a smooth curve, without intersections, and there are no “filters” with their corresponding “filter shapes” attached to each control point. In the envelope editor you may add and remove control points freely by double-clicking or “Shift+Click” in the desired position within the envelope editor’s area.

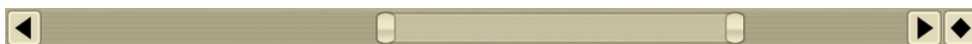
To delete a control point you should double-click it. The leftmost and rightmost control points cannot be deleted – they will be moved to envelope’s default position when double-clicked. If you are double-clicking a control point with the “Ctrl” (“Command” on macOS) key held, the control point will be set to envelope’s default position.

While any single control point can be moved freely around the control surface, movements of grouped control points are constrained. There are two types of group movements possible: when you drag a control point (if more than a single control point is selected), the vertical movement is constrained, and you can move points horizontally; when you drag a line segment, the horizontal movement is constrained, and you can move points vertically. If you hold the “Ctrl” (“Command” on macOS) while dragging, the constraints are removed. The mouse wheel can be used to move the control point closest to mouse cursor’s position vertically.

Quick Zoom-In

You may hold the “Alt” key while dragging the control surface to zoom-in the selected spectrum area. Double-clicking the control surface with the left mouse button while the “Alt” key is held acts as zoom-out function.

Scroller



Some Voxengo plug-ins feature horizontal and vertical scrolling controls with zooming functionality. Such scrollers are usually attached to the sides of equalizer’s “control surface” discussed above. You may move a scroller only after using its zooming function.

A pair of horizontal and vertical scrollers is accompanied by a rhomb which can be used to control position of both scrollers at once in a single X-Y coordinate space.

Scrollers and rhombs can be double-clicked to switch the visual state of the view they are attached to. You may use this functionality to quickly switch between zoomed and non-zoomed visual states of a view.

Window Resizer



This control that may be present in the bottom right corner of the user interface window can be dragged to adjust the size of the window.

Spectrum Mode Editor



The “Bypass” switch, located at the title-bar, completely bypasses spectrum analysis function of the plug-in.

The “Type” selector specifies which spectrum analysis type should be used. The “RT Avg” mode engages the real-time spectrum averaging analysis. This type of analysis produces averaged spectrum over the specified period specified by the “Avg Time” parameter. The “Max” type of analysis produces cumulative maximum power spectrum. If you need an “infinite” peak hold, please use the “Max” analysis type. The “Avg” type of analysis produces cumulative average power spectrum. The “RT Max” produces real-time maximum spectrum with spectrum fall-off (for better spectrum maximum estimate it is suggested to use a higher “Overlap” setting). The “RT Sigma” produces sigma spectrum which shows how much dynamic certain spectral areas are.

The best way to use the “RT Sigma” mode is together with the “RT Avg” mode, with the “Avg Time” values lower than 1000 ms. This way you can easily see spectral areas that are more or less dynamic: the areas that are highly dynamic will be displayed as equal or above the “RT Avg” spectrum, while the less dynamic areas will be displayed below it. Practically, such double-spectra monitoring indicates parts in program material that have the most psycho-acoustic impact, that draws listener’s attention.

The “Filled Display” switch enables additional semi-transparent filling of the spectrum area.

The “2nd Spectrum” switch enables the secondary spectrum curve which is displayed in a darker color. The “2nd Type” selector selects analysis type to use for the secondary spectrum. For example, by setting the “2nd Type” to “RT Max” and “Type” to “RT Avg” you may see the average and maximum spectrums simultaneously. When the “RT Avg” spectrum is displayed together with the “RT Max” spectrum, the visual

distance between the spectrums correlates with program material's dynamic range. Note that the secondary spectrum uses the same "Block Size" and "Avg Time" parameters as the primary spectrum.

The "Block Size" selector specifies the block size of the FFT (fast Fourier transform) spectrum analyzer. Higher block sizes provide more resolution in the lower frequency range, but decrease time coherence (time precision) in the higher frequency range: the higher frequency information becomes over-averaged. Also, at higher "Block Size" settings the spectrum is refreshed less frequently. This can be mostly fixed by increasing the "Overlap" parameter which increases spectrum refresh frequency. The higher "Block Size" settings naturally increase visual latency of the spectrum analyzer: this is an expected behavior, and, technically speaking, it cannot be fixed without introducing a large delay to the audio signal.

Note that you will generally need to increase the "Block Size" when working at increasingly higher sample rates since the specified "Block Size" setting is used over the full spectral bandwidth, and so at higher sample rates analyzer's resolution in the audible frequency range will be lower for the given "Block Size" setting.

If you would like to measure frequency of a low-frequency sound (e.g., bass drum or bass guitar) precisely you should use a higher "Block Size" parameter value along with a higher "Overlap" parameter value. You may naturally need to set a higher "Overlap" value with a higher "Block Size" value because otherwise the spectrum display may start blinking.

In order to avoid clicks and glitches in playback when using high "Block Size" values you may need to increase the audio buffer size in your audio host application as spectrum analysis of larger blocks requires more processing resources and introduces bursts of CPU processing.

The "Window" selector specifies windowing function (window) used for FFT analysis:

1. The default "Hann" window is best used for music analysis as it offers a superior separation between adjacent frequencies: this is especially important at lower frequencies.
2. The "Hi-Res" window is a non-conventional window ("Nuttall" squared) designed for technical analysis: when using this windowing function, it is possible to measure the noise-floor and detect various spectral artifacts.
3. The "Blackman" window offers a slightly better separation of quiet components, in comparison to the "Hann" window, and at the same time it has a better separation between frequencies in comparison to the "Hi-Res" window.
4. The "Dome" window is a non-conventional window designed for musical signals analysis – it offers an even better frequency resolution compared to the "Hann" window, but has a much lower separation of quiet components, and is less suitable for large FFT block sizes.

The "Overlap" parameter controls the time overlap between the adjacent FFT spectrum analysis blocks. E.g., 80% means the block currently being calculated is overlapped with the previously calculated block by 80% in time. Higher overlap values allow spectrum to be updated more frequently at the expense of a higher CPU load.

The “Avg Time” parameter specifies averaging (fall-off) time (in milliseconds) used when the “RT Avg” or “RT Max” analysis is active. This value specifies time it takes spectrum level to fall down by 20 dB.

The “Smooth” parameter selects spectrum smoothing function’s resolution in octaves. Note that smoothing being solely visual, produces 6 dB per octave drop when stationary sine-wave signals are analyzed. E.g., even if the signal consists of 2 sine-waves (1 kHz and 2 kHz) of equal peak amplitude, the 2 kHz sine-wave will look like it is 6 dB quieter. This happens because the fast Fourier transform produces a narrower spectrum for high-frequency stationary signals in comparison to low-frequency stationary signals. This drop does not practically appear when non-stationary (musical) signals are being analyzed.

The “Offset” parameter selects spectrum’s offsetting. The “Normalize” offset mode normalizes all spectrums so that the loudest frequencies are displayed on top. The “Center” offset mode centers all spectrums: this mode can be especially useful when comparing several spectrums as it removes the overall loudness factor from the comparison.

The “Freq Low” and “Freq High” parameters (if they are available in a given plug-in) specify the accessible (and visible) frequency range (in Hertz) of the spectrum view.

The “Range Low” and “Range High” parameters select accessible (and visible) spectrum power range (in decibel).

The “Slope” selector (which is defined in dB per octave) allows you to adjust spectrum analyzer display’s slope around 1kHz. Skewing the spectrum can be useful, because higher frequencies usually have weaker power in comparison to the lower frequencies. By choosing an appropriate spectrum slope, you can compensate for this fact and make the spectrum plot look more convenient and meaningful.

The “Anti-Alias” switch enables anti-aliased spectrum curve drawing.

The “Align 0 dB” switch enables alignment of stationary 1 kHz sinewave of 0 dBFS peak level to 0 dB visual level, irrespective of the “Block Size” setting. This mode may be useful for precise technical analysis of signals. When this switch is enabled, you may also need to set the “Slope” to 0, and adjust the “Range Low” and “Range High” values.

Note that when using the “Dual Mono” or similar multi-channel routing setting, while configuring spectrum modes for different channels, the displayed “Underlay” spectrum may become visually desynchronized. To resolve this issue, left-click on the control surface once to restore the synchronization.

Static Spectrums Editor



Some Voxengo equalizer plug-ins feature static spectrums display that can be controlled via the editor window shown above. You may select the display name of the spectrum slot, its color, the shift in decibel of the static spectrum on the control surface. The static spectrum can be shown or hidden via the visibility checkbox. The shift in decibel can be used for a more convenient placing of the static spectrum on the screen, and it does not affect the shape of the spectrum.

The “Take” and “Take 2nd” buttons take a snapshot of the primary or secondary spectrum, respectively. The static spectrums you “take” use spectrum parameters specified in the “Spectrum Mode Editor”. If after pressing any of these buttons no spectrum is taken, it means that no spectrum is currently available – you either have to configure the spectrum mode or start the audio playback first.

Before taking a spectrum, please do not forget to choose an appropriate spectrum analysis type via the “Spectrum Mode Editor” – usually “Avg” or “Max” (or you may simply load the factory “Average” or “Avg+Max” spectrum mode preset), and analyze long enough so that spectrum becomes general enough. When analyzing a song, it may be a good idea to store separate spectrums for verse, chorus, and bridge parts as they may have distinctively different spectral balance. To do so, click on the spectrum to reset it before taking another spectrum.

The “Predef” button allows you to load one of the predefined static spectrums. Note that “Combined -4.5/oct” static spectrum represents a slightly adjusted C-weighting curve plus -4.5 dB/oct slope.

The “Load” and “Save” buttons allow you to load and save the spectrum file into/from the static spectrum slot. The files have the “.csf” (compressed spectrum file) file extension, or are stored in the “csv” (Excel) text format, if this extension is given to the file explicitly. Note that spectrum’s frequencies are saved to a “csv” file in the “raw” linear frequency scale format, and not in the displayed logarithmic scale; the power values are specified in decibel. You can also load spectrum from a PCM sound file (“.wav”, “.aiff”, or “.flac” file extension).

The “x” button resets the spectrum in the selected slot.

When a spectrum is available in the static spectrum slot, the spectrum’s parameters are also displayed. They correspond to parameters that were configured via the “Spectrum Mode Editor” when the spectrum was taken.

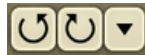
The “Filled Display” switch enables display of all static spectrums in a filled form.

The “Spectrum Mode” selector in this window was added for a quick access to spectrum mode presets: it is equivalent to the spectrum mode selector and editor located on the main plug-in window.

Undo/Redo

Voxengo plug-ins offer a convenient way of managing changes you apply to the plug-in's state. When you apply a change to any control, its previous and new values are stored in the "change log" which you can then use to "unwind" and "rewind" any previously made changes. This way you can be sure that no single unwanted nor occasional change you do affects the state of the plug-in in a wrong way.

Undo/redo control consists of three buttons: the "Undo", the "Redo", and the "History".



The "Undo" button allows you to un-do changes made to the plug-in's state.

The "Redo" button allows you to re-do changes that were already un-done via the "History" or "Undo" buttons.

The "History" button opens the change log (history) that lists all changes made to the plug-in's state in the order you have made these changes before. You can re-do and un-do changes to any level of depth, instantly. Change log keeps track of the recent 32 changes you have made. Note that a parameter change is logged with group name placed in parentheses (e.g., "Gain (Ls) change").

Preset Manager

Main Preset Manager

Almost every Voxengo audio plug-in features the main preset manager which you can use to store plug-in state presets you define.



Presets in the main preset manager are shared among all instances of the same Voxengo plug-in. All presets within the main preset manager are stored in user preset banks. Beside user preset banks, two special banks exist: the “Session Bank” and “Factory ROM” banks.

The “Session Bank” contains “programs” rather than presets. Each program in the “Session Bank” contains its own undo/redo change log, meaning that when you switch the program in the “Session Bank” you are also switching the undo/redo context. A currently selected program is specified by the “right arrow” symbol. The “Session Bank” lists programs that “mirror” programs of the VST audio host application (in AAX- and AudioUnit-compatible applications this bank can be used as a temporary preset palette). When you are activating a program in the “Session Bank” you are actually switching the current program in the VST audio host application (in AAX- and AudioUnit-compatible applications program switch in the “Session Bank” is similar to a plain preset switching).

The “Factory ROM” bank lists presets that were pre-programmed by the plug-in’s producer. These presets cannot be changed, but can be activated. The “Factory ROM” bank is also loaded into the “Session Bank” every time a new instance of the plug-in is created in the audio host application.

The main preset manager contains the following control buttons:

The “Activate” button (or double-clicking on a preset name) loads the selected preset as a new plug-in state.

The “+”, “-”, “Load”, and “Save” buttons allow you to add and remove the bank or preset, and load and save the bank or preset to and from a disk file. Right-clicking the “+” button inserts preset into the current list position rather than to the end of the list if the left mouse button is clicked. The “Update” button allows you to update a currently selected preset by storing the current plug-in state into it.

Please note that Voxengo plug-ins use a proprietary format to store presets and preset banks on disk. It is suggested that you add a comprehensive name prefix to

the bank and preset files when saving, so that you would not mix up presets created in different Voxengo plug-ins; during a save operation, the plug-in will offer you a default name prefix automatically. Voxengo plug-in preset files possess the “.cpf” file extension while preset bank files possess the “.cbf” file extension.

The “Set as Default” button allows you to designate a selected preset to become the default preset, which is loaded automatically whenever a new instance of a plug-in is created. If you want to restore the original default preset you should press the “Set as Default” button on the “Default” preset in the “Factory ROM” preset bank.

To change a name of the preset or bank you should at first select the required item and then after a small delay click the item again. Please do not mix this operation with a fast double-click which activates a selected preset.

The “Sort” button in the preset list can be used to sort the preset list in an alphabetical order. Note that this operation cannot be undone.

Local Preset Managers

Voxengo plug-ins also feature the so called “local” preset managers: for example, the one available in the “Channel Routing” window. These preset managers do not possess preset banks, and are not related to the main preset manager: they work independently from the main preset manager.



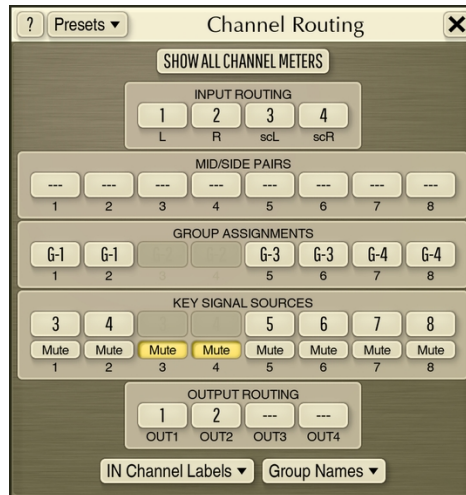
Local preset managers usually manage presets for a specific module of a specific Voxengo plug-in. The “Update” button can be used to quickly update selected preset to the current state.

Presets available in the “Routing Presets” local preset manager are globally accessible to Voxengo plug-ins of all kinds. These presets greatly minimize routine adjustments you may need to perform after creating a new plug-in instance in your audio host application. Routing presets that are not compatible with the current plug-in are shown grayed out with the “(n/a)” prefix.

Channel Routing Window

Layout

The “Channel Routing” window consists of a set of selection buttons assembled in the following groups: the “Input Routing”, the “Mid-Side Pairs”, the “Group Assignments”, the “Key Signal Sources”, and the “Output Routing”:



Input and Output Routing Selection

These groups of buttons allow you to route external plug-in inputs to internal plug-in channels and vice versa: to route internal plug-in channels to external plug-in outputs. A plug-in has a pre-defined number of internal channels while the number of input and output channels may vary depending on the audio host application’s track or bus where the plug-in resides.

Note that if input routing selector appears red, it means that this selector refers to a non-existent input channel: you may correct this warning by selecting an existing channel. External side-chain inputs are denoted by parenthesized labels: for example, “(IN3)”, “(IN4)”.

Show All Channel Meters

This option enables displaying of all channel meters and statistics counters regardless of the currently selected channel group. When this option is not enabled, only meters belonging to the currently selected channel group will be shown. Enabling this option is useful when you are using dual mono or mid-side processing: this option allows you to see channel meters for left and right, or mid and side channels together.

Mid-Side Pairs Selection

These buttons (if available in a particular plug-in) allow you to assign internal channels to mid-side encoding/decoding pairs. The mid-side encoding is a widespread technique that allows you to process stereo signal’s middle (center) and side (spatial) information independently from each other thus offering a great deal of control over that signal’s stereophony. Mid-side encoding works with paired

channels only and thus requires two channels to be assigned to the same mid-side pair. An input signal is mid-side encoded before it is processed by the plug-in, and decoded afterwards before it is routed to the output of the plug-in.

Channel Group Assignments

The plug-in allows you to assign its internal audio channels to logical groups of channels. Each group with its channels is affected by its own set of parameter values (it can be an EQ shape, a gain factor, an overdrive setting, etc.) The current channel group is selected via the channel group selector.

Individual audio channels can be attached to different channel groups. For example, this allows you to have individual EQ settings for channel “L” and for channel “R”, separately. To achieve this, you may simply assign channel “L” to group “G-1”, and channel “R” to group “G-2”.

In a surround setup, you may assign left and right channels to group “G-1” while surround channels to group “G-2”, and apply an EQ shape to them independently from each other.

Each plug-in audio channel can be assigned to a single channel group only. Channel grouping also affects channel-linking in case of dynamics processing and other processes that estimate signal loudness envelope: channels assigned to the same group will be linked during processing and signal loudness estimation. The mode of such linking (max of all, average of all, etc.) may be specified with an additional plug-in control, if available.

Key Signal Sources

This set of buttons (if available in a particular plug-in) allows you to assign key signal sources to all internal channels. For example, instead of using left channel’s own signal to trigger processing performed on this channel, you may assign the right channel to trigger processing performed on the left channel. Key signal sources are usually used in dynamics processing plug-ins. The technique when any particular channel is used as a “key” for another channel is called ducking: “key” channel “ducks” another channel. E.g., a bass guitar track may be “ducked” by a drum track, if necessary.

If some internal channel is only used as key signal source (e.g., this channel is an external side-chain signal), this channel can be “muted” via a switch: in such case this channel will not be processed and sent to the output together with channels that were not muted. Such “muted” channel will be available to plug-in’s internal algorithms only.

Please note that external side-chain sources are always represented by individual input channels in the plug-in. While audio host applications that support AudioUnits usually offer a convenient one-click “side-chain” input selection for the plug-in, these side-chain inputs are shown as additional input channels in the “Channel Routing” window of the plug-in, with their names parenthesized: e.g., “(IN3)”. These channels should be routed in the same way as ordinary channels are routed, including setting up required key signal sources assignments. Even though such way of setting up external side-chain does look somehow complicated, it offers a very deep control over side-chaining: for example, it allows you to perform mid-side encoding of the side-

chain input before it is used for keying; another useful feature is that you can swap channels of the side-chain input effortlessly.

In Channel Labels

By pressing this button, you can open the channel label assignment popup window. You can give individual names to input channels in order to make the channel routing setup understandable. Channel names you provide are also displayed on the user interface to inform you about channels that are currently being adjusted by the plug-in's controls.

You can also import channel labels from the audio host application by pressing the “Import labels from host” button. However, not all audio host applications provide distinctive input channel names: in that case entering your own names manually is the only existing option (macOS AudioUnits do not provide input channel names).

Group Names

This button opens the group name assignment popup window. You may assign names to channel groups for easiness of channel group selection.

Routing Presets

The “Routing Presets” button opens a local preset list that covers settings present in the “Channel Routing” window, including channel labels. These presets are shared among Voxengo plug-ins of all types: note that due to this fact a particular preset (e.g., the one that uses mid-side pairs or external side-chain assignment) may not be applicable to a specific plug-in where the used feature is unavailable (not all plug-ins possess mid-side processing and external side-chain) – in this case such preset will be shown grayed out, with the “(n/a)” prefix.

Channel Group Selector

Almost every Voxengo plug-in features the channel group selector which allows you to select the channel group for which parameters are currently being edited or monitored.



This selector (the “Stereo”), when pressed, displays a selection of channel group names (indices, by default). Only groups actually assigned to the internal channels in the Channel Routing window are shown. You may use this control to switch between channel groups.

The “Solo” switch allows you to solo channels that belong to the currently selected group. This can be useful, if you want to focus listening on group’s channels only (for example, in the “Mid-Side Stereo” routing setup). The state of the “Solo” switch is saved between project sessions.

The “Copy” button allows you to copy parameter settings defined in another channel group, to the current channel group.

Channel Group List

 A horizontal list of channel group names: L¹, R², IN3³, IN4⁴. The text is displayed in a light beige background with a thin dark border.

A Voxengo plug-in may also present a list of input channels being routed to a currently selected channel group. This list is interconnected with the “Channel Routing” window, and displays routing settings defined by it. This list contains names of input channels, comma delimited. Internal channel name (“1”, “2”, “3”, etc.) that accepts the corresponding input channel is displayed in a superscript style (these internal channel names are also displayed on the level meters). If more than one input channel is routed to the same internal channel, the sum is displayed in the form “(IN₁+IN₂)”. Additionally, when the internal channel is assigned to a Mid-Side group, its input channels are taken into parentheses with the “m” (mid) or “s” (side) prefix: “s(IN₁ & IN₂)” which means “side part of the Mid-Side pair consisting of IN₁ and IN₂ input channels”.

When a plug-in supports side-chain, any side-chain assignments are displayed after a slash: for example, “L/scL” means that the input channel “L” is affected by the side-chain signal from the input channel “scL”.

Plug-In Settings for a Specific Plug-In

Voxengo plug-ins feature a set of settings that affect instances of the same plug-in only: they do not affect the same settings of other Voxengo plug-in types. This is convenient since this way you can select different color schemes for different plug-in types (for example, a Voxengo compressor may be colored in reds while a Voxengo equalizer may be colored in grays). The same applies to the user interface scale, metering, and other settings.

Color Scheme

The color scheme selector allows you to change the visual colors of the plug-in; the selection affects all instances of the plug-in. Color scheme switches immediately in all open plug-in instances, and instances that will be opened later. By pressing the “Edit” button you can open the detailed color scheme editor window where you can fine-tune the colors of different visual elements of the plug-in’s user interface. The “Load” and “Save” buttons allow you to load and save the color scheme from/to a disk file (with the “.ccf” extension).

User Interface Scale

By using this setting, you may adjust the visual scale of the plug-in. For example, if your screen resolution is very high (1920 x 1200 or more) you may enable the largest scale. On the other hand, if your screen resolution is low (1024 x 768) or you want to have many plug-in instances visible on the screen, having a smaller user interface size can be beneficial: in that case you may select the 80% scale. Note that the visual scale switch requires reopening of the plug-in window. The “Scale to Screen” switch on Windows enables automatic scaling based on primary screen resolution: this switch is useful, if you have an ultra-high-resolution display (4K and above). This switch nor the plug-in do not rely on scaling specified via Windows DPI setting: on HD displays it will have no effect.

Min Infrastructure

This switch enables the “minimal infrastructure” look of the user interface. Such look reduces the visual complexity of the user interface by hiding several infrastructural elements like the instance name box, oversampling selector, bypass switch, plug-in’s title on top.

Show Groups Bar

This switch (if available in a particular plug-in) enables display of a group selection bar at the bottom of the user interface.

Large Cursor Readouts

This switch (if available in a particular plug-in) enlarges the font used to display mouse position readouts on the spectrum control surface. This may be useful when the plug-in is placed on a distant dedicated monitor.

Oversampling

This selector, if available in a particular plug-in, allows you to choose the type of oversampling filter to use. Oversampling is discussed in the topic “Main Control Buttons – Oversampling Selector” above. The “Min-Phase” option selects minimum-phase oversampling filter which is easy on CPU and does not add a considerable processing latency. The “Lin-Phase” option selects linear-phase oversampling filter which is CPU-intensive and adds around 13 milliseconds to the compensated processing latency. At the same time, the linear-phase filter adds no phase coloration to the sound material while the minimum-phase filter adds such coloration (which is, however, mostly unnoticeable).

It is important to note that while the minimum-phase oversampling does not change the subjective quality of the sound when you monitor it alone, it may seriously change the sound when you mix “min-phase” oversampled sound together with non-oversampled sound, especially if the sounds are correlated to each other (e.g., mix of several drum microphone tracks). If you have faced such problem, you should either disable oversampling completely, or enable it on all tracks you are mixing, or engage the “Lin-Phase” oversampling in all Voxengo plug-ins you use.

Note that in older VST audio host applications this switch should be adjusted with care. While with most hosts a simple playback restart is enough for the change to take place, in some hosts it may require full application restart and plug-in rescan to change the processing latency. Not doing so may make tracks where the plug-in is used go out of sync. The plug-in window will show the red “Latency Changed” label, if playback restart (or application restart, or current project reload) is required due to the processing latency change that occurred.

Auto Oversampling on Render

When this switch is enabled, it forces the “Auto” oversampling mode whenever audio host application starts to render/bounce, irrespective of plug-in’s individual “Oversampling” setting. This switch applies to all instances of the same plug-in in the project.

Meter “Density Mode”

This checkbox enables “density” metering mode. In this mode you can see levels a signal stays at often. By examining the range of levels a signal stays at you may draw conclusions about effective dynamic range of the sound material. Note that signal level estimation in the “density” mode is affected by the meter’s configured integration and release times. Meter’s configured peak level hold time affects time duration a specific signal level registers on the meter in this mode.

Meter Integration Time

This parameter affects signal level integration time (in milliseconds) of all level meters (this value reflects time it takes for a signal level to fall down by 20 dB, or raise up from any steady level to another steady level). Note that this setting does not affect peak level registered on the level meters, but directly affects the visible difference between the peak and RMS signal levels when a musical signal is metered.

If you would like to measure the RMS loudness of the lower frequencies precisely you have to use a higher integration time, at least 50 milliseconds. With lower integration times (e.g., 2 milliseconds), the level meter actually measures peak levels, and not RMS, in the lower frequency range, while the RMS level of the higher frequencies (above 1 kHz) is measured correctly. So, you have to choose a balance between the precision at the lower frequencies and level meter's rise speed.

Meter Release Time

This parameter changes level meter's release time (in milliseconds), and is also known as level meter's "ballistics". This is the time it takes a signal to fall down by 20 dB. If you need 20 dB per second fall-off, the release time should be set to 1000 milliseconds.

Meter Peak Level Hold Time

This parameter adjusts time (in milliseconds) a registered 1-sample wide peak level stays on the level meter unchanged. Also affects level meter display in the "density" mode.

Global Voxengo Software Settings

Voxengo plug-ins also feature global settings that are shared among all Voxengo software types. These settings mainly customize your interaction with various controls: mouse wheel precision, knob drag precision, etc.

Auto Oversampling Level

This option selects oversampling level used by Voxengo plug-ins when the “Auto” oversampling option is selected in a plug-in instance. This option selects maximal oversampling level used. The actual used level may be lower depending on the working sample rate (the higher the working sample rate the lower the auto-selected oversampling level is). Change takes effect only after the audio host application is fully reloaded.

Note that the “Auto” oversampling is engaged only during project’s rendering stage. Some audio host applications do not report this stage to the plug-in: in this case the “Auto” oversampling setting will not function.

Mouse Wheel Precision

This setting affects a precision of the mouse wheel – the higher the precision the finer a control’s change that can be done with the mouse wheel.

Shift Key Precision

This setting affects a control change precision when the “Shift” key modifier is pressed during the drag of any control with the mouse.

Drag Precision

This setting affects precision of mouse drag operations. This setting applies to knobs, level meters and readouts only.

Tablet Mode

This switch enables “tablet” mode allowing you to control Voxengo audio plug-ins with a pen tablet. This mode can be also used, if you are operating plug-ins via remote desktop software. If this mode is not enabled, the mouse cursor will be hidden on every mouse dragging operation.

Show Virtual Keyboard

When this switch is enabled, value entry will be accompanied with a popup window showing the “virtual keyboard” you can use instead of your real keyboard to enter various values (numeric and textual). Virtual keyboard is especially useful when the audio host application “blocks” certain keys from reaching plug-in’s user interface.

Remember Window Positions

This switch allows you to enable or disable saving of window's position when it is reopened after closing. Window's position is saved relative to the parent window.

Enable Mouse Wheel On Lists

This switch enables selection of list options via mouse wheel. This option is suggested to be disabled if trackpad is in use or mouse wheel's movements are not discrete, in order to avoid erratic behavior.

Show Preset Selector

This switch displays the quick preset selector instead of instance name entry field. This option is applicable only to plug-ins that have instance name entry field.

Show Knob Labels

This switch allows you to enable or disable numeric labels that appear around the knob when you are hovering the mouse cursor over it.

Radial Knob Mode

This option enables radial operation mode in knobs. You may disable this mode, if you usually use linear (up-down) knob adjustments only.

Control Surface Crosshair

This option enables crosshair display in the plug-ins on their "control surface" areas – e.g., equalizer, spectrum analyzer.

Curve-Drag Adds Points

This switch enables automatic control point addition when EQ or envelope curves are dragged. Otherwise, only mouse double-click or "Shift+Click" can be used to add points.

Import Spectrum Filling

When enabled, in plug-ins with spectrum import feature, this option also imports spectrum's "Filled Display" setting. When disabled, the setting of the "Spectrum Mode Editor" will be used instead.

Do Not Show Latency Changes

This switch can be used to disable the "Latency Changed" warning message completely, if it becomes annoying (some audio host applications do not update latency when plug-in requests it).

VST 2 Function Sync

This switch enables internal VST 2 function synchronization that solves crash problems in some older hosts at the expense of a minor added CPU load. For example, Tracktion 3.0.4.8 may call plug-in's internal "suspend" function together with the audio processing function: this is, of course, an incorrect behavior which leads to a crash. You may enable this switch to ensure no interfering functions will be called simultaneously.

Beside Tracktion, this switch is required to be enabled in Samplitude to resolve crashes and slowdowns.

No Multi-Channel Operation

This switch forces stereo and mono (no multi-channel) operation in Voxengo plug-ins. Enable this switch, if you are using VST 2 audio host applications that do not support multi-channel VST plug-ins correctly. To take effect, this switch requires audio host application restart.

Visual Settings

Latest Voxengo software features a set of visual settings that allow you to subtly customize the look of the plug-ins. These settings are:

1. Spotlight – enables a wide light area that looks like a trace of spotlight.
2. Textures – enables texturing of the panels.
3. Shadows – enables shadows on visual elements.
4. Flat Meters – enables the "flat", non-blocky look of the level meters.
5. Show All Filters – in equalizers, this switch enables display of shapes of all active filters, together with the shape of the currently selected filter.
6. Colorize Filters – in equalizers, this switch enables display of filters in an automatically selected color.
7. Frames Per Second – specifies refresh frequency of the user interface. Note that "smoothness" of level meters and spectrum plots additionally depends on the configured audio card block size and the "Overlap" setting.
8. High-Precision Timer – this setting is available on Windows systems; engages a high-precision user interface timer which reduces visual stuttering; may use more CPU resources in comparison to the legacy lower precision timer, so FPS setting may need to be lowered. On macOS systems the user interface timer always runs in high-precision mode having minimal stuttering.

Plug-In Files' Locations

Any Voxengo software title is bundled in a separate archive or installation file for every target platform. These archives contain document files, a license agreement, a change history log, and a plug-in or application itself in the form of the dynamic link library (DLL) or the component file, or executable file, for any given target computer platform.

In order to be able to instantiate the plug-in in an audio host application you should put the DLL (component) file into the correct file folder that corresponds to the “plug-ins path” specified in that audio host application. It is suggested that you put the DLL (component) file into the “Voxengo” subfolder within the plug-in folder, for easier plug-in management.

While it is mandatory to read and agree to the supplied license agreement before using the plug-in, you may, for your convenience, put the DLL (component) file separately from its accompanying files, including the license agreement file. However, as license agreement explicitly mentions, the DLL (component) file cannot be re-distributed to other persons or companies/entities separately. You may store the DLL (component) file separately from its accompanying files for your own archival and storage convenience purposes only.

During its operation, the software also creates settings files where it stores both “global” and per-software title settings, including presets. On Windows systems the data files created by Voxengo software reside in the hidden “%APPDATA%\Voxengo\” folder; on macOS systems the data files reside in the “/Users/<UserName>/Library/Preferences/Voxengo/” folder. You may safely remove, copy, and replace these files, including the whole “Voxengo” subfolder. All Voxengo settings and presets are only available to the specific user of the computer.

Portable Setups

In addition to storing data files in the standard folder, Voxengo software is able to read and write its settings into a special “Voxengo Settings” folder, if this folder is present (was created by the user) in the same folder where the DLL (component, executable) file is located. For example, if a plug-in’s DLL file is located as the “C:\VSTPlugins\Voxengo\SPAN.dll” file, the plug-in may use the “C:\VSTPlugins\Voxengo\Voxengo Settings\” folder to store the settings. Similarly, it is possible to move and rename the standard “%APPDATA%\Voxengo\” folder to the custom “Voxengo Settings\” folder (note the appended “Settings” string).

Such custom folder can be also placed on a USB flash storage, together with other required Voxengo software, making it possible to use the software in a “portable” manner, without a requirement of re-registration/re-authorization, when the software is loaded on another computer right off the USB flash storage. You just have to make sure the portable storage has read and write permissions.

This “portable settings” functionality is also helpful, if Voxengo software is loaded under some “system user”, making usual user’s settings folder and authorization data inaccessible. For example, this situation may happen, if a plug-in is loaded by some host application as a separate background process.

Additional Information

Selecting Best Audio Buffer Size

The most efficient audio driver's buffer size (latency) to work with Voxengo plug-ins is 512 or more samples. A plug-in's internal processing overhead may become considerable at low latencies such as 64 samples – various plug-ins may require 30-100% more CPU resources to process at such low latency.

64-Bit Audio Processing

Voxengo plug-ins conform to the VST specification version 2.4 and 3+, and so they are able to interface with audio host applications in full 64-bit floating point resolution (if supported by the audio host application).

AudioUnit versions of Voxengo plug-ins are technically able to process 64-bit floating point audio data, subject to audio host application's support.

Plug-In Registration/Authorization

Commercial Voxengo software titles should be registered (authorized) before you can use them in non-demo mode. Each commercial software title contains a special area in its Settings window where user registration/authorization details can be entered. Please use the standard copy&paste functions to ensure a correct product key entry (you may right-click the product key entry field to paste the key). User name is not required for entry. When the details were entered correctly, you will see the "Registered" text in the Settings window: in this case plug-in is working in a non-demo mode. Alternatively, you can use the "automatic key download" feature to fetch the product keys (all at once) from your Voxengo user account.

CPU Load Measurement Notice

Before judging the plug-in's CPU load performance, please make sure you understand that on multi-processor (multi-core) computers CPU load metering offered by the audio host application you are using can only be approximate. The reason for this is the fact that depending on the track configuration of your project, you may get a varying maximum number of plug-ins that can work at the same time. For example, if your project consists of only a single track with a long effects sequence, you may quickly run out of CPU resources; while if you are putting these effects on parallel tracks, the maximal number of effect instances you can use may double at the least (depending on the number of your computer's CPU cores).

Also pay attention to the "Oversampling" setting of a plug-in, because running a plug-in at "4x" oversampling setting is equivalent to running 4 separate plug-in instances at "1x" oversampling setting each.

Knowledge Bit – Correlation

As you probably already know, correlation between two independent signals is defined in the range between -1.0 and 1.0, inclusive. If correlation is close to 1.0 between any two signals, it can be said that signals are “in-phase” (0 degree phase difference). If correlation is close to -1.0 the signals are “anti-phase” (180 degree phase difference). Correlation values close to 0.0 usually tell that any two signals have no correlation and so they may either be 90 degree apart or significantly delayed relative to each other, or both.

Correlation between two sinusoidal signals is equal to mathematical cosine of the phase difference between these signals.

Note that while simple sinusoidal stationary (constant) signals require only phase rotation to change correlation value, musical signals and signals which are complex in their nature may require time alignment (delaying) as well. Correlation of any signal with any independent (uncorrelated) noise signal is always 0.0 and cannot be changed by phase- nor time-alignment.

Stereo Correlation

Speaking about stereo (two-channel) signals, “acceptable” correlation value range lies between 0.0 and 1.0. Negative correlation values mean that channels are anti-phase and this usually works problematically – stereo field becomes “unreal” (“surround”) and causes disorientation. Beside that, anti-phase stereo information is not mono-compatible and such signal sounds poorly, if the listener is not placed on the central listening axis.

In order to create any useful spacious stereo-image the correlation values close to 0.0 should be achieved. Also note that an uncorrelated stereo-signal in comparison to a correlated stereo-signal at an equal peak level usually sounds louder to the listener by around 1.25 decibel, because uncorrelated channel sound coming from a speaker does not cancel channel sound coming from another speaker spaced 60-degree apart from it as much as correlated channel sound cancels it.

Knowledge Bit – Aligning Microphones

This topic discusses possible ways of achieving a good alignment between several microphones providing a maximally focused and feature-rich sound. While this topic is easier perceived from the perspective of Voxengo PHA-979 plug-in user, information contained herein can be used universally.

When you are placing a couple of microphones to capture a single instrument, this means you are creating a microphone array consisting of two microphones.

When doing microphone alignment, you should always consider only two microphones and a single sound source at a time. One of the microphones should be considered as the “master” microphone, and its delay, phase, and gain should not be changed. When working with three or more microphones in an array, each additional microphone should be aligned to the master microphone, one by one, so that only two microphones are considered at a time.

Each microphone in this array has these basic parameters: distance from the sound source, delay relative to the master microphone and phase relative to the master microphone. Relative delay can be negative meaning the sound reaches the microphone earlier than it reaches the master microphone.

All directed microphones should generally capture a single sound source or otherwise you may face problems getting all sound sources to sound good when trying to align microphones, because in such case you will have to make complex decisions to find a good balance of per-microphone phases and delays.

Alignment Steps

Aligning any given microphone in the array relative to the master microphone basically consists of three steps: 1) finding an optimal delay; 2) finding an optimal phase; 3) finding an optimal gain.

First of all, it should be said that microphone delay, phase, and gain alignment is required only if you are capturing the direct sound of an instrument with a microphone array. Microphone alignment may become unimportant or even problematic, if you are capturing “space” where the instrument is located (i.e. surround microphone array, room microphones, etc), because at longer distances from the sound source the microphones may capture room’s reflections in larger volumes than instrument’s direct sound.

Microphone Delay Alignment

This method is best used with percussive instruments that produce a sharp transient. After doing a multi-microphone recording you should inspect the recorded waveform at some high zoom setting, and write down the sample position of the transient in both the master microphone track and the microphone track you are aligning (you can also use PHA-979’s “Calculator” for this). The time difference will be the delay required to be applied for the microphone to be aligned to the master microphone track.

An alternative method of microphone delay alignment is to measure the distance between both microphones and the sound source, and divide the difference of these

distances by 344 meters per second (average speed of sound propagation in air) to obtain the delay of the microphone relative to the master microphone, in seconds. However, this method gives only approximate results, because the actual speed of sound propagation in your recording room may be unknown, and the exact distance from the microphone to the sound source cannot be usually measured precisely since it may be unknown which part of the sound source emits the sound first.

Microphone Phase Alignment

In order to find the best phase alignment (rotation) value of a recorded microphone track relative to the master microphone track, you have to put that microphone, master microphone, and a sound source on a single imaginary plane as points. Let's call these imaginary points "Z", "M", and "S", respectively. Let's "R" be the angle between the lines "S"- "Z" and "S"- "M" on that plane. Now, rotate that plane in your imagination around "S"- "M" line, preserving distances between the points, so that the line "S"- "Z" becomes parallel to the floor. Imagine that the point "Z" being at your chest. Then, if the point "M" appears left-hand of your chest you should set the phase rotation to "R", while if the point "M" appears right-hand of your chest you should set the phase rotation to minus "R".

The phase alignment should be done with the assumption that directionality axes (vectors) of all microphones are pointing directly at the sound source. If this is not the case, an additional phase rotation angle should be added to make each microphone on-axis.

Any stereo microphone pair used in configurations like "ORTF", "X/Y" or "A/B" should be treated as a single microphone, with the directionality of this pair being equal to vector sum of directionality vectors of each microphone in the pair.

Note that a microphone by design may have its polarity inverted by 180 degrees relative to the master microphone. When phase-aligning such microphone, you may need to additionally flip its phase by 180 degrees.

Microphone Gain Alignment

When doing microphone gain alignment you may use the following approach. This approach requires some simple signal or sine-wave (collectively, a "test tone") to be played from sound source's position: this can be a handclap or a sweeping sine-wave tone. Power of signal reaching each microphone can then be analyzed easily at all required frequencies to find the required gain adjustment value for each microphone. For more consistent results you may need to analyze powers of lower frequencies below 500 Hz only.

Alternatively, you can use the theoretical rule that states that the power of signal when it propagates through the air drops by 6 dB with each doubling of the distance from the sound source. E.g., if microphone A was placed 10 inches from the sound source while microphone B was placed 20 inches from the sound source, microphone B should be made louder by 6 dB to match the loudness of a signal in microphone A. Of course, for this approach to work, the microphone pre-amp gain and "sound pressure to voltage" characteristic of the microphones should be matched (or microphones of the same model should be used): this makes the aforementioned "test tone" gain alignment a preferred approach in practical situations. Also note that this "theoretical" approach does not account for any additional sound reflections that are

reaching the microphones, and which may cause interference, effectively increasing or decreasing the signal power of the recording.

High-Frequency Drop Issue

When a signal from two given microphones that were aligned and gain-compensated is being mixed, a problem of high-frequency drop may arise. This usually happens when you mix two microphones placed at different angles and distances to the sound source. The main reason of such behavior lies in the difference of propagation of frequencies in space.

While lower sound frequencies usually penetrate the matter quite easily and propagate through the space without much damping and reflections (due to a longer wavelength), higher frequencies are easily absorbed and reflected even by small obstacles. Thus, in most cases, higher frequencies from the same sound source reaching two differently placed microphones become uncorrelated, even after the microphone delay and phase alignment has been done. Due to their small wavelength higher frequencies also require only a very short time delay to become uncorrelated even if no additional absorption or reflection is taking place. The lower frequencies reaching two aligned microphones are usually correlated.

When you are mixing two correlated signals in equal proportion you get 6 dB of overall loudness gain. But when you are mixing two uncorrelated signals in equal proportion the gain can vary between 3 and 6 dB (depending on the level of correlation) causing high-frequency drop relative to the overall gain in the lower frequencies. This drop becomes bigger with each additional microphone added to the array, and, for example, may reach 6 dB when you mix signals from four differently placed microphones.

Why Go Multi-Microphone?

If you generally wonder, why one should use multi-microphone arrays instead of a single microphone when recording a sound source, you should understand that various acoustical instruments have quite complex sound emitting profile: the spectral content of a sound emitted from side, front, bottom, etc. surfaces of the instrument may be quite different.

For example, snare drum's batter drumhead side does not have much "crack" sound in it while snare drum's body side provides a lot of "crack"; on the bottom of the snare drum the sound of resonating snares is prevailing. All these aspects cannot be captured with a single microphone if one wants to achieve defined and focused recorded sound: getting such sound requires close placement of several microphones with a further time and phase alignment of the recorded microphone tracks.

Questions and Answers

Q. Why some Voxengo plug-in controls appear dimmed after a new Voxengo plug-in instantiation or after loading a previously saved project?

A. This is a normal behavior since Voxengo plug-ins use dynamic internal processes allocation. When some controls appear dimmed it means that internal processes that correspond to these controls were not created yet. Such behavior should not be seen as an erroneous one: these processes will be created when an audio playback is first started or when audio rendering is initiated, and so the visual controls will also become active then. Also note that some controls may appear dimmed naturally, if the corresponding processing stage was disabled by the user.

Q. I may hear that when I switch from the 44.1 kHz working (project) sample rate to the 96 kHz sample rate the overall plug-in's sound changes a bit. Is this normal?

A. This is an expected plug-in behavior since the working sample rate may affect several internal signal processing aspects, especially digital filter shapes. Thus, we are making an expressed disclaimer about the plug-in's sonic qualities when working at different sample rates: the plug-in may produce sonically different results working at different sample rates. However, these differences are usually minor and should not be construed as an invalid plug-in operation (bug). It should be also noted that Voxengo plug-ins are designed to work at any sample rates equal or above 44.1 kHz: lower sample rates are not supported.

Q. On multi-processor systems are Voxengo plug-ins optimized to make use of more than one processor?

A. Voxengo plug-ins do not have special multi-processor optimizations, but they work correctly, if audio host application runs two or more instances of the same plug-in on several cores/processors. This means that a single instance of a plug-in won't be spread over two cores/processors, but if you load two instances placed on different tracks/buses, they will be spread. This was tested in several hosts that support multi-processing, and the boost in performance is close to 70% in the dual-core mode, in comparison to the single-core mode.

Q. Could you please tell me an easy way to setup mid-side processing over a stereo input?

A. To setup mid-side processing, you will need to do the following: a) open the "Channel Routing" window; b) assign the mid-side pair "MS1" to channels "L" and "R"; c) assign channel "L" to group 1, channel "R" to group 2. After this has been done, the mid channel will be affected by settings defined in the group 1, and the side channel will be affected by settings defined in the group 2. Alternatively, you may simply load the "Mid-Side Stereo" routing preset that will setup the necessary routing for you.

Q. I do not seem to find the “register” icon for the plug-in that allows me to authorize the plug-in by entering the product key.

A. Latest Voxengo plug-ins are registered inside plug-in’s own user interface. Please open plug-in’s “Settings” window: you’ll see the “Enter Key” button there.

Q. If I save a preset using host application’s facilities – the name of the instance (which I can set in the text field of the plug-in) gets saved as well. So, if I change presets the instance name gets overwritten.

A. Unfortunately, when you are using host application’s own preset management, this overwrites instance name when you load any previously saved preset. This cannot be resolved as otherwise instance name will not be saved with the project at all. You should use plug-in’s internal preset manager, if you want to keep instance name unchanged when loading a preset.

Q. If I click on the frequency, say “2K” and enter a “3” then it will jump to “20.00” and never come back.

A. Please make sure you are entering “3K” instead of just “3”, because entering “3” means “3 Hertz”, and not “3 kilo Hertz”.

Q. It seems that the plug-in is taking some CPU resources even if I disable all of its stages (modules).

A. This is to be expected since even if plug-in processes nothing, it still performs some routine tasks that are considered to be plug-in’s processing overhead. Plug-in may also take additional CPU resources, if its user interface is open since level meters (and spectrums) have to be updated even in the absence of the signal. Also, the oversampling (quality) setting higher than “1x” alone makes plug-in take more CPU resources.

Q. Why the output signal metering of the plug-in looks inconsistent with the levels I see on my audio host application’s level meters?

A. This can be caused by three reasons: 1) If you are using mid-side processing the output level you see is actually mid or side channel level, it is not a final output level. This could not be implemented in a different manner because if plug-in showed only the final output signal level you would not be able to see the signal level of the mid or side channel separately. 2) If you are using the oversampling setting different from the “1x”, the signal level you see is the output signal level before the final downsampling is performed. Since after downsampling new peak overshoots may appear you may see these peaks on the host’s level meter while not on the plug-in’s one. However, these overshoots usually have a low magnitude and should not cause any problems. If in doubt, please use a peak limiter on the master bus. 3) Audio host application’s level meter integration time is different to plug-in’s one. You can adjust integration time of plug-in’s level meters in the “Settings” window.

Q. I can only see one stereo out on the plug-in, that's not right, is it?

A. This means that your audio host application does not support VST 2 multi-channel operation, or you are inserting this plug-in to a mono or stereo track/bus. Many older audio host applications limit plug-in support to 2 channels input/output only. However, this is not plug-in's limitation as it was successfully tested in hosts that support multi-channel operation.

Q. It seems that plug-in's Routing window may display up to 16 input channels while there are only 8 internal channels inputs can be routed to. This looks like a limitation, is it so?

A. Indeed, plug-in may accept up to 16 input channels (8 normal inputs + 8 side-chain inputs) while it only possesses 8 internal channels. This means one cannot use full multi-channel external side-chain signal to process multi-channel input signal. Since side-chaining is usually used for mono and stereo signals only, this limitation should not cause much inconvenience in real situations.

Q. It would be nice if there was a quicker way to shuffle through the popup list options (in the Routing window, various mode and preset selectors).

A. You may hold the left mouse button on the selector, and then release the mouse button on the required popup list option. It is a one-click way of list item selection.

Q. It seems that gain reduction meter's scale is small – down to -9 dB only. Does it mean a particular Voxengo plug-in is not designed for higher compression values?

A. Since the gain reduction meter of most Voxengo plug-ins shows gain reduction value relative to an average gain reduction in 2 second time frame, 3 to -9 dB scale is enough for most situations ranging from soft to heavy compression. In this sense, gain reduction meter shows instant compression ratio changes; that is why it can also display positive values showing moments when compression is relaxing after a period of a relatively high compressive action.

Q. Why gain reduction meter may show positive values?

A. The reason gain reduction meter may show positive values is due to the fact it shows gain reduction changes relative to 2-second average gain reduction, that is why it may fluctuate to positive values from time to time: these moments show when gain reduction becomes considerably lower than a prior average gain reduction.

Q. I can't figure out how to setup side-chain in a Voxengo plug-in.

A. If you are sending stereo side-chain signal to a plug-in, in this plug-in you have to assign Input channels IN3&IN4 to internal channels 3&4. Then you need to assign Key Signal Sources for internal channels 1&2: you should use 3&4 (3 to 1, 4 to 2). Then you'll need to mute channels 3&4, and you are done: channels 1&2 will be affected by signal in channels 3&4 (which represent side-chain inputs). Alternatively, you may load the "Stereo Side-Chain" routing preset.

Q. When loading a Voxengo plug-in into my audio host application, and opening plug-in's "Channel Routing" window, I see a single input and a single output channel only while the plug-in is inserted into a multi-channel track. What should I do?

A. Usually you simply need to press the "Play" in your audio host application once so that this application reports an actual number of input and output channels to the plug-in.

Q. Will upgrading to the latest plug-in version affect the settings for songs already in progress where previous version is being used?

A. If you are applying a minor version update (e.g., 2.0 to 2.1, 3.0 to 3.2, etc.) this will not affect settings, and the update can be considered "transparent". Major version upgrades will not interfere with your existing song settings since major version upgrades come with a different module name and they can be used side-by-side with a previous major version of the plug-in. However, next major version will not automatically "inherit" settings and presets you created in the previous major plug-in version as, technically speaking, such next major version should be perceived as a brand-new plug-in. Next major version plug-in may also feature reworked sound algorithms that may not sound exactly like a previous version at similar settings. Some major version releases that are fully backwards-compatible may have the same DLL/component file name, and they can be installed transparently, only requiring a product key re-entry.

Q. What is oversampling, and should I use "2x", "4x" or "8x" setting?

A. Oversampling allows a plug-in to run at a higher internal sample rate: this usually produces a finer sound. For 44.1kHz/48kHz audio using "4x" setting is suggested. For 88.2kHz/96kHz audio "2x" is usually enough. You do not need oversampling at higher project sample rates. The "8x" setting is an extreme setting which is available when you need an extra fine sound, especially when plug-in settings are specifically tuned to produce strong harmonic distortion.

The only benefit of oversampling in equalizer plug-ins is better EQ curves. Oversampling is generally useful with dynamics, harmonic enhancement, and saturation plug-ins (including harmonically-enhanced equalizers).

Q. When I enable oversampling in Voxengo plug-in and route its output to the same, but unprocessed track in order to sum two signals (processed and unprocessed) in a desired proportion I get weird phasing effect.

A. This is to be expected since oversampling in most Voxengo plug-ins is not linear-phase by default ("Min-Phase" instead of "Lin-Phase"). Thus, it produces a phase-shift making it impossible to sum processed and unprocessed tracks. This can be fixed by inserting the same plug-in to unprocessed track and enabling oversampling there, but keeping other aspects of the plug-in at a minimal effect setting. Or you may enable the linear-phase oversampling in plug-in's "Settings" window.

Q. I have tried to use a particular Voxengo plug-in on a track in parallel to an unprocessed copy of the same track. I have got some phase cancellation effects when summing these tracks. What is going wrong?

A. Voxengo plug-ins, depending on the algorithm, may produce some amount of phase-shift across the frequency spectrum. This is especially true when oversampling was set to any value above “1x” (if a plug-in is not using linear-phase oversampling). While this should be considered a normal behavior, it may stop you from using the “parallel compression” technique and the likes. To avoid this problem, many Voxengo plug-ins feature the “Dry Mix” parameter which implements a built-in dry/wet signal mix control. If you still need to implement a dry/wet mix control by means of mixing of two tracks, you have to insert an instance of the same plug-in to the “dry” (unprocessed) track and use neutral settings in that instance together with the same oversampling setting.

Q. Is there any way to change the default setting, the way the plug-in loads? I would like to set some specific parameters every time I first launch the plug-in.

A. Please use the “Set as Default” function in plug-in’s own Preset Manager to set a new default plug-in state.

Q. How can I get -48 (-96) dB per octave low- and high-pass filters?

A. All you need to do is add as many -24 dB per octave filters as necessary, all tuned to the same center frequency. For additional convenience, you may put each filter to its own Gain value so that you can have a single-click access to every filter. Do not forget that you can also select all filters in order to move them together.

Q. I’m not sure whether it is a bug or not but should the Underlay spectrum follow the same Block size as the Main spectrum? Currently, no matter which Block size I set, the Underlay spectrum block always stays at 2048.

A. You have to copy spectrum mode settings from the current group to the underlay group – this can be done by switching to the underlay group and using the “Copy” function in the group selector on top of the user interface.

Q. I’m now evaluating one of the Voxengo equalizers, and I was hitting upon some strange behavior when using it. I used two “Peaking” filters with a Gain setting of about -3dB and a rather wide bandwidth. What I’ve got is that with the equalizer “on”, the track’s peak level was higher than with the equalizer “off”. I do not get this.

A. All filters usually produce additional oscillation (known as Gibbs phenomenon) or phase shift, thus increasing momentary peak levels while the average power of the signal may become lower. This fact should not be considered as a flaw – it is how mathematical side of signal processing “works”.

Q. The metering in some Voxengo plug-ins is ahead of my audio.

A. This is a known issue which cannot be fixed from plug-in's side as there is no function for such compensation available in VST and AudioUnit specifications. The reason for this issue is that the plug-in does not know the total processing latency induced by all latency-compensated plug-ins on all tracks in the project. However, Voxengo plug-ins that induce the processing latency themselves compensate the visuals correctly – but likewise cannot compensate for the latency induced by all other plug-ins.

Q. I have a constant amplitude “swept sine wave” file that I use for testing purposes that sweeps from 20Hz to 20KHz over a period of 10 seconds. When I play this file in my DAW (Cubase 6) the meters show a steady amplitude from start to finish. When viewed in Voxengo spectrum analyzer, however, the display is “flat” out to about 2KHz then starts dropping off with a linear slope, meanwhile the meters show constant amplitude. Why isn't the spectrum display “flat”?

A. Voxengo spectrum analyzers use FFT analysis which analyses blocks of audio that are constant in length (e.g., 2048 samples). The blocked nature of analysis produces an “increasingly averaging” effect over higher-frequency spectrum data hence the higher frequencies show up as dampened. This is an unavoidable behavior, which shows up on such dynamic “swept sine wave” signal, but which is absent when you analyze constant tones.

Q. One issue I've found with routing is that channel names are reset to their default values every time I load the project. How to fix this?

A. This is a known issue which can only be fixed by changing the name of the first channel group to any non-default value. The default values are “1”, “G1”, “G-1”, “MONO”, “STEREO”, “ALL CH”, “MULTI”.

Q. When I use GlissEQ or SPAN Plus to look at different audio spectrums at the same time I've noticed that any volume adjustments made on the track faders have no effect on the levels within plug-in. Why is that?

A. It depends on whether you insert the plug-in that exports the spectrum “pre-fader” or “post-fader”. In the “pre-fader” mode the plug-in that exports a spectrum can't account for track volume itself.

Q. Just setting up SPAN (or any other Voxengo EQ), there's a red line that cuts the vertical EQ off at about 24kHz. Does that line represent the highest frequency that my audio host application can receive or is this SPAN's preference? Can this be removed?

A. This line depends on audio host application's working sample rate at which it feeds the audio to the plug-in, this is not plug-in's own preference. This line is a representation of project's sample rate, so removing it won't change the technical side of things. You may adjust its appearance via the “Color Editor” (the “Max frequency line” color).

Q. Why does “Shift” + mouse not move the cursor in Voxengo equalizers in very small increments?

A. Mouse cursor you see on the screen is not affected by the “Shift” key since it is technically impossible to affect operating system’s cursor precision programmatically. The “Shift” key makes an effect when you drag control points, knobs, or sliders only. During drag, the cursor is hidden, but it actually moves as usual, it is just not visible. The higher-precision movements are simulated by Voxengo software.

Q. When I render or bounce a project, the following message appears in a plug-in: “Off-Line Render”. What is the meaning of this?

A. It is an informational message only; it means that a plug-in detected the render/bounce mode, and if the oversampling setting in a particular plug-in was set to “Auto”, the built-in oversampling was engaged.

Q. Why the main level meter reading is 20-30 dB higher than that of the spectrum?

A. The summary “main” signal is usually louder because it is a sum of a lot of individual spectral components that are, individually, are quieter.

Q. It sounds like processing latency is not reported correctly in the “Min-Phase” oversampling mode.

A. “Min-Phase” oversampling mode’s latency is very low to have a considerable impact on the sound, but it is not an integer number, it is fractional and non-linear: so, some phase issues are to be expected, if oversampled and non-oversampled copies of the same sound are being mixed. Unfortunately, this fractional latency cannot be easily fixed. You may consider switching to the “Lin-Phase” oversampling mode instead.

Q. While entering the product key I’ve mistyped my name. Now I have a plug-in registered with the wrong name. How can I fix this?

A. A previously entered name cannot be changed from plug-in’s interface. You can re-enter your name and key after manually deleting key files from the “%APPDATA%\Voxengo\Audio Plug-Ins\

Q. Is it possible to see (in a particular Voxengo plug-in) the input (unaltered) and output (equalized) spectra simultaneously, to see the difference?

A. Voxengo plug-ins in general do not display the input spectrum as to not clutter the looks. So far, displaying the input spectrum is not a frequently-requested feature since interaction with the output spectrum is usually enough to get desired results. Moreover, the EQ curve already displays the difference between the input and output spectra, directly.

Q. It looks like none of the Voxengo plug-ins feature an EQ auto-gain compensation? Why is that?

A. As most Voxengo plug-ins feature an output level meter with the “out/in” indicator (input-to-output loudness difference), adding an EQ auto-gain compensation (or auto-gain on any other stage) is unnecessary: it is enough to click on the “out/in” value to match the output loudness to the input loudness.

Happy sound processing!

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