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## Voxengo SPAN Plus User Guide



Version 1.4

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

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## Introduction

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SPAN Plus is a real-time “fast Fourier transform” audio spectrum analyzer plug-in for professional music and audio production applications. For the most part it was derived from Voxengo GlisseEQ dynamic parametric equalizer and reproduces its spectrum analysis functionality. SPAN Plus is an extended version of the freeware SPAN plug-in: SPAN Plus provides several additional features such as PNG file export, real-time spectrum import/export and static spectrums display.

SPAN Plus provides you with a very flexible “mode” system which you can use to setup your spectrum analyzer preferences. You may specify Fourier block size in samples, FFT window overlap percentage, spectrum's visual slope. Beside that you can choose to display secondary spectrum of a desired type (e.g. real-time maximum, all-time maximum). Spectrum can be smoothed out visually for an easier examination.

SPAN Plus supports multi-channel analysis and can be set to display spectrums from two different channels or channel groups at the same time. Spectrum's color can be chosen to taste.

SPAN Plus also features output level metering with adjustable ballistics and integration time, K-system metering (including calibration K-system metering). SPAN Plus displays level metering statistics, headroom estimation and clipping detection. Correlation metering is available as well.

## Features

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- Real-time spectrum import/export
- PNG file export
- Static spectrums display
- Output signal power statistics
- Spectrum smoothing
- User interface window resizing
- Clipping statistics
- Correlation meter
- K-system metering (unweighted)
- Stereo and multi-channel analysis
- Mid/side analysis
- Internal channel routing
- Channel grouping
- Preset manager
- Undo/redo history
- A/B comparisons
- Contextual hint messages
- All sample rates support

## Compatibility

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

This plug-in is compatible with Windows (32- and 64-bit Windows XP, Vista, 7, 8, 10 and later versions) and Mac OS X (10.6 and later versions, 32- and 64-bit, Intel processor-based) computers (2 GHz dual-core or faster processor with at least 2 GB of system RAM required). A separate binary distribution file is available for each target computer platform for each audio plug-in specification.

## User Interface Elements

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

### Spectrum

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This bigger panel displays the spectrum (in the specified color) of the current channel group. Note that the secondary spectrum is displayed in a darker color. You may use the “narrow-band sweeping” mode by holding the “Ctrl” (“Command” on Mac OS X) key.

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

The “Underlay” selector allows you to add an additional underlying spectrum (in a specified color) from another channel group of the current plug-in instance. If you would like to see spectrums of left and right channels together, please load the “Dual Mono” routing preset and set the “Underlay” selector to “Right”.

You may right-click on the spectrum to copy the current frequency pointer value to the clipboard (you may then paste it to an equalizer).

The “Hide Meters and Stats” switch hides all meters and statistics panels and extends the spectrum analyzer panel.

The “Save as PNG” button saves current spectrum display to a PNG file.

The “Static” button opens the “Static Spectrums Editor” window – for an in-depth information, please refer to the “Voxengo Primary User Guide”.

The “Import/Export” button opens the spectrum import/export settings window.

The “Mode” selector allows you to select and edit spectrum’s display mode. Please refer to the “Voxengo Primary User Guide” (namely, the topic called “Standard Controls – Spectrum Mode Editor”) for in-depth information about spectrum mode settings.

Note that by default SPAN Plus uses 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.

### Import/Export

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If you would like to perform cross-track spectrum monitoring, first of all, you have to put SPAN Plus on every channel you would like to monitor.

The “Export To” selector specifies destination slot where the real-time spectrum of the current channel group should be exported to. If you do not plan to import this real-time spectrum in other SPAN Plus plug-in instances it is suggested to leave the “Export To” setting at “---” (off) so that this feature does not tax the CPU. When using the export function it is suggested that you give a distinctive name to plug-in’s instance (e.g. “Bass Guitar”, “Vocals”, “Drums”) so that this name is recognizable in the “Import From” lists within other SPAN Plus instances.

The group of “Import From” selectors allows you to import real-time spectrums from other SPAN Plus instances. If no plug-in instances are exporting their spectrums the “Import From” list will be empty. Imported spectrum’s color will be the same as selected in the exporting plug-in’s instance. Note that imported spectrum’s resolution and type (average, maximum, etc.) solely depends on the spectrum mode selected in the plug-in instance that exported this spectrum.

For example, if you would like to see spectrums of “bass” and “drums” tracks together with the “vocals” track, you have to put SPAN Plus plug-in instance to each of these tracks. Then set the “Export To” values in the plug-in instances on the “bass” and “drums” tracks, and set two “Import From” selectors in the plug-in instance on the “vocals” track.

Note that you need to avoid situations where any two instances of the plug-in use the same “Export To” slot: this situation can happen if you load a preset or copy plug-in’s instance with a predefined “Export To” value; the “Export To” selector itself will not allow you to select non-vacant slots. While such situation is not critical, it will produce uncertain results (unexpected imported spectrum and coloration).

## Statistics

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This pane displays historic (since the last reset or playback start) statistical information for each channel of the currently selected channel group.

The “RMS” indicator displays un-weighted RMS signal power estimation.

The “Max Crest Factor” indicator shows maximum crest factor (difference) between the RMS and peak RMS values reached. Peak RMS value is not displayed anywhere on the user interface. 50 ms time window is used to estimate the peak RMS value. You may add the “RMS” and “Max Crest Factor” values together to obtain a peak RMS value. Note that when comparing the “Max Crest Factor” value in SPAN Plus to other plug-ins the peak RMS time windows should be matched in the plug-ins in comparison or otherwise the readings will be different, with shorter peak RMS time window (e.g. instant peak value) showing a greater “Max Crest Factor” value.

The clipping indication is useful when using noise-shaping at low bit depth dithering settings since noise becomes powerful enough to go over 0 dBFS.

The “Peak” indicator displays 1-sample output peak level.

The “Reset” button can be used to reset counters and start statistical accumulation over.

The “Metering” selector allows you to choose the meter biasing mode. The “dBFS”, “dBFS.30” and “dBFS.15” modes apply no biasing. These three modes have a differing level meter range. The “dBFS+3” mode adds 3 dB to level meter indicator, the “RMS” values (peak level indication is unchanged in comparison to the “dBFS” modes). The “K-20”, “K-14” and “K-12” modes offer various K-system biasing modes

originally offered by Bob Katz. The “K-20 C”, “K-14 C” and “K-12 C” implement level calibration modes. In these “K” modes level meter’s RMS integration and release time constants are fixed to 600 ms as per K-system specification. Weighting is not used in all metering modes.

## Correlation Meter

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This panel contains meter that shows average real-time correlation between two first input channels.

This panel also shows the average balance (in decibel) between two first input channels during the last 3 seconds. Negative values tell that the first (left) channel is louder by the specified number of decibels.

Please read the topic named the “Knowledge Bit – Correlation” in the “Voxengo Primary User Guide” for a specific information on correlation values and their possible meaning.

## Credits

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

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

This plug-in is implemented in multi-platform C++ code form and uses “zlib” compression library (written by Jean-loup Gailly and Mark Adler), LibLZF by Marc Alexander Lehmann, filter design equations by Magnus Jonsson, VST plug-in technology by Steinberg, AudioUnit plug-in SDK by Apple, Inc., Intel IPP and runtime library by Intel Corporation (used under the corresponding licenses granted by these parties).

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