Voxengo BMS User Guide

Version 2.6

https://www.voxengo.com/product/bms/

Contents

Introduction

BMS is a bass management system plug-in for professional surround sound applications. BMS is able to extract and manipulate low-frequency content of non-LFE channels in up to 7.1 surround configurations.

The main purpose of BMS is to simplify evaluation of low-frequency content present in non-LFE channels during mastering. At the same time, it is possible to mix extracted low-frequency content to the LFE ("Low Frequency Effects") channel. An option to remove the extracted signal from non-LFE channels is also available.

In BMS you can specify a desired frequency of the crossover filter, and adjust its steepness.

Features

- Adjustable crossover frequency
- Adjustable crossover steepness
- Up to 7.1 surround configurations
- 64-bit floating point processing
- Preset manager
- Undo/redo history
- A/B comparisons
- Contextual hint messages
- All sample rates support
- Zero processing latency

Compatibility

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

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

User Interface Elements

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

Crossover & Gains

The "Xover Freq" parameter adjusts crossover frequency (in Hertz). The plug-in manipulates signal content of non-LFE channels which is below this frequency.

The "Xover Steep" selector allows you to choose crossover filter's steepness in decibel per octave. This value applies to both low- and high-pass counterparts of the crossover filter. The crossovers usually found in acoustic systems use either -12 or -24 dB/octave steepness. -60 and -72 dB/octave filters are extreme and are rarely used due to their exaggerated phase delay. Note that BMS implements Linkwitz-Riley crossover filters with the minimum-phase response.

The "Mix Gain" parameter adjusts the loudness (in decibel) of the low-frequency content when it is mixed to the LFE channel.

The "LFE Gain" parameter adjusts the loudness (in decibel) of the LFE channel, including the premixed low-frequency content. By using the right mouse button when changing this parameter you can engage the inversely-linked change of the "Mix Gain" parameter.

The "LF Gain" parameter adjusts the loudness (in decibel) of the low-frequency content in all non-LFE channels, after it was moved or mixed to the LFE channel. This parameter is useful when you are using the "Mix" channel management option: you can mix the low-frequency content to the LFE channel and at the same time leave it at a lower level in the non-LFE channels. Note that this parameter does not affect channels that use the "Bypass" management mode.

Channel Management

This panel allows you to select management modes for individual channels. The following modes are available for your choice:

- "Def": use the mode specified by the "Def Mode" parameter.
- "Move": move the low-frequency content of the channel to the LFE channel. This mode removes the low-frequency content from the channel.
- "Mix": mix (copy) the low-frequency content of the channel to the LFE channel.
- "Mute": mute the low-frequency content of the channel completely.
- "Bypass": do nothing with channel's low-frequency content.
- "Mon": monitor the low-frequency content of the channel. This switch works as a "solo" switch for the low-frequency content: when this switch is enabled, it mutes all other channels that do not have the "Mon" mode selected for them. The original contents of the LFE channel are also muted, unconditionally.

This mode also mutes the high-frequency content on all output channels completely. The signal being monitored is moved to the LFE channel.

The "Def Mode" parameter selects which mode to use for channels whose mode was set to "Def".

The "LFE Chn Index" parameter specifies index of the input channel within the surround channel configuration that carries the LFE signal. Note that if the specified index is out of range of available channels, the last available channel will be actually used as the LFE channel.

The "Mute LFE Highs" switch enables removal of high-frequency content above the crossover frequency from the LFE channel. In the essence, when this switch is enabled, the LFE channel is processed by the low-pass filter tuned to crossover's frequency and having the same slope.

If you would like to create an LFE channel out of existing stereo or 5.0 stems, you will have to insert an empty (silent) LFE channel into the stem and then apply BMS to the resulting 2.1 or 5.1 mix. BMS itself is unable to create a new physical LFE channel: it can only work with a pre-existing LFE channel.

Credits

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

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

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

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Questions and Answers

Q. When using the "MIX" mode it seems that BMS changes the audio in the main channels causing overloads on mastered mixes.

A. This is an expected behavior, because when low-frequency information is extracted from the source signal, it passes through the crossover filter which affects both LFE and main channels. As crossovers are not linear-phase, the main channels have to pass through the filtering as well or otherwise LFE channels may become out-of-phase with the main channels.