



POLYSPECTRAL

POLYSPECTRAL MBC USER'S MANUAL

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Installation

Download Polyspectral MBC from the Polyspectral website and install it in the Plug-Ins section of the Wwise launcher by using the “Add from archive...” option. If you have multiple Wwise versions you would like to use the plugin with, it needs to be installed separately into each Wwise version.

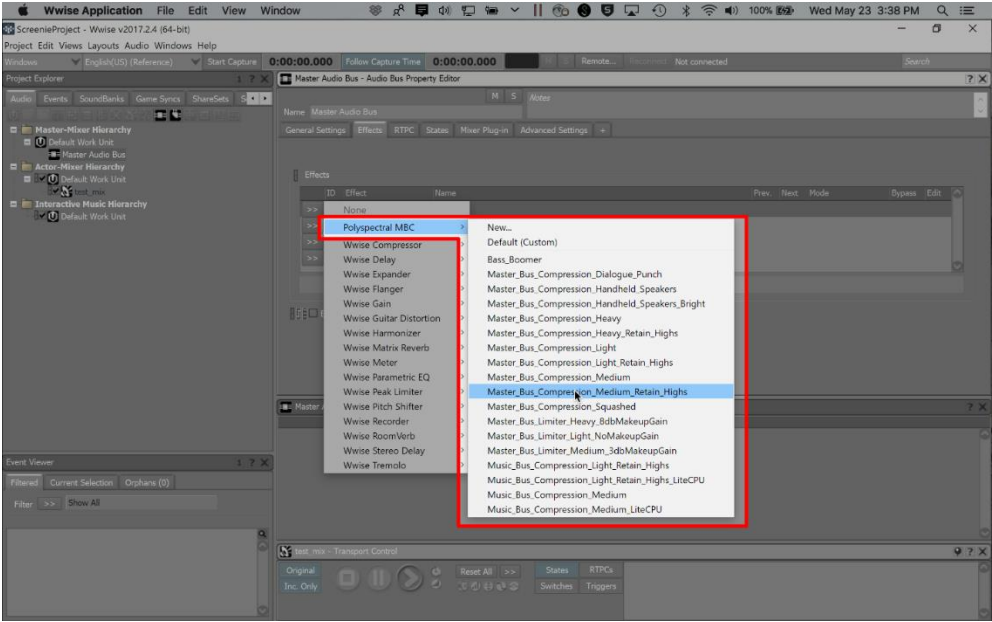
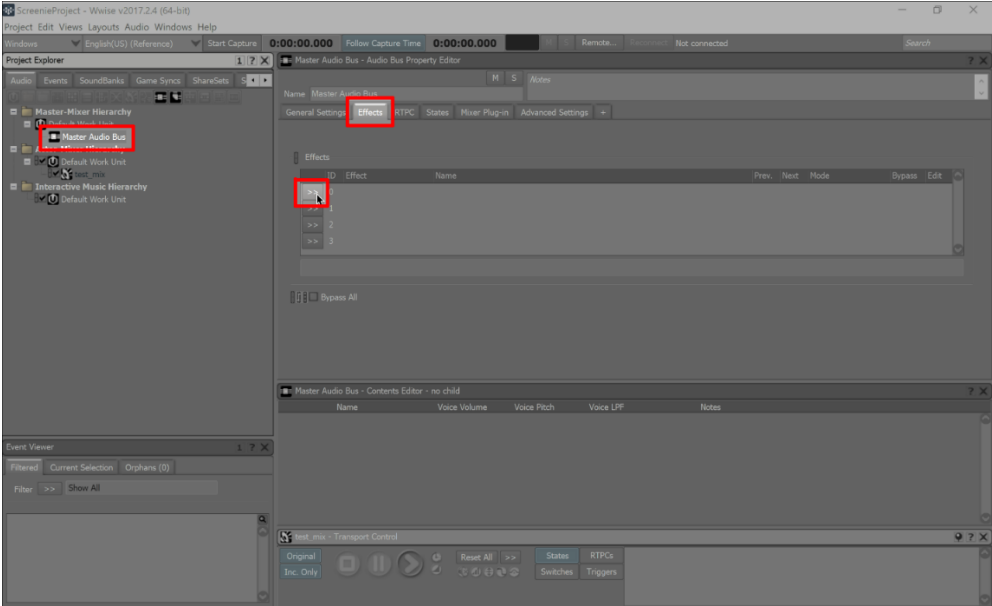
Note that under the terms of the license agreement, you may install and evaluate the plugin for no charge. However, to include the plugin in a commercial project you will need to pay a license fee for each game using the plugin, and for each platform the game will be released on.

Presets

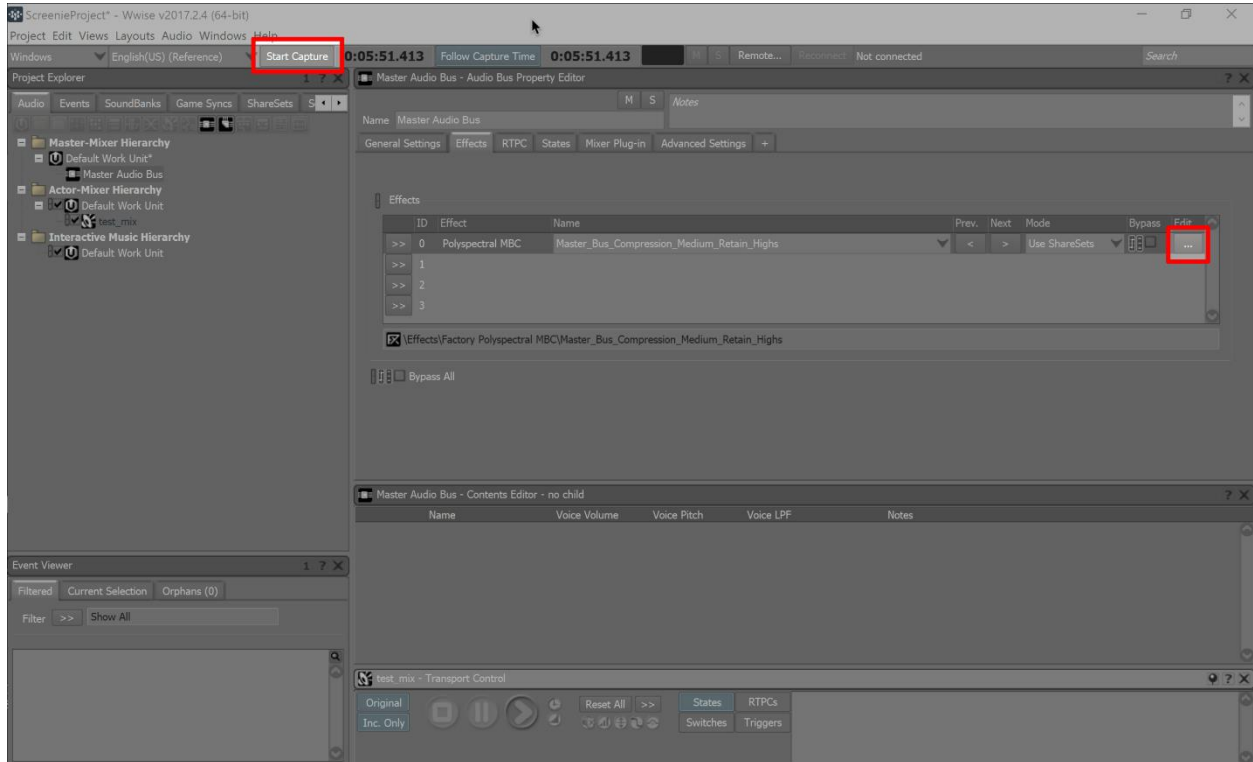
A collection of effect presets is included when you install Polyspectral MBC. When starting a new project, you will have the option of including them along with other factory content. To add the presets to an already existing Wwise project, use the “File / Import Factory Content...” menu option and select the “Polyspectral” content.

Using the Plugin

Add the plugin the same way you would add any effect plugin in Wwise, using the “>>” button in the “Effects” tab as shown in the screenshots below. Usually it will be placed on a bus in the Master-Mixer Hierarchy, perhaps on the master bus. However, multiple instances of the plugin can be used and they can be placed anywhere in a project hierarchy.

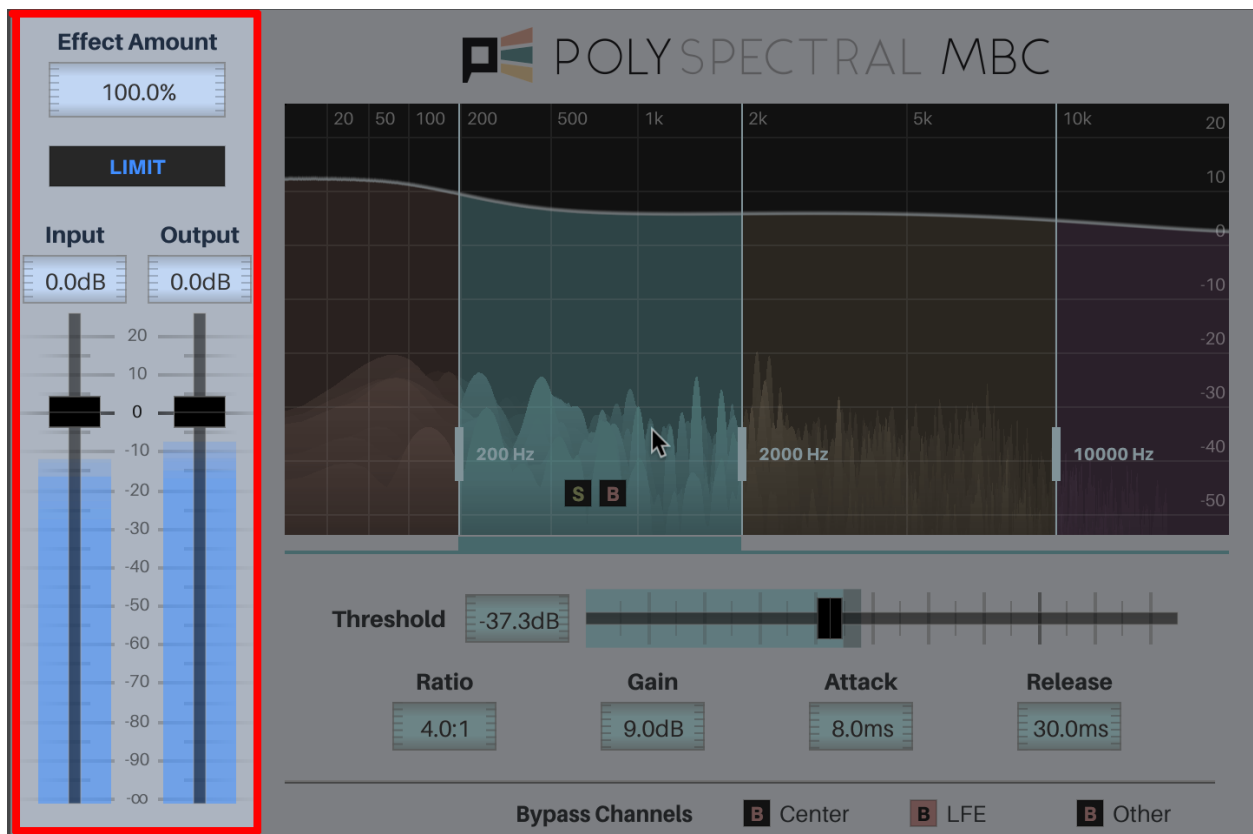


Open the effect settings panel by pushing the “...” button shown in the following screenshot. Here all of the plugin's settings can be tuned. To aid in visualizing your sound and the plugin's impact on it, there is also a realtime spectral display. This display is only active when the “Start Capture” button in the Wwise UI has been pushed (also shown below).



Global Settings

The overall behavior of the plugin can be tuned using the settings on the left side of the settings panel.



- **Effect Amount:** Use this setting to quickly fine-tune the overall amount of compression applied.
- **Limit:** When this setting is enabled, the output will never go above 0dB. This is useful when you are using Polyspectral MBC as a final-stage limiter, because it prevents any downstream limiting from occurring.
- **Input Gain:** Adjust this to apply a gain to the signal before it reaches the per-band compressors. Increasing this will mean the compressors will be engaged at lower signal levels, so there will be more compression. Conversely, decreasing it will mean less compression and only at higher signal levels.

- **Output Gain:** Use this control to adjust the final output level. When “Start Capture” is engaged you can use the meters displayed on the Input Gain and Output Gain sliders to compare the peak levels of the input and output signals.

Sidechain Mode

Normally the compression in each band is driven by the input signal in that band. The band compressor is engaged only when the signal in the band reaches the threshold.

In contrast, when sidechain mode is engaged by turning on the **Sidechain** toggle in the global settings, the compressors are instead driven by an RTPC parameter. Note that this is different from the way sidechain inputs usually work in a DAW, in which the compressor is triggered by a separate audio input signal.

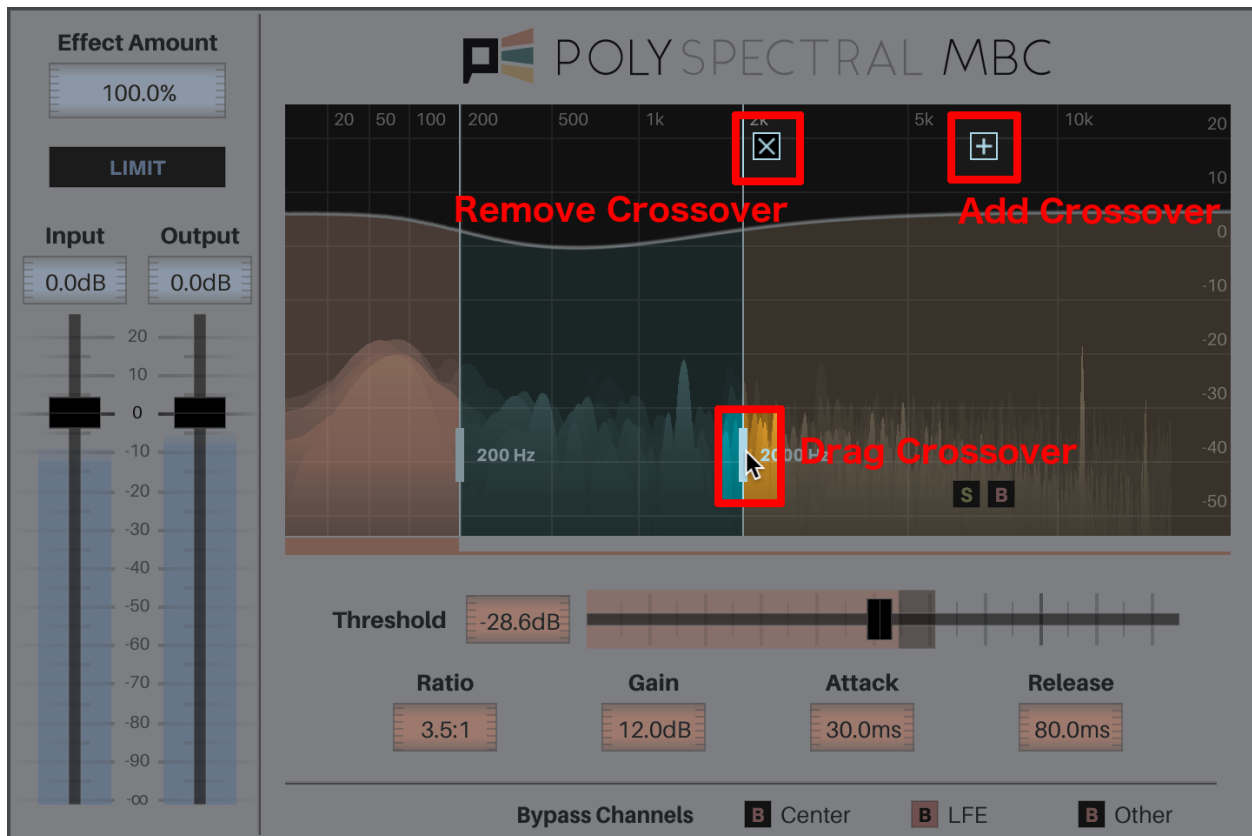
To set up sidechain compression using Polyspectral MBC, follow these general steps:

- Create a game parameter to represent the sidechain level. -100 to 20 (representing decibels) is a reasonable range for the parameter.
- Create an instance of the Wwise Meter effect and place it on the bus that will be used as the reference signal. For example, this might be a dialogue bus. A preset called **Dialogue_Bus_Sidechain_Meter** has been included as an example.
- In the Wwise Meter settings, associate the meter with the game parameter using the “Output Game Parameter” section. Match the range specified here to the range of the parameter.
- Create an instance of Polyspectral MBC on the bus to be compressed. For example, this might be a mix of all non-dialogue audio, which should be ducked when any dialogue is playing.
- Make sure the “Sidechain” toggle is active in Polyspectral MBC and set band parameters as desired. Alternatively, several presets have been provided for this purpose, named **Master_Bus_Compression_Dialogue_Sidechain_XXX**.
- Add an RTPC parameter to the Polyspectral MBC instance, mapping the game parameter to the parameter named “Sidechain Input Level.” A simple linear map is a good option, e.g. mapping -100 to -100 and 20 to 20.
- For more general information on using sidechains in Wwise, see [this page in the Wwise Documentation](#).

Crossovers

For many uses, starting with a preset and tuning the global settings will be enough to dial in the sound you're looking for. For more fine-grained control, the compression settings for each frequency band can be adjusted independently.

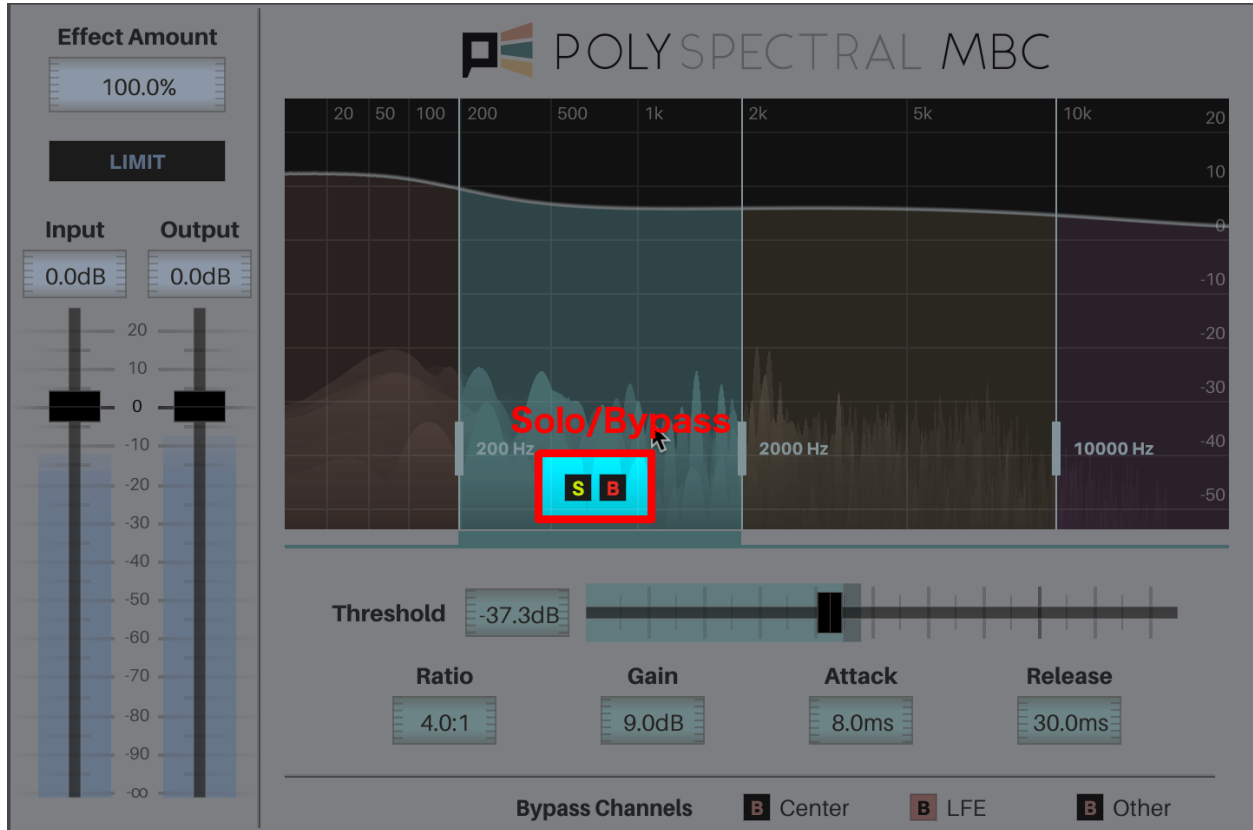
The frequency range is divided into up to four bands, separated by vertical lines at the crossover frequencies. To add a frequency band (if there are fewer than four), hover the mouse cursor in the highest frequency band and press the “+” button as shown in the following screenshot. To remove a frequency band (if there are at least two), hover the mouse cursor near the highest crossover indicator and press the “X” button.



The crossover frequencies can also be adjusted by clicking and dragging the crossover indicators, at the thicker section near the bottom.

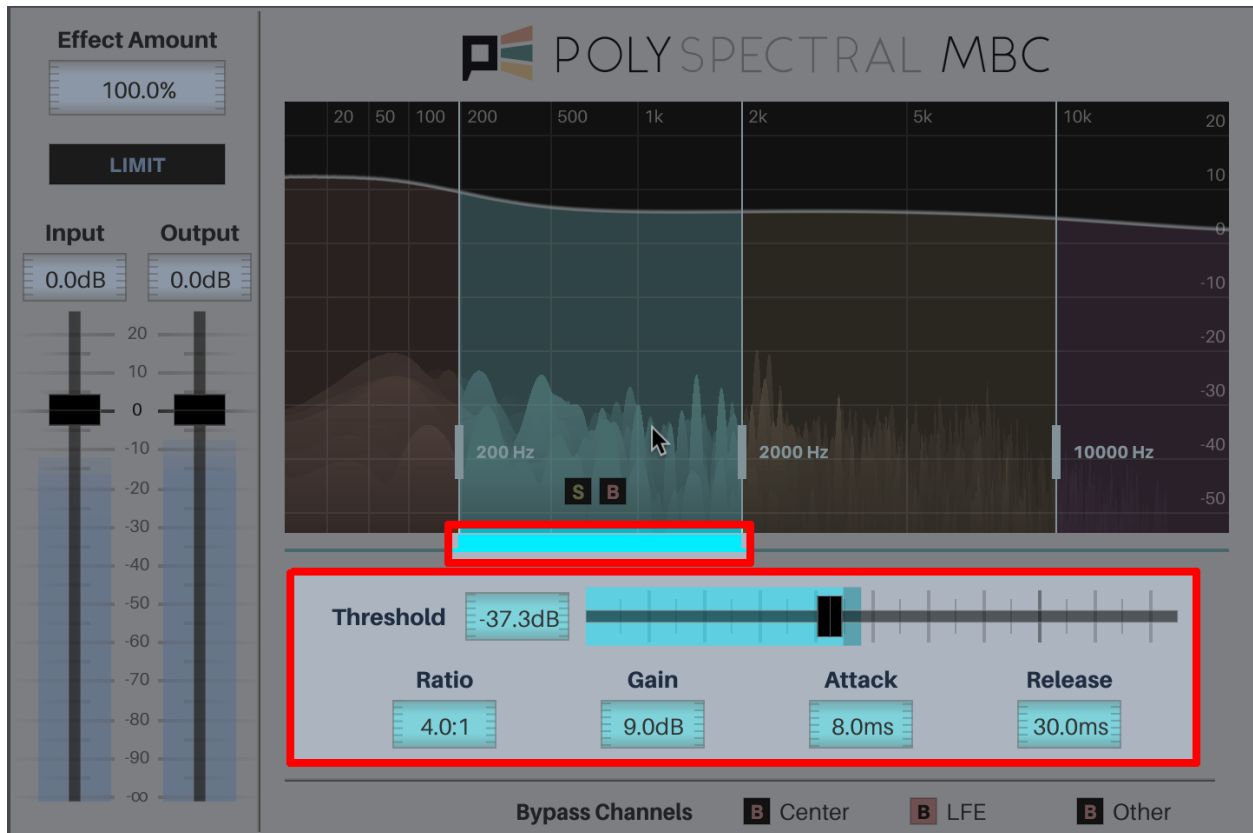
Per-Band Settings

To hear a single frequency band in isolation, or to temporarily turn off compression for a frequency band, use the solo and bypass toggles. These are the “B” and “S” icons that appear when hovering the mouse cursor over the spectrum display.



The compression settings below the spectrum display apply to only one of the frequency bands, the active band. To select a frequency band as the active band, click on the band in the spectrum display. The active band is indicated in several ways:

- It is brighter in color than the other bands.
- The color of the compression settings changes to match the color of the active band.
- The active band indicator appears just beneath the band, above the compression settings.



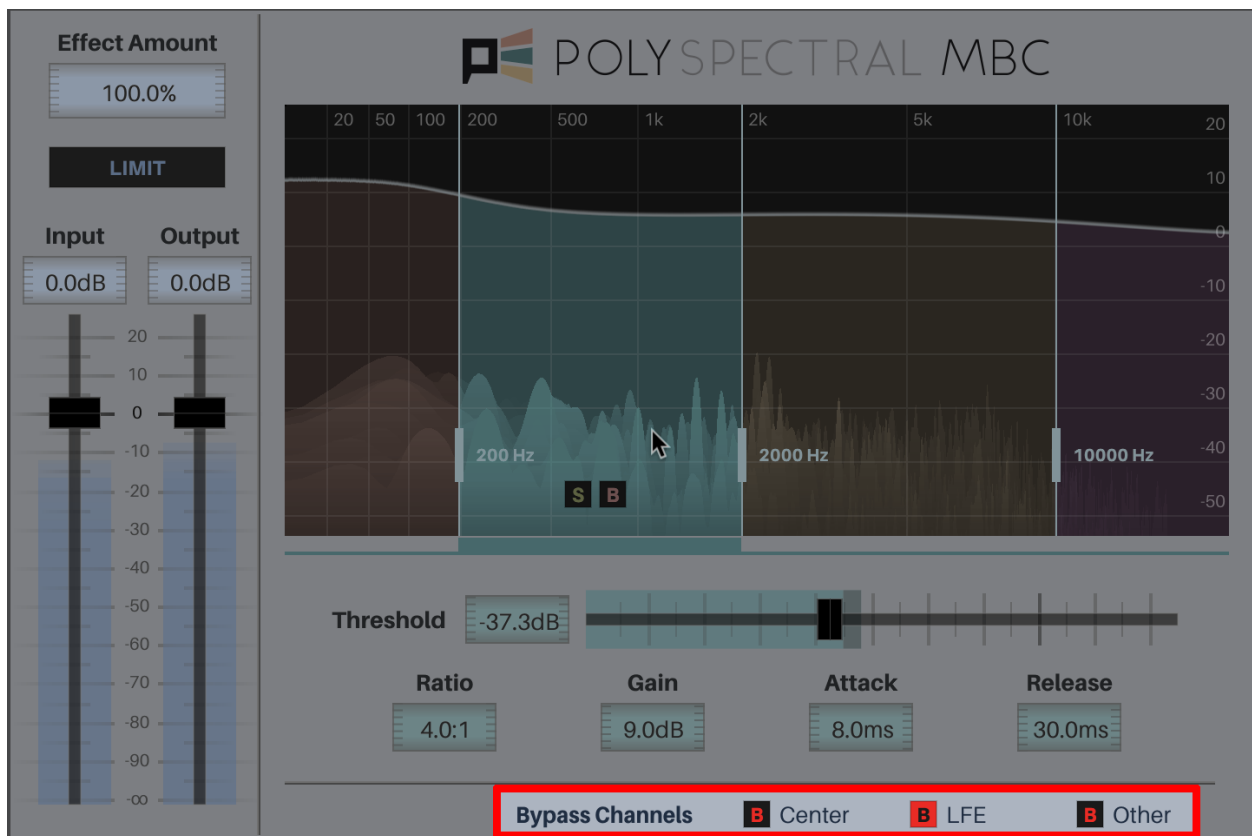
When the desired band is selected, use the controls below the spectrum display to edit the compression settings:

- Compression will be engaged when the signal level in the band is above the **threshold**. The threshold meter also shows the level of the signal in real time. The dark part at the end of the meter shows the amount the signal is reduced by.
- The **ratio** determines how much compression is applied to the signal, relative to the threshold. For example, if the ratio is 3.0:1 and the input signal is 9dB above the threshold, the output signal will be $9\text{dB} / 3.0 = 3\text{dB}$ above the threshold. Thus the signal will be reduced by 6dB.
- **Gain** is a make-up gain that is always applied to the band. It is applied after the signal is compared to the threshold.
- **Attack** and **release** determine how quickly compression will be applied when the signal is above the threshold, and how quickly it will be reduced when the signal is below the threshold, respectively.

Surround Support

To avoid changing the apparent 3-D position of sounds, Polyspectral MBC always operates in channel-linked mode. The same gain is applied equally to all channels at once. Because of this, all channel configurations are equally well supported, including Ambisonic configurations.

To better support traditional surround layouts, the plugin includes the option to bypass processing on **LFE** and **center** channels. These channels will simply be passed through unaltered. It is also possible to bypass processing on all **other** channels — that is, all non-LFE, non-center channels. This can be useful if you want to apply multiband compression to the center channel but want to handle it separately from all the other channels.



Game Engine Integration

Unity

To use Polyspectral MBC in a Unity project, first make sure the Wwise Unity Integration has been installed into the project.

Then it's simply a matter of copying one or more files from the Wwise installation folder into your Unity project's assets folder. Which files are needed depends on the target platform:

- For **Windows**,
copy `PolyspectralMBC.dll` from `(WwiseRoot)/SDK/x64_vc120/Profile/bin/` into `(UnityProject)/Assets/Wwise/Deployment/Plugins/Windows/x86_64/DSP`.
- For **iOS**,
copy `PolyspectralMBCFXFactory.h` from `(WwiseRoot)/SDK/include/AK/Plugin` into `(UnityProject)/Assets/Wwise/Deployment/Plugins/iOS/DSP`. Then
copy `libPolyspectralMBCFX.a` from `(WwiseRoot)/SDK/iOS/Profile-iphoneos/lib` into this same folder.
- For **Mac**,
copy `libPolyspectralMBC.dylib` from `(WwiseRoot)/SDK/Mac/Profile/bin` into `(UnityProject)/Assets/Wwise/Deployment/Plugins/Mac/DSP`. Then rename this new file (changing only the extension) to `libPolyspectralMBC.bundle`.
- For other target platforms, follow the same pattern as for Mac, leaving out the renaming step. Copy the Polyspectral MBC plugin file from `(WwiseRoot)/SDK/(Platform)/Profile/bin` into `(UnityProject)/Assets/Wwise/Deployment/Plugins/(Platform)/DSP`.

Unreal

Audiokinetic provides instructions for using the plugin with Unreal Engine [here](#).

Other

To use with another game engine, integrate the same way you would any Wwise plugin. You can use either static or dynamic linkage.

For static linkage, include the file `PolyspectralMBCFXFactory.h` into any C++ file in your game. You will also need to link against the Polyspectral MBC static library (the name varies depending on platform) located in the Wwise SDK installation.

For dynamic linkage, include the relevant Polyspectral MBC dynamic library file from the Wwise SDK installation (the name varies depending on platform) with your game build. Call the `AK::SoundEngine::RegisterPluginDLL` function to load this library and register the plugin at runtime.

See Audiokinetic's Wwise documentation for further details.

Acknowledgments

Some presets were created by Duncan Watt at [Fastestmanintheworld Media](#).

Polyspectral MBC contains several open-source libraries, but only in the authoring GUI component of the plugin, not in the redistributable libraries that will be included in your game. See below for details:

This software (specifically `PolyspectralMBCAuthoring.dll`) contains the following open-source libraries:

jsoncpp

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zlib

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