

---

## Introduction

BalanceEQ is an intelligent equalizer plugin designed to help you achieve a well-balanced and natural sound without the need for complex manual adjustments. Unlike traditional parametric or graphic EQs, BalanceEQ employs an adaptive algorithm that analyzes the incoming audio in real-time and automatically adjusts frequency bands for optimal spectral balance.

The concept behind BalanceEQ is simple: many sounds and mixes suffer from spectral imbalances that can make them muddy, harsh, or unbalanced. Some tracks might sound too dark, others too bright, or lacking in certain frequency ranges. BalanceEQ takes care of all of this without requiring any manual tweaking.

As soon as you load it onto a track, the plugin enters analysis mode and begins monitoring the signal. After a few seconds, it identifies spectral characteristics and applies the necessary adjustments to bring the balance closer to a neutral response, based on the frequency curve of a noise slope of -4.5 dB per octave.

The plugin offers four main controls:

- **RESET** – Restarts the analysis at any time if the audio content changes or if you want to reset previous calculations.
- **EQ Amount** – Lets you set how much equalization is applied, from 0% (no correction) to 100% (full calculated correction).
- **Brightness** – Adjusts how "bright" the sound should be. At 0 (the default), BalanceEQ conforms the signal to a -4.5 dB/octave slope. At higher values, it shifts toward a pink noise slope (-3 dB/oct), while at lower values it approximates brown noise (-6 dB/oct).
- **High Pass** – Displays the frequency chosen by the algorithm for the high-pass filter, and allows you to manually set it by dragging or typing a new value.

BalanceEQ's EQ engine operates across six bands:

- **Low Shelf** at 200 Hz, to manage the low-end
- Four bands with Q 0.5 at 400 Hz, 800 Hz, 1600 Hz, and 3200 Hz, covering the body and clarity of the sound
- **High Shelf** at 6400 Hz, to shape brightness and air

Thanks to this structure, BalanceEQ not only helps create coherent and balanced sounds, but it can also be an excellent tool for mixing and mastering, allowing you to correct EQ issues without altering the original character of the track.

BalanceEQ is available in VST3, Audio Unit, and AAX formats, compatible with macOS 10.13 or later and Windows 10 or later. The interface is fully scalable and supports light, dark, or automatic themes based on system settings.



## How BalanceEQ Works

As soon as BalanceEQ is loaded, it enters analysis mode and waits for an audio signal. The algorithm follows a series of steps to ensure the best possible balance:

1. **Analyzes the audio level** using integrated LUFS metering. When the level remains stable for more than three seconds, it moves to the next step.
2. **Normalizes the signal** to -24 LUFS to maintain a consistent reference.
3. **Examines the spectrum** and identifies the highest peak frequency.
4. **Adjusts the high-pass filter**, starting at 30 Hz and moving up until it reaches a frequency 15 dB below the maximum peak.
5. **Begins band analysis**, starting from the band containing the highest peak.
6. **Measures each band's** LUFS level using a band-pass filter centered on the corresponding frequency.
7. **Compares the levels** with the reference curve, which follows a -4.5 dB/octave slope and is represented by a magenta line in the UI.
8. **Ignores insignificant bands** if their levels are at least 15 LUFS lower than the peak.
9. **Adjusts the gain** for each band, applying corrections to bring the signal as close as possible to the reference response.

BalanceEQ's goal is to deliver a balanced, polished sound, ensuring your mix remains clear and well-defined without unwanted frequency buildup or dips.