SPECTRA 99 — User Guide
High-Resolution Audio Spectrum Analyzer

Version: 1.1
Website: https://hakanyurdakul.com/spectra99/
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Formats: Standalone Application (Windows 64-bit) , VST3 (Windows)
Audio Engine: 96 kHz Ready / 32-bit floating-point (Standalone), 64-bit double-precision (VST3)

SPECTRA 99 is designed for modern high-definition audio workflows and is fully optimized for sample rates up to 96 kHz, delivering precise and stable spectral analysis in both standard and high-resolution sessions. The standalone application operates at 44.1 kHz and above, while the VST3 plugin follows the host DAW's sample rate.

At its core is a **99-Band Balanced Log-Linear Musical Layout**, providing a natural and intuitive view of your mix from deep sub-bass to the highest air frequencies.

Key Features

- **Engine:** 99-Band Balanced Log-Linear Musical Layout
- **Resolution:** Adaptive 4096 / 8192-Point FFT
- **Windowing:** Ultra-Low Spectral Leakage Blackman Algorithm
- **Tilt Modes:** 0 dB, 3 dB, 4.5 dB Reference Slopes
- **Ballistics:** 100 ms, 250 ms, 500 ms Decay Modes
- **Precision:** 32-bit floating-point (Standalone), 64-bit double-precision (VST3)
- **Metering:** Dual-layer LR Peak meters (background = input, top ticks = output)
- **Stereo Tool:** Correlation meter for width & phase monitoring
- **Safety:** Output level control (Standalone), Post Gain trim control (VST3)
- **Formats:** Standalone Application & VST3 Plugin
- **Sample Rates:** 44.1–96 kHz (Standalone), Host-Dependent in VST3

Standalone Architecture

The standalone architecture enables instant loading, looping, and analysis of audio files without requiring a DAW. It's designed for fast, focused audio work—whether checking references, making precise adjustments, or performing detailed evaluations.

CPU-Efficient Processing

Each tool is engineered with highly optimized DSP and lightweight graphics, ensuring stable, low-latency performance in both standalone and VST3 formats—even under heavy analysis or high sample rates.

Playback & Analysis Tools

Loop Playback (Standalone Version)
Repeat any section of audio continuously to focus on problem areas, transitions, or short musical phrases without restarting playback.

0.5× Slow-Motion Playback (Standalone Version)
Play audio at half speed for detailed transient inspection, timing analysis, and precise low-end monitoring.

Hold Mode
Freeze the current spectrum display to inspect peaks and balances at any moment, making it easy to study complex passages or compare changes while mixing.

Post Gain — Safe Monitoring Control (Standalone Version)
Adjust the final monitoring level without affecting the audio signal, analysis, or meters. Post Gain lets you protect your ears and speakers when working with loud material, while keeping measurements fully accurate.

Trim (VST version)
The Trim control adjusts the plugin's output level after analysis**.** It affects the audio signal sent back to the DAW and therefore affects bounce/export**.**

Analyzer Response Speeds

• **100 ms — Sharp:** For Metal/Techno/DnB. Jittery, precise, high-energy; reveals fast transients.
• **250 ms — Natural:** For Rock/Pop/Jazz. Bouncy, musical; balanced everyday response.
• **500 ms — Soft:** For Ambient/Lo-Fi/Classical. Smooth, relaxed; ideal for tails and textures.

Spectral Tilt Modes

• **0 dB — Raw:** White = flat, Pink = falling; ideal for technical analysis.
• **3 dB — Standard:** Pink = flat; industry-standard mixing reference.
• **4.5 dB — Modern:** Lowers highs visually; favours brighter contemporary mixes

Musical Frequency Zoning

The spectrum is divided into **Low, Low-Mid, Mid, High-Mid, and Air** regions, enabling fast and intuitive mix analysis across the full frequency range.

Colour Themes

Choose from multiple colour themes to match your workflow, lighting conditions, and personal preference.

Adaptive Resolution Engine

SPECTRA 99 automatically scales its FFT resolution based on the current sample rate:
• 4096-point FFT at 44.1 / 48 kHz
• 8192-point FFT at 88.2 / 96 kHz

This guarantees consistent, razor-sharp low-end visualization at any resolution, ensuring deep bass accuracy without sacrificing real-time performance.

Blackman Windowing
An ultra-low spectral leakage Blackman window provides superior frequency separation and clean fundamentals, preventing spectral smearing between bands.

Credits

Development: Application architecture, processing integration, analysis engine, and user interface design by Hakan Yurdakul. DSP implementations use JUCE framework components.
Framework: Developed using the JUCE framework.
Typography: Open Sans (SIL Open Font License 1.1). Copyright © The Open Sans Project Authors.
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Installation & First Launch (Windows)

Spectra99 is a portable standalone application. No installation is required.
1. Download and unzip the file.
2. Double-click **Spectra99.exe** to launch the application.

Note: On the first launch, Windows may display a **"Windows protected your PC"** message. This occurs because the application is not yet code-signed by Microsoft.

To continue:
1. Click **More info**
2. Click **Run anyway**

The application does not install background services or modify system files.

Version History

v1.1 (January 2026)

- **Fixed:** Visual alignment of the Level Meter. Corrected a graphical issue where **both** the input bars (background) and output sticks (foreground) were not visually matching the dB scale.
- **Optimized:** Standalone UI performance. Corrected layer caching for the waveform display to reduce CPU load.

v1.0 (Initial Release)

- First public release of Spectra 99.