VIVO

User Manual

version 1.0 | RBLD Audio

Multimode synthesizer for harmonic resonance and spectro-modal resynthesis

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1. Installation

VIVO is distributed as a **VST3 plugin** with installers for Windows and macOS. The installer copies the plugin to the standard VST3 folder, installs the factory presets, and configures the preset path for first use. In a normal installation, you do not need to copy the plugin or point the preset library manually.

1.1 Windows

VIVO runs on **Windows 10 and Windows 11** (64-bit). Use the Vivo_1.0.0_Win_Installer.exe installer. Because the installer is not code-signed yet, Windows Defender SmartScreen may display a warning before installation — this is normal for independently distributed plugins.

1	Right-click Vivo_1.0.0_Win_Installer.exe and choose **Run as administrator**.
2	If Windows shows *"Windows protected your PC"*, click **More info** and then **Run anyway**. Confirm the administrator prompt.
3	Follow the installer wizard: accept the license, choose where to install presets, and click **Install**. The default preset path is C:\ProgramData\Vivo VST\Vivo Presets.
4	The installer places the plugin at C:\Program Files\Common Files\VST3\Vivo.vst3\ and writes the settings VIVO needs to find the presets automatically.
5	Open your DAW and perform a VST3 plugin rescan, or restart the DAW. VIVO will appear in the instrument list.

■ *If your DAW uses custom VST3 paths, confirm in the DAW preferences that C:\Program Files\Common Files\VST3\ is included in the scan.*

1.2 macOS — Universal Binary (M1/M2/M3 + Intel, macOS 11+)

The **Universal Binary** version contains native binaries for both **Apple Silicon** (arm64) and **Intel** (x86_64). It runs at full native speed on any Mac without requiring Rosetta. Requires **macOS 11.0 Big Sur** or newer. Use the Vivo_1.0.0_MacUniversal_Installer.pkg installer.

1	Right-click Vivo_1.0.0_MacUniversal_Installer.pkg and choose **Open**. In the warning dialog, click **Open** again.
2	If the **Open** button does not appear, go to **System Settings** → **Privacy & Security**, scroll to **Security**, and click **Open Anyway**.
3	Follow the installer: accept the license, choose where presets will be installed, and click **Install**. macOS will ask for your administrator password.
4	The installer places the plugin at /Library/Audio/Plug-Ins/VST3/Vivo.vst3 and installs the factory presets, already pointing the plugin to them.
5	Open your DAW and perform a VST3 plugin rescan. The factory presets will load automatically.

1.3 macOS — Intel Only (macOS 10.13 High Sierra and later)

The **Intel** version is compatible with **macOS 10.13 High Sierra** and later (x86_64). Use the Vivo_1.0.0_Mac10.13_Installer.pkg installer. On Apple Silicon Macs (M1/M2/M3) this version runs via **Rosetta 2**, which macOS installs automatically the first time it is needed. For native performance on Apple Silicon, prefer the Universal Binary version.

1	Right-click Vivo_1.0.0_Mac10.13_Installer.pkg and choose **Open**. In the warning dialog, click **Open** again.
2	If the **Open** button does not appear, go to **System Preferences** → **Security & Privacy** → **General** and click **Open Anyway**. You may need to unlock the padlock and type your password.
3	Follow the installer: accept the license, choose where presets will be installed, and click **Install**. macOS will ask for your administrator password.
4	The installer places the plugin at /Library/Audio/Plug-Ins/VST3/Vivo.vst3 and installs the factory presets, already pointing the plugin to them.
5	Open your DAW and perform a VST3 plugin rescan. In some DAWs, such as Reaper and Bitwig, you may need to confirm manually that /Library/Audio/Plug-Ins/VST3/ is included in the scan preferences.

1.4 If the DAW Does Not Load the Plugin on macOS

Because VIVO is independently distributed, macOS Gatekeeper may block the plugin on first load. If your DAW does not find VIVO, shows an unidentified developer error, or blocks the plugin while loading, approve it in the system security panel or remove quarantine via Terminal.

macOS 10.13 – 12	Open **System Preferences** → **Security & Privacy** → **General** and click **Allow** or **Open Anyway** for VIVO, if the message appears.
macOS 13 – 15+	Open **System Settings** → **Privacy & Security**, scroll to **Security**, and click **Open Anyway** for VIVO, if the message appears.

Remove quarantine via Terminal

If manual approval does not solve it, open **Terminal** (Applications → Utilities → Terminal) and run:

Plugin installed by the installer	sudo xattr -cr "/Library/Audio/Plug-Ins/VST3/Vivo.vst3"

The system will ask for your administrator password. Type it and press Enter — the password does not appear on screen, this is normal. Then perform a new plugin rescan in your DAW.

> ■ **Use sudo spctl --master-disable only as a temporary last resort for diagnosing Gatekeeper blocks. After confirming that the plugin loads, re-enable it with sudo spctl --master-enable.**

1.5 Activation

The first time you open VIVO on an instrument track, the activation window appears.

1	Paste the **license key** you received with your purchase.
2	Click **Activate**.
3	Activation is saved on the computer and the plugin works offline afterwards.

■ *Each license can be activated on up to 2 machines.*

1.6 Changing the Preset Folder After Installation

The installer configures the preset folder automatically. You only need to change this path if you move the **Vivo Presets** folder after installation.

1	Move the **Vivo Presets** folder to the new location.
2	Open VIVO in your DAW.
3	In the preset panel, click the folder icon or the **Choose Preset Folder** button.
4	Navigate to the **Vivo Presets** folder — the one containing the *Presets/* and *Samples/* subfolders — and select it.
5	The plugin will remember the new path automatically.

■ **Prefer selecting the root Vivo Presets folder, which contains *Presets/* and *Samples/*. The plugin can also read a directly selected *Presets/* folder, but the root folder keeps presets and legacy samples in the same context.**

1.7 Uninstalling

Windows	Control Panel → Programs → Uninstall a program → **[RBLD Audio] Vivo VST3** → **Uninstall**. During uninstall, you can choose whether to remove the preset folder as well.
macOS	Remove /Library/Audio/Plug-Ins/VST3/Vivo.vst3 and, if desired, delete the **Vivo Presets** folder from the location chosen during installation.

2. Concept and Signal Chain

VIVO is a multimode VST3 synthesiser with two main synthesis engines: one based on a **bank of harmonic Peak filters**, and the **Resynth** engine, based on spectral resynthesis with controls inspired by modal synthesis. Both engines start from the same musical idea: turning a sound source into a MIDI-playable instrument with harmonic content organised around the played note.

The first engine uses a **bank of 8 harmonic Peak filters** (biquad IIR peaking EQ). This bank can be fed by the built-in sampler, white noise, pink noise, or live audio from the DAW. Each Peak filter is tuned to resonate at a harmonic of the played MIDI note. The resonance energy extracted from these filters is summed to reconstruct the harmonic content of the note, turning samples, noise, or external signals into rich, organic, melodic timbres.

Unlike bandpass filters, which isolate a narrow band and discard much of the surrounding signal, **Peak filters** selectively amplify harmonic regions while preserving the character of the original source. The filters are independent for L and R channels, preserving the stereo image of the input material. Frequencies automatically follow the played note — harmonic keytracking is always 100%, fixed in code — and **Peak Q** adjusts the bandwidth of all 8 filters simultaneously.

The second engine is **Resynth**. Instead of using Peak EQ filters, it performs resynthesis based on spectral analysis of the loaded sample. The engine uses 8 sinusoidal oscillators, each with independent exponential decay, and modulates each partial's frequency and amplitude in real time according to the analysed material.

Although Resynth is based on spectral analysis, its interface is organised like a **modal synthesis** instrument. **Exciter** controls the initial excitation behaviour — the attack and energy that set the partials in motion. **Ring** controls the natural decay after that excitation, determining how harmonics sustain, fade, or interact over time. Exciter and Ring influence harmonic frequencies and amplitudes for each played note, always based on the sample analysis and the values set in the Resynth panel.

In both engines, the lower panel lets you adjust the volume of each harmonic individually. This gives direct control over the balance between the 8 harmonic components and greatly expands the timbral variation available for each sample, sound source, and upper-panel configuration.

Signal Chain

Source	Sample / White Noise / Pink Noise / DAW Input / Resynth
Input Gain	Pre-filter gain (-36 to +24 dB)
Harmonic Bank	8 IIR biquad Peak filters — boost extracted per harmonic and summed (Sampler, Noise, and DAW Input modes)
Resynth Engine	8 sinusoidal oscillators with spectral analysis of the sample (Resynth mode only)
Saturation	Pre-filter hard clip (limits the harmonic sum before the global filter)
Global Filter	LP / HP / BP / Notch — modulated by envelope + keytracking
Highpass 30 Hz	DC cleanup (fixed, transparent)
AMP Envelope	Amplitude ADSR

Output Gain	Final gain × velocity scaling

3. Interface Overview

Figure 1 — VIVO main window with all panels visible

The plugin's main window organises all controls into themed panels. The figure above shows the complete interface with all panels identified.

Figure 2 — Main window in Init state (default preset)

Source Panel	Selects the sound source (Sampler, White Noise, Pink Noise, DAW Input, Resynth)
Sampler Panel	Controls sample playback: Root Note, Keytrack, Velocity, Voices, Transpose, Fine Tune, Loop
Waveform / Preset	Displays the waveform with interactive handlers, active preset name, and playback head
Harmonics Panel H1-H8	Individual gain faders for each of the 8 harmonic Peak filters; amplitude and frequency meters (Resynth mode)
Amp / Resynth Panel	Amplitude ADSR envelope + Stereo, Peak Q, Peak Vol knobs / Resynth engine controls when in Resynth mode
Mod Panel	Harmonic modulators (LFO, AR Envelope, Clip) per harmonic — visible when the MOD button is active
Filter Panel	Global filter with type, cutoff, Q, dedicated envelope, and keytracking
FX Panel	Limiter, Delay, and Reverb — accessed via the FX button in the Filter panel

4. Source & Sampler Panel

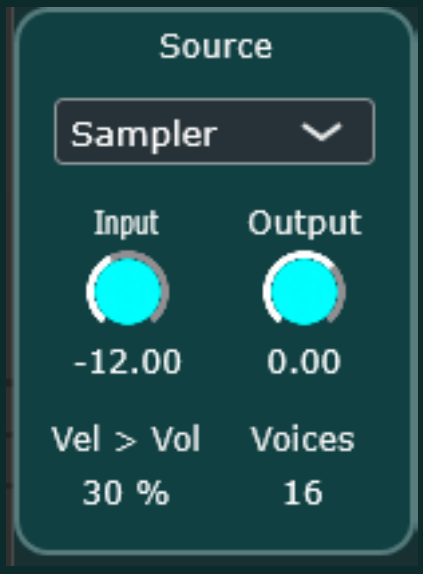

Figure 3 — Source panel with the synthesis mode selector

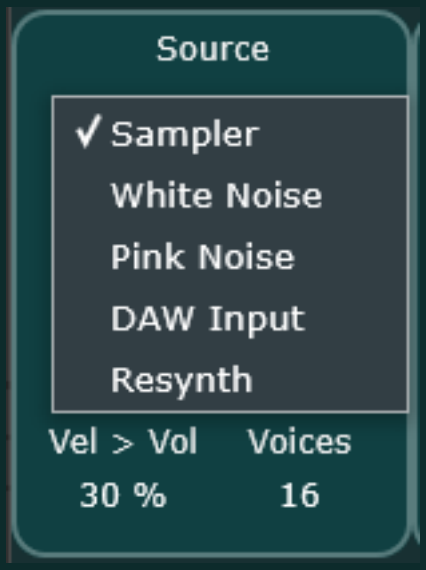

Figure 4 — Source dropdown showing all available modes

4.1 Synthesis Modes

The **Source** selector chooses the active sound source or synthesis engine. Sampler, White Noise, Pink Noise, and DAW Input feed the harmonic Peak filter bank; Resynth replaces that engine with sinusoidal oscillators guided by spectral analysis of the sample.

Sampler	Plays back the loaded sample (WAV, AIF/AIFF, FLAC, or OGG). Pitch can follow the keyboard via **Keytrack**. The most versatile mode — any recording becomes a harmonic timbre.
White Noise	White noise as source. Useful for percussive textures and dense pads with no defined harmonic content in the source.

Pink Noise	Pink noise (more balanced energy per octave, -3 dB/octave). Warmer and more natural sounds than white — preferred for pads and soft textures.
DAW Input	Uses the audio signal entering the plugin in real time. Allows processing any DAW signal through the harmonic bank. Velocity is ignored (always 1.0).
Resynth	Modal synthesis engine: 8 sinusoidal oscillators with independent exponential decay and spectral analysis of the sample. The sample acts as an exciter and as a spectral profile to modulate oscillator frequencies. Does not use IIR filters — harmonics generated directly, with coherent phase between partials. The Resynth panel replaces the Amp panel when this mode is active.

4.2 Sampler Panel

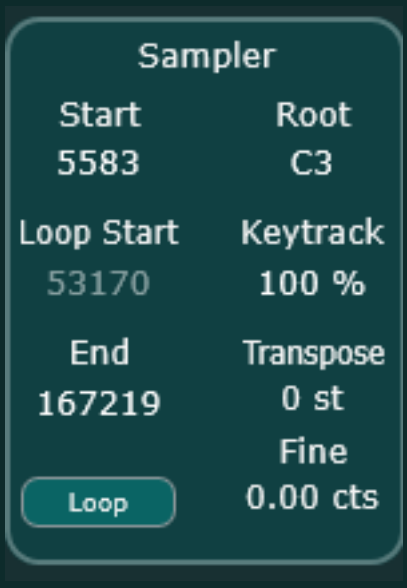

Figure 5 — Sampler Panel with Loop disabled

Figure 6 — Sampler Panel with Loop enabled (Loop Start and Loop End controls active)

The controls below are available in the Sampler panel. In Sampler mode, Root Note and Keytrack define how the sample is transposed by the keyboard. In White Noise, Pink Noise, and DAW Input modes, Root

Note and Keytrack do not apply, because there is no tuned sample to transpose. In Resynth mode, Root Note and XKeytrk act as references for reading the sample's spectral profile; oscillator pitch follows the played MIDI note, plus Transpose and Fine Tune.

Parameter	Range	Default	Description
Root Note	0 – 127 (C-2 to G8)	60 (C3)	Sample root note. Defines the reference for pitch keytracking in Sampler mode. Drag slowly on the display = 1 semitone per step. In Resynth mode, it serves as the reference for scaling the sample's spectral profile.
Keytrack	0 – 100%	0%	Sample pitch tracking intensity. 0% = fixed pitch; 100% = sample transposed proportionally to played note. In Resynth mode, displayed as **XKeytrk** — controls how much the sample spectral profile is scaled by the MIDI note; it does not change the oscillators' base pitch.
Velocity	0 – 100%	100%	MIDI velocity sensitivity applied to the final volume.
Voices	1 – 32	16	Maximum number of simultaneous voices (polyphony).
Transpose	-36 to +36 st	0	Global transpose in semitones. Affects sample playback, harmonic filter frequencies, and, in Resynth mode, modal oscillator pitch.
Fine Tune	-100 to +100 cents	0	Fine tuning in cents. Tunes sample playback and, in Resynth mode, also tunes the modal oscillators. In the Peak filter engine, it does not retune the harmonic filters.

4.3 Loop

The loop is configured by controls in the Sampler panel. Start and end points can be dragged directly on the waveform, with real-time effect even during note playback. When Loop is disabled, the Loop Start and Loop End controls are greyed out.

Parameter	Range	Default	Description
Loop On/Off	Toggle	Off	Enables/disables loop mode for the sample. When active, enables the Loop Start and Loop End controls.
Sample Start	0.0 – 0.99	0.0	Playback start point in the sample. Drag the triangular handler on the waveform.
Loop Start	0.0 – 0.99	0.0	Loop start point. Visible on the waveform when Loop is active.

Parameter	Range	Default	Description
Loop End	0.0 – 1.0	1.0	Loop end point. The playhead jumps back to Loop Start when it reaches here.
Sample End	0.0 – 1.0	1.0	Playback end point. Drag the handler on the waveform.

■ *A loop with a percussive transient at the start and sustain in the middle/end creates naturally breathing pads. Hold Shift while dragging a handler for fine-resolution editing. Use the mouse wheel, or the equivalent trackpad gesture, over the waveform to zoom in/out.*

5. Waveform & Preset

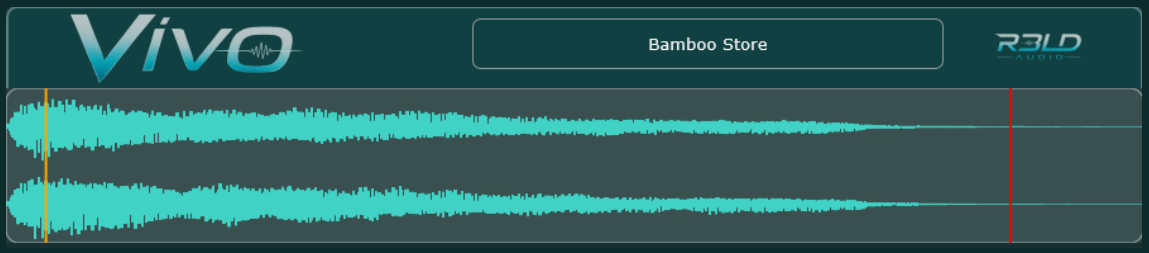

Figure 7 — Waveform panel with Loop disabled: Start and Sample End handlers visible

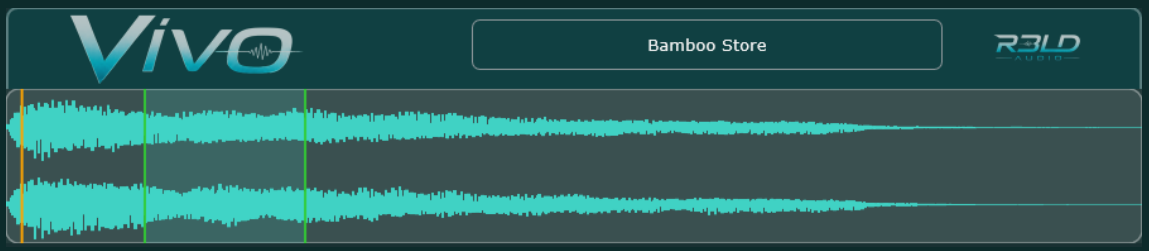

Figure 8 — Waveform panel with Loop enabled: Start, Loop Start, Loop End, and Sample End handlers visible

The central area displays the **waveform** of the loaded sample. Beyond being visual, it is fully interactive — all playback points are edited by dragging handlers over the waveform, and the plugin shows the playback head in real time while a note is held.

5.1 Waveform Handlers

Triangular handlers sit at the bottom of the waveform area. Each corresponds to a playback parameter and can be dragged horizontally with the mouse. Changes take effect immediately, even with notes playing. When Loop is disabled, only the **Start** and **Sample End** handlers are visible/active.

Start	Sets the **start point** — where playback begins when a note is triggered. Drag right to skip the beginning of the sample.
Loop Start	Marks the beginning of the loop region. Active only when Loop is on. Drag to adjust where the loop restarts.
Loop End	Marks the end of the loop region. The playhead jumps to Loop Start when it reaches here. Drag to shorten or extend the loop.
Sample End	Sets the **end point** — playback stops here (or loops). Drag left to trim the end of the sample.

■ *Hold Shift while dragging a handler for fine-resolution editing. Scroll the mouse wheel over the waveform to zoom in/out. Right-click a handler to reset to its default value.*

5.2 Loading Samples

Drag and drop	Drag any audio file (WAV, AIF, AIFF, FLAC, or OGG) directly onto the plugin window to load it as a sample. The waveform updates immediately.
Preset indicator	Just below the waveform is the active preset name. Click the **Presets** button to open the manager.

Playback head	A thin vertical line shows the current read position in real time while a note is held.

■ *Sample loading is active in Sampler and Resynth modes. In White Noise, Pink Noise, and DAW Input modes, the waveform remains visible, but the sound source does not depend on a newly loaded sample.*

6. Harmonics Panel (H1-H8)

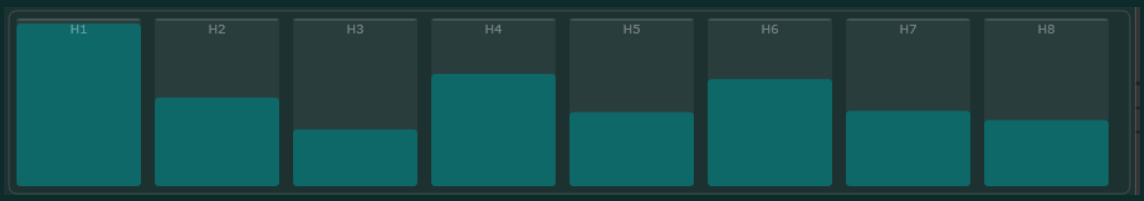

Figure 9 — Harmonics panel in Sampler mode: 8 H1-H8 gain faders

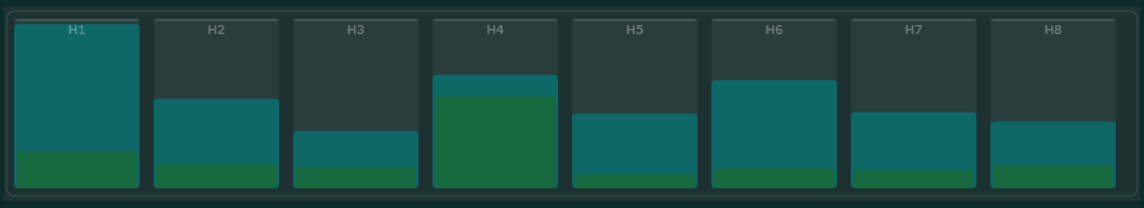

Figure 10 — Harmonics panel in Sampler mode: amplitude meters per harmonic

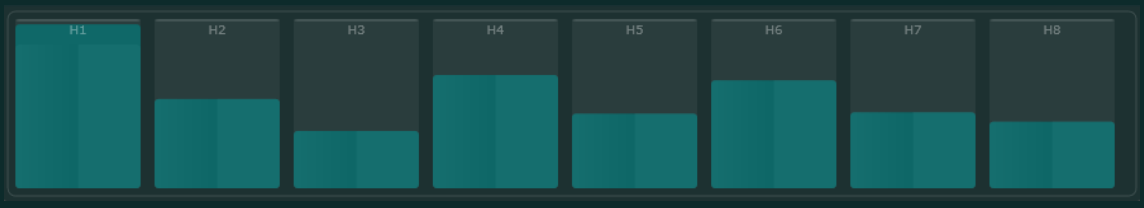

Figure 11 — Harmonics panel in Resynth mode: gain faders with active frequency meters

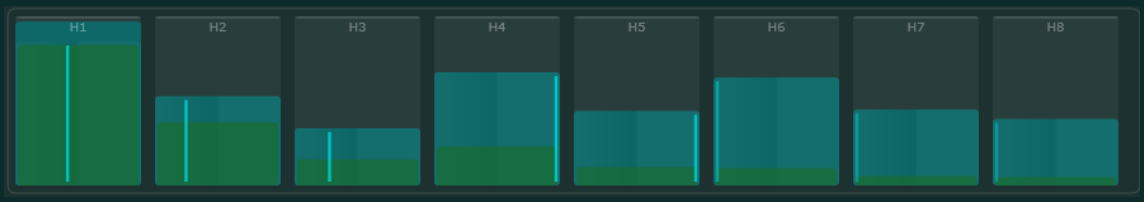

Figure 12 — Harmonics panel in Resynth mode: amplitude and frequency meters per partial

Figure 13 — Detail of harmonic H1 in Resynth mode: level meter and frequency meter

The heart of VIVO is the bank of **8 harmonic Peak filters** (biquad IIR peaking EQ). Each filter is tuned to a harmonic multiple of the played MIDI note: H1 is the fundamental (1×), H2 is the first overtone (2×), H3 is the fifth (3×), and so on up to H8 (8×). The combination of gains defines the instrument's timbre.

The Peak filter amplifies energy precisely at each harmonic frequency. Only the resonance boost is extracted from each filter (the dry signal is subtracted internally), and the 8 boosts are summed to build

the final harmonic content. This gives VIVO its distinctive, resonant, organic quality.

In **Resynth** mode, the H1-H8 faders control the **gain of each sinusoidal oscillator**, not filters. The frequency meters (thin vertical bars above each fader) show in real time how much each partial has deviated from the ideal harmonic frequency — very useful for monitoring the effect of the XFollow and XTime controls.

6.1 Harmonic Gains (H1-H8)

Each fader controls the gain of the corresponding harmonic. The value is displayed on a 0-127 scale (MIDI style). With only H1 active the result is near-sinusoidal synthesis. Adding even harmonics creates flute-like sounds; odd harmonics generate richer, more instrumental timbres.

Parameter	Range	Default	Description
H1 – H8 Gain	0 – 127	0	Individual gain of each harmonic (0-127 scale). Combined with Peak Q, they define the tonal colour of the instrument. In Resynth mode, they control the amplitude of each sinusoidal oscillator.

Above each fader, a meter bar displays the instantaneous amplitude of the harmonic being produced. In Resynth mode, a second thinner bar (frequency meter) indicates each partial's frequency deviation relative to the ideal harmonic.

6.2 Peak Q and Peak Vol

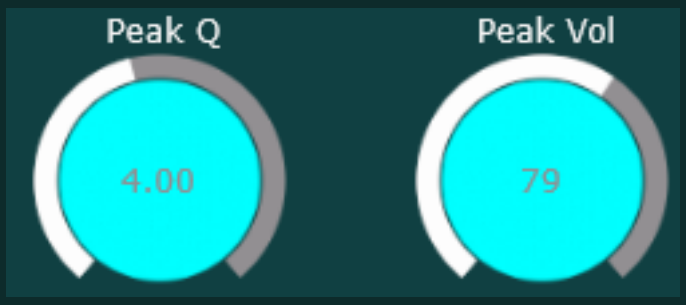

Figure 14 — Detail of Peak Q and Peak Vol knobs in the Amp panel

Peak Q controls the bandwidth of all 8 Peak filters simultaneously. Low values (1–3) produce wide filters — fuller sound with less defined resonance. High values (10–30) produce very narrow filters — more resonant and sustained timbres, close to modal synthesis. Peak Q has no effect in Resynth mode, where sinusoidal oscillators have zero bandwidth.

Peak Vol is the global gain of the harmonic Peak filter bank — a master fader that scales all H1-H8 proportionally in Sampler, Noise, and DAW Input modes. Useful for calibrating the level without changing the balance between harmonics. The range is 0 to +45 dB. In Resynth mode, the Resynth panel replaces the Amp panel, and partial levels are controlled by the H1-H8 faders and Output Gain.

Parameter	Range	Default	Description
Peak Q	1 – 30	4.0	Bandwidth of all Peak filters simultaneously. Skew with centre at Q=5. Does not affect Resynth mode.

Parameter	Range	Default	Description
Peak Vol	0 – 45 dB	0 dB	Global gain of the Peak filter bank. Scales all H1-H8 proportionally in non-Resynth modes.

■ *To simulate an oboe: emphasise H1, H2, H3, H5. For a clarinet: odd harmonics (H1, H3, H5, H7) with H2, H4, H6, H8 low. Increase Peak Q for a more focused and resonant character in both cases.*

7. Amp Panel & Amplitude Envelope

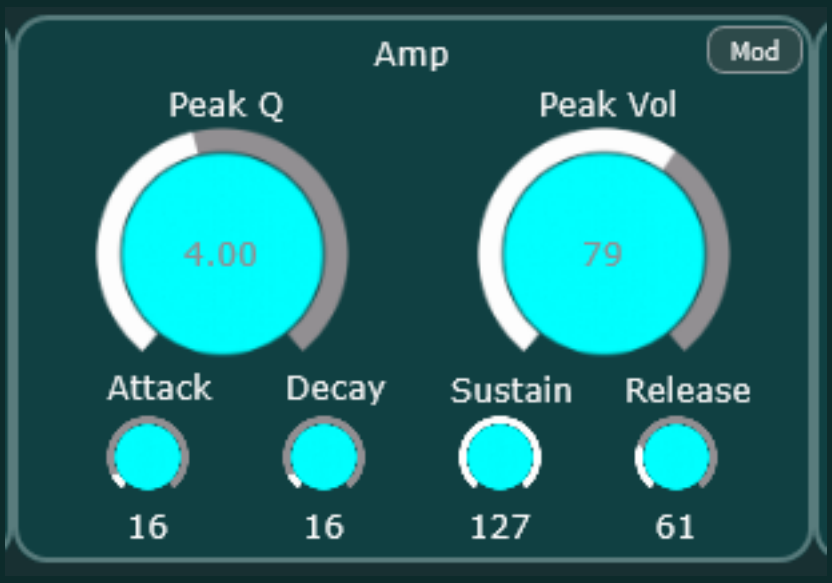

Figure 15 — Complete Amp panel with envelope controls, stereo, Peak Q, and Peak Vol

Figure 16 — Central panel with MOD button disabled (standard Amp view)

Figure 17 — Central panel with MOD button enabled (expanded Mod view)

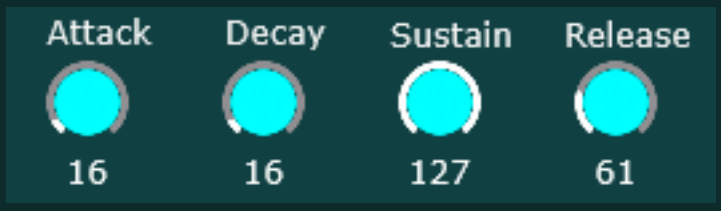

Figure 18 — Detail of the Amplitude Envelope controls (ADSR)

The **Amp** panel controls the amplitude envelope (ADSR), stereo widening, and — in the expanded mode with the **MOD** button — the individual harmonic modulators (see section 8). When Resynth mode is active, the Amp panel is replaced by the Resynth panel.

Parameter	Range	Default	Description
Attack	0.001 – 10 s	0.01 s	Amplitude envelope rise time after a MIDI note-on. Exponential convex curve (CEM 3310 style).
Decay	0.001 – 10 s	0.1 s	Exponential fall time from the attack peak down to the Sustain level.
Sustain	0.0 – 1.0	0.8	Sustained level while the key is held.
Release	0.001 – 10 s	0.2 s	Exponential fall time after the key is released (note-off).

Parameter	Range	Default	Description
Stereo	0 – 3%	0%	Slightly detunes the L and R channels to create a stereo image. In Peak filter modes, it separates filter frequencies per channel; in Resynth, it separates L/R oscillators. Small values (0.5–1.5%) are already noticeable.
MOD (button)	Toggle	Off	Expands the panel showing the individual harmonic modulators (LFO/Env/Clip per H1-H8). See section 8.

The amplitude envelope mimics the electrical behaviour of the **CEM 3310** chip (Curtis Electromusic Specialties), used in classic analogue synthesisers such as the Sequential Prophet-5 and the Oberheim OB-Xa. In this circuit, a capacitor charges and discharges through resistors — producing exponential curves at all stages:

Attack: the capacitor charges towards a voltage above the peak (2× overshoot target). The resulting curve is convex — starts very fast and gradually decelerates as it approaches the peak. This produces the characteristic initial "snap" of analogue synths, particularly audible on short attacks.

Decay and Release: the capacitor discharges exponentially, generating the classic concave curve — falls quickly at first and becomes progressively slower, creating the natural "tail" that makes analogue synth sounds feel organic.

Sustain: no curve — it is a constant level. The envelope simply settles at the configured value while the key is held.

> ■ *For slow pads with a gradual entry, use Attack from 0.5s to 3s. For percussive sounds like mallet or pluck, use a very short Attack (1-5 ms) and Decay from 0.1s to 0.5s with low Sustain (0 to 0.2).*

8. Mod Panel — Harmonic Modulators

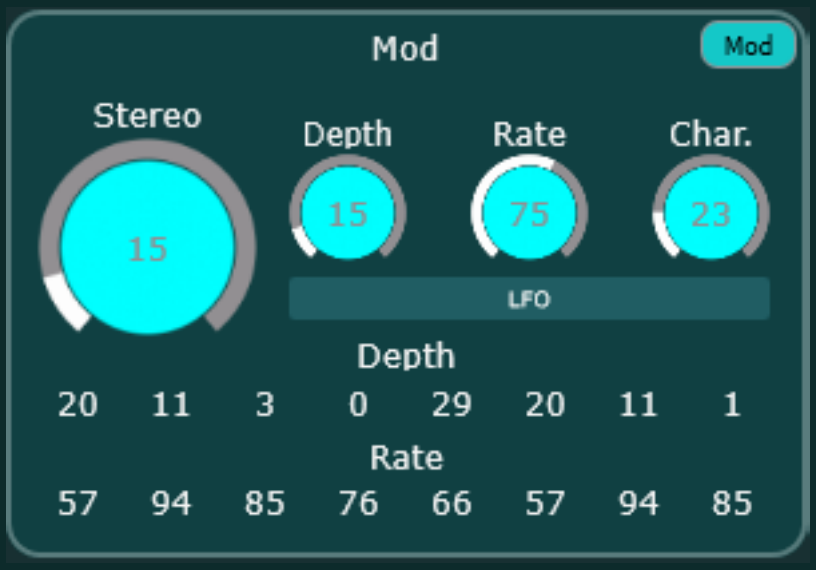

Figure 19 — Mod panel in LFO mode with Character active (Global view)

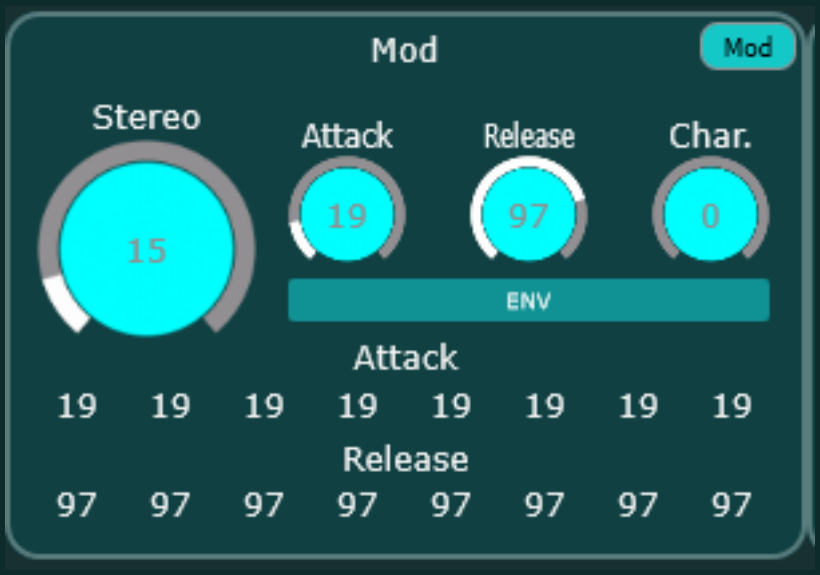

Figure 20 — Mod panel in ENV mode with Character disabled (Global view)

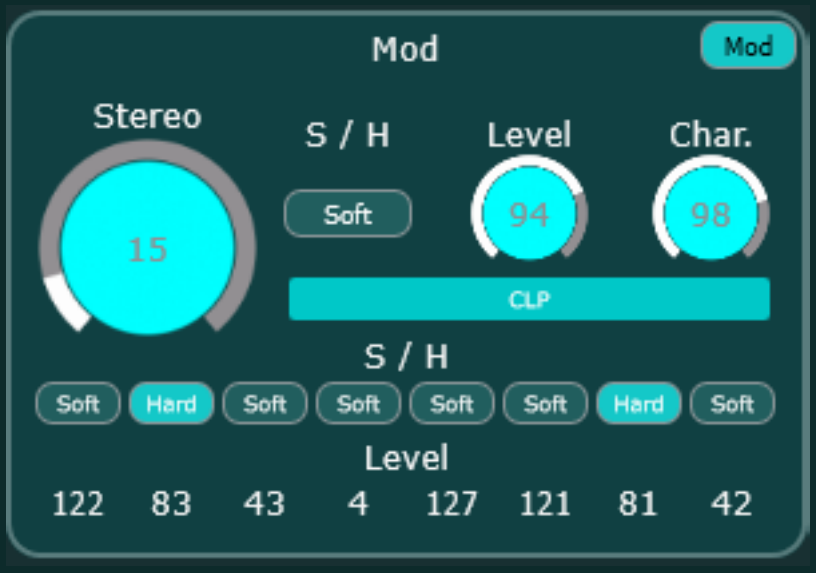

Figure 21 — Mod panel in CLIP mode with Character active (Global view)

Clicking the **MOD** button in the Amp panel expands the central area to reveal the harmonic modulators. The Mod panel has two sub-views: **GLOBAL** (default) and **FINE**.

8.1 GLOBAL Sub-view

Figure 22 — Detail of the Character knob and mode selector in the Mod Global panel

The **GLOBAL** sub-view allows applying the same mode and parameters to all 8 harmonics at once. The **GLOBAL / FINE** button toggles between the two views.

Mode Selector	Click the coloured chip (LFO / ENV / CLP) to cycle through the 3 modes. Colour indicates mode: dark teal = LFO, mid teal = ENV, bright teal = CLIP.
Param 1 / Param 2	The two knobs change function depending on mode: LFO = Depth/Rate; ENV = Attack/Release; CLIP = S/H / Level.
Character	Knob from 0 to 1 that distributes global parameters across the 8 harmonics with a deterministic variation per harmonic. 0 = all identical; 1 = maximum variation. The variation is always the same for the same values, guaranteeing predictable, preset-saveable behaviour.

8.2 FINE Sub-view

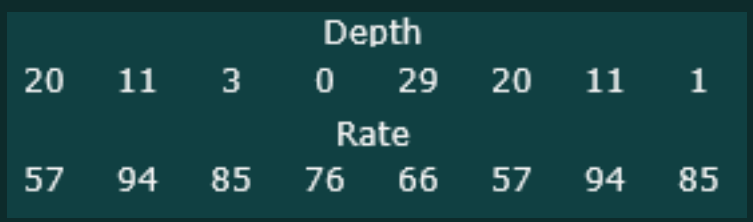

Figure 23 — Detail of LFO values for all 8 harmonics in the FINE view

The **FINE** sub-view displays 8 columns — one for each harmonic H1-H8 — allowing individual adjustment of each modulator. Each column shows a mode selector and two parameter values (editable by vertical drag).

■ *Use the GLOBAL view with Character at 0 to start from a uniform base, then switch to FINE to adjust specific harmonics. Changes made in GLOBAL overwrite the individual FINE values.*

8.3 LFO Mode

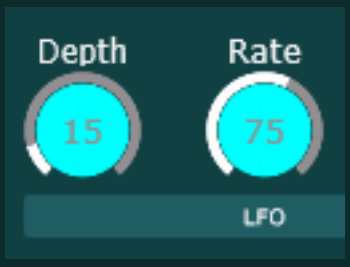

Figure 24 — LFO mode controls: Depth and Rate

Modulates the harmonic gain with a sinusoidal low-frequency oscillator. The LFO is free-running (not BPM-synced) and has an independent phase per harmonic.

Parameter	Range	Default	Description
Depth (DPT)	0.0 – 1.0	0.0	Modulation depth. 0 = no effect; 1.0 = full tremolo on this harmonic. Displayed as 0-127.
Rate (RATE)	0.05 – 20 Hz	~2 Hz	LFO speed. Logarithmic scale (normalised 0-1 value mapped to frequency in Hz). Displayed as 0-127.

■ *LFOs with different rates on H1-H8 (using Character in GLOBAL) create harmonic chorus effects and complex tonal movement without any external processing.*

8.4 ENV Mode (AR Envelope)

Figure 25 — ENV mode controls: Attack and Release per harmonic

Each harmonic gets its own Attack/Release envelope, subordinate to the note trigger of the main AMP envelope. Allows harmonics to fade in and out at different speeds, creating tonal evolution over the course of the note.

Parameter	Range	Default	Description
Attack (ATK)	0.0 – 1.0	0.0	Rise time of the individual harmonic envelope. 0 = instantaneous; 1.0 = slow. Displayed as 0-127.
Release (REL)	0.0 – 1.0	1.0	Fall time when the note is released. 0 = instantaneous; 1.0 = long. Displayed as 0-127.

■ *Set high Attack on H1 (fundamental) and low Attack on H5-H8 to create a sound that starts with strong high-frequency presence and gradually becomes fuller — the inverse of most instruments' natural behaviour, very useful for pads.*

8.5 CLIP Mode (Waveshaping)

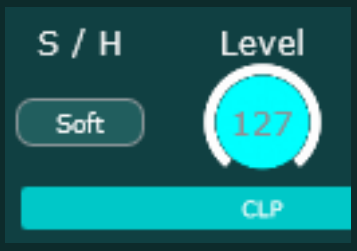

Figure 26 — CLIP mode controls: S/H (type) and Level per harmonic

Applies waveshaping (clipping) to each harmonic's signal individually, with automatic gain compensation to maintain the average level. In Resynth mode, the harmonic ENV modulator is disabled; the selector alternates between LFO and CLIP.

Parameter	Range	Default	Description
S/H (type)	Toggle Soft/Hard	Soft	**Soft (S)** = smooth curve (tanh-like), adds even harmonics, warmer character. **Hard (H)** = abrupt cutoff, odd harmonics dominate, more aggressive character.
Level (LVL)	0.0 – 1.0	1.0	Clip threshold (fraction of the harmonic's peak). Lower values = more saturation. Displayed as 0-127.

■ *Apply Hard Clip on H2 and H3 with a low Level to selectively add aggression without saturating the fundamental. In Resynth mode, LFO and CLIP remain available; use LFO for per-partial amplitude movement and CLIP to add harmonic richness to pure oscillators.*

8.6 STEREO Button (Stereo Spread)

Figure 27 — Stereo knob in the Mod panel

The **STEREO** knob (also shown as **Stereo Spread**) slightly detunes the L channel relative to the R channel, creating a natural stereo image from mono sources. In Sampler, Noise, and DAW Input modes, the spread is applied to Peak filter frequencies; in Resynth, it is applied to the sinusoidal oscillator frequencies. Range 0 to 3%. Small values (0.3–1.5%) already produce noticeable widening without losing centre coherence.

9. Filter Panel

Figure 28 — Complete Filter panel with type selector, envelope, and keytracking

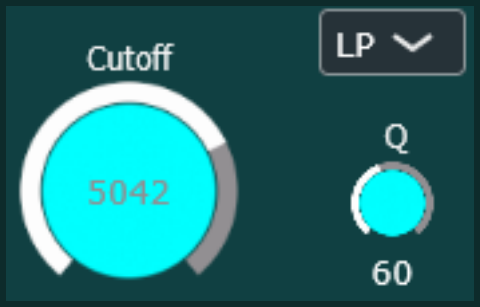

Figure 29 — Detail: mode selector, Cutoff, and Q of the filter

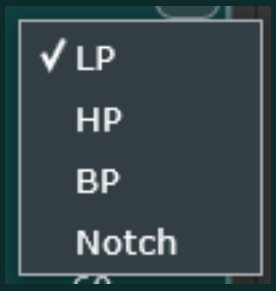

Figure 30 — The four available filter modes: LP, HP, BP, and Notch

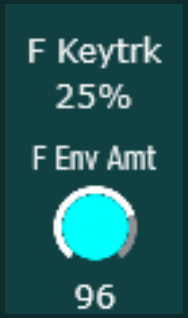

Figure 31 — Detail of Keytrack and Env Amount filter controls

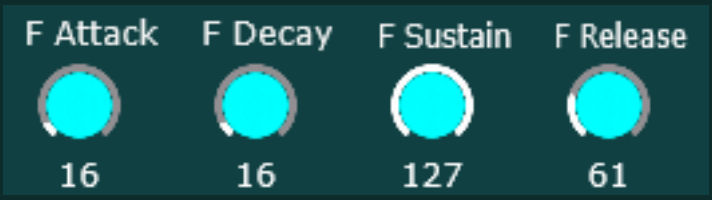

Figure 32 — Detail of the Filter Envelope controls (F-Atk, F-Dcy, F-Sus, F-Rel)

The global filter is applied *after* the harmonic bank and saturation, shaping the spectrum of the resulting sound. Implemented as a **State Variable TPT Filter** (JUCE DSP) for LP, HP, and BP — guaranteeing stability even at high resonance. The Notch uses IIR coefficients recalculated per sample. The default filter in the Init preset has Q=0.1 (effectively bypassed) and Cutoff=20 kHz (fully open).

9.1 Filter Types and Main Parameters

Parameter	Range	Default	Description
Filter Type	LP/HP/BP/Notch	LP	Selects filter mode. LP = low-pass; HP = high-pass; BP = band-pass; Notch = band-reject.
Filter Cutoff	20 – 20000 Hz	20000 Hz	Cut/centre frequency. Modulated by envelope and keytracking. Logarithmic scale with centre at 1 kHz.
Filter Q	0.1 – 20	0.1	Resonance. Q=0.1 is virtually transparent. Values above 1 add a peak at the cutoff frequency. Skew with centre at Q=2.
Filter Keytrack	0 – 100%	0%	How much the cutoff follows the played note. 100% = cutoff doubles per octave above the Root Note (C3 by default).
Env Amount	-2.0 – +2.0	0.0	Depth and direction of envelope modulation on the cutoff. Negative = filter closes on note-on (inverted envelope).

9.2 Filter Envelope (ADSR)

The filter envelope modulates the **Cutoff** proportional to the **Env Amount**. It is fully independent of the amplitude envelope — allowing, for example, a filter that opens quickly and closes slowly while the volume sustains long. Like the AMP envelope, it follows the CEM 3310 analogue behaviour: convex exponential attack (fast at start, decelerates at peak) and concave exponential decay/release (natural tail).

Parameter	Range	Default	Description
F Attack	0.001 – 10 s	0.005 s	Filter envelope rise time after note-on.
F Decay	0.001 – 10 s	0.05 s	Fall time to filter sustain.
F Sustain	0.0 – 1.0	0.6	Filter envelope sustain level (fraction of Env Amount).
F Release	0.001 – 10 s	0.1 s	Fall time when the note is released.

■ *With a positive Env Amount and short F Attack (5 ms), the filter creates a bright initial click even on slow pads — imitating the transient of wind instruments. With negative Env Amount and high Cutoff, the filter gradually closes creating a sound that "sinks" into the bass.*

9.3 Switching to the FX Panel

Figure 33 — Filter panel with FX button disabled

Figure 34 — FX button enabled: the Filter panel is replaced by the FX panel

The **FX** button in the top-right corner of the Filter panel toggles between the Filter panel and the FX panel. Only one is visible at a time. The button state is visual — both panels process the signal continuously regardless of which is visible.

10. FX Panel

Figure 35 — Complete FX panel with Limiter, Delay, and Reverb

The FX panel organises effect processors into three horizontal rows: **Limiter** (top), **Delay** (middle), and **Reverb** (bottom). Each row has an enable/disable button on the left side. In audio, effects are processed in series as **Delay** → **Reverb** → **Limiter**, keeping the limiter at the end of the chain to catch peaks after time-based effects.

10.1 Limiter

Figure 36 — Limiter controls: Enable and Maximize

Brickwall limiter with 5 ms lookahead and gain maximiser. Stereo-linked peak detection, instantaneous attack, exponential release (~80 ms), and a ceiling around -0.3 dBFS. The limiter prevents final output clipping without audible distortion — the lookahead allows cutting peaks before they occur. After it, a safety soft clip prevents residual peaks from exceeding 0 dBFS.

Parameter	Range	Default	Description
Limiter Enable	Toggle	Off	Enables/disables the limiter. The plugin reports a fixed 5 ms latency to the host because of the limiter lookahead, ensuring delay compensation when the limiter is used.
Maximize	0 – 18 dB	0 dB	Maximiser gain in dB. Amplifies the signal before the limit so that the output reaches close to 0 dBFS.

10.2 Delay

Figure 37 — Delay controls: Enable, Time, Feedback, Mix, Sync, and PingPong

Tape-style stereo delay with a floating read pointer for smooth time changes (no clicks). Supports BPM synchronisation via 17 rhythmic divisions. The feedback path includes a low-pass (~8 kHz) and high-pass (~200 Hz) for warmth and clarity in echoes — each repetition becomes slightly darker and without bass build-up.

Parameter	Range	Default	Description
Delay Enable	Toggle	Off	Enables/disables the delay.
Time	10 – 2000 ms	250 ms	Echo time in milliseconds. When Sync is active, replaced by the rhythmic division selector. Time changes are smoothed (~60 ms) to avoid clicks.
Feedback (Fbk)	0 – 95%	30%	Feedback: percentage of signal returning to the delay, creating multiple echoes. Limited to 95% to prevent self-oscillation.
Mix	0 – 100%	30%	Balance between dry signal and delay.
Sync	Toggle	Off	When active, Time is defined in rhythmic divisions synchronised to the host BPM. Available divisions: 1/32, 1/16T, 1/16, 1/16., 1/8T, 1/8, 1/8., 1/4T, 1/4, 1/4., 1/2T, 1/2, 1/2., 1T, 1/1, 1/1., 2/1 (17 divisions). Default = 1/4.
PingPong	Toggle	Off	Enables ping-pong mode — echoes alternate between L and R creating immediate stereo movement.

■ *Synced delay at 1/8 with 40% Feedback and 25% Mix adds rhythm without cluttering the mix. PingPong active on short plucks creates an instant sense of space. The "tape" character of the feedback (internal LP + HP) makes echoes sound naturally warmer with each repetition.*

10.3 Reverb

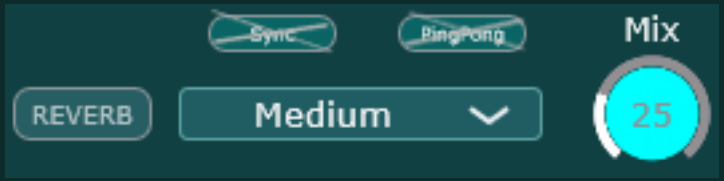

Figure 38 — Reverb controls: Enable, IR type, and Mix

Convolution reverb with **Impulse Responses** (IR) embedded in the plugin — no external file dependency. The three IRs are captures of an **EMT-140 plate reverb**, the classic studio plate reverb, in three distinct characters: Bright, Medium, and Dark. Partitioned convolution (JUCE non-uniform partitioning) with 2048 samples (~43 ms @ 48 kHz) latency on the wet path — the dry signal is not affected.

Parameter	Range	Default	Description
Reverb Enable	Toggle	Off	Enables/disables the reverb.
IR Preset	Bright / Medium / Dark	Medium	Selects the plate IR character: Bright (bright plate, strong high-frequency presence), Medium (balanced plate, classic character), Dark (dark plate, bass and mids dominate, enveloping tail).
Mix	0 – 100%	25%	Reverb wet/dry balance.

11. Resynth Panel

Figure 39 — Complete Resynth panel (visible when Source = Resynth)

The **Resynth** panel is shown in place of the Amp panel when **Resynth** mode is selected in the Source. In it, harmonics are generated by **8 independent sinusoidal oscillators** with their own exponential decay and frequency control via spectral analysis of the sample — as in a percussion or string instrument. The sample (if loaded) acts as an *exciter* and as a *spectral profile* to guide the oscillator frequencies.

Because oscillators have coherent phase with each other (zero phase at note-on), Resynth mode sounds more defined with more precise attacks than Sampler mode with Peak filters, whose phases align in an uncontrolled way.

11.1 Ring (Decay)

Figure 40 — Detail of the Ring control and P/F mode button

The **Ring** control defines the amplitude life of the oscillators' decay phase. The range goes from -10 to +10: negative values shorten the tail, positive values extend the sustain. Internally, the current mapping creates three reference points: -10 ≈ 0.12 s, 0 ≈ 7.5 s, and +10 ≈ 15 s. The decay is a true exponential, with a linear drop in dB down to roughly -60 dB at the end of the Ring time.

This decay time is separate from the spectral profile read speed. During the ring phase, the sample profile can still advance faster or slower depending on the Ring value, but the audible tail duration is controlled by the amplitude mapping described above.

Parameter	Range	Default	Description
Ring	-10 to +10	0	Modal oscillator decay time. -10 ≈ 0.12 s, 0 ≈ 7.5 s, +10 ≈ 15 s. True exponential decay, linear in dB.
Ring Mode (P/F)	Toggle P/F	P (Profile)	**P (Profile)**: during the ring phase, oscillator frequencies continue following the sample's spectral profile. **F (Free)**: after the exciter, the profile stops guiding the frequencies and the oscillators smoothly return to the harmonic centre defined by the played note.

11.2 Exciter

Figure 41 — Detail of the Exciter control and P/S mode button

The **Exciter** defines how long the sample excites the modal oscillators after note-on. It works as a duration "gate": during the Exciter time, the sample feeds the oscillators; after the gate closes, the oscillators enter the ring phase (free decay).

Parameter	Range	Default	Description
Exciter	0 – 500 ms	50 ms	Excitation gate duration. 0 ms = oscillators go directly to ring; 500 ms = long excitation, the sample guides oscillators for longer before decay begins.
Exciter Mode (P/S)	Toggle P/S	P (Profile)	**P (Profile)**: during excitation, the sample reads and applies the spectral profile (partial frequencies and amplitudes) to guide oscillators. **S (Seed)**: during excitation, uses only the instantaneous sample amplitude as a flat seed (no spectral analysis) — more abrupt transition to ring.

11.3 Resynth Envelope (AR)

Figure 42 — Resynth panel envelope controls: Attack and Release of the oscillators

The Resynth panel has its own Attack and Release controls, independent of the main AMP envelope. These control how fast the oscillators reach maximum amplitude (Attack) and how fast they fade after note-off (Release). The behaviour follows the same CEM 3310 analogue model: the Attack is convex exponential — oscillators rise fast at onset and decelerate as they reach maximum amplitude — and the Release is concave exponential, with a progressively slower tail.

Parameter	Range	Default	Description
Attack	0.001 – 2 s	0.005 s	Rise time of the Resynth oscillator envelope. Defines how fast they reach maximum amplitude after note-on.
Release	0.01 – 10 s	2.0 s	Fall time after note-off. Controls how fast oscillators fade when the note is released — independent of Ring time.

11.4 Inharmonicity

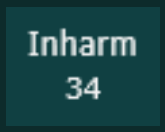

Figure 43 — Detail of the Inharmonicity control

The **Inharmonicity** control stretches the upper harmonics away from perfect integer ratios (2×, 3×, 4×...). It imitates piano inharmonicity (caused by string stiffness) or bell sounds (metal with non-harmonic partials). Low values = sounds close to wind or string instruments; high values = bell, cymbal, or metallic percussion sounds.

Parameter	Range	Default	Description
Inharmonicity	0.0 – 1.0	0.0	Stretches upper partials beyond exact harmonic ratios. 0 = pure harmonics; 1 = maximum inharmonicity (piano/bell style).

11.5 XFollow and XTime

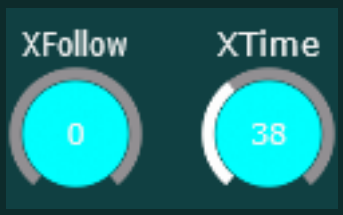

Figure 44 — Detail of the XFollow and XTime controls

XFollow and **XTime** control how the oscillators track the sample's spectral profile in real time. With XFollow = 0, oscillators follow predefined harmonic frequencies (exact multiples of the played note). With XFollow > 0, oscillator frequencies are "pulled" towards the spectral peaks detected in the sample.

Parameter	Range	Default	Description
XFollow	0.0 – 1.0	0.0	How much oscillators follow the sample's spectral peaks. 0 = predefined harmonic frequencies; 1 = frequencies completely guided by the sample spectrum.
XTime	0.001 – 2 s	0.01 s	Speed at which oscillator frequencies adjust towards the spectral target. Low values = fast tracking; high values = smooth glide.

■ *XFollow > 0 with a violin sample creates a sound that keeps the partials slightly "offset" from ideal frequencies — very organic character. High XTime smooths this tracking, creating an internal frequency glide between partials.*

11.6 XTilt (Brightness) and Damping

Figure 45 — Detail of the XTilt (Brightness) and Damping controls

XTilt (displayed as "Bright" in the interface) controls the spectral balance between lower and upper harmonics read from the spectral profile. **Damping** applies differential dampening — upper harmonics decay faster than the fundamental, imitating the acoustic behaviour of real materials.

Parameter	Range	Default	Description
XTilt / Bright	0.0 – 1.0	1.0	Spectral tilt of amplitudes read from the sample profile. 1.0 = flat (all harmonics with equal amplitude per the profile); 0.0 = intense rolloff on upper harmonics. Affects profile reading only, not the H1-H8 faders.
Damping	0.0 – 2.0	1.0	Differential dampening by frequency. The higher the value, the faster upper harmonics decay relative to the fundamental. Imitates acoustic materials like wood, felt, or metal.

11.7 Vel to Ring

Vel to Ring controls how much MIDI velocity scales the ring (decay) time. With value 0, all notes decay over the same time set by the Ring knob. With a high value, softly played notes decay faster, while hard notes sustain longer — imitating the behaviour of acoustic percussive instruments.

Parameter	Range	Default	Description
Vel to Ring	0.0 – 1.0	0.0	Velocity sensitivity on decay time (Ring). 0 = velocity does not affect Ring; 1.0 = soft notes decay much faster than loud notes.

■ *To simulate a bell: high Ring (+5 to +8), short Attack (5-10 ms), medium Damping (0.5-1.0), Inharmonicity between 0.2 and 0.5, and Vel to Ring at 0.5-0.7. For a synthetic kick: low Ring (-5 to -8), Exciter at 30-80 ms, high Damping (1.5-2.0).*

11.8 Root Note and XKeytrack in Resynth Mode

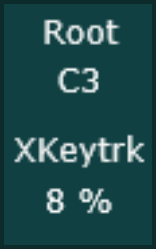

Figure 46 — Detail of Root Note and XKeytrack in the Sampler panel when in Resynth mode

In Resynth mode, the **Keytrack** control in the Sampler panel is displayed as **XKeytrk**. It does not define the oscillators' main pitch — the oscillators always follow the played MIDI note, plus Transpose and Fine Tune. XKeytrk controls how the **sample's spectral profile** is scaled relative to the played note: at 0%, the profile is read without note-based transposition; at 100%, the profile follows the distance between the MIDI note and the Root Note.

12. Preset Manager

The preset window is accessed via the **Presets** button in the main interface. It is *non-modal* — you can adjust plugin parameters with it open. It stays always-on-top and remembers its screen position between sessions.

12.1 Navigation and Loading

Click a preset	Selects and immediately loads the preset into the plugin instance.
Click a column header	Sorts the list by the clicked column (Name, Category, or Fav). Click again to reverse.
Star (Fav)	Click the star on any preset to mark/unmark as favourite. Favourites show a filled gold star.
Init	The **Init** preset always appears at the top of the list regardless of sorting. Loads the clean initial state of the plugin.
Set Folder	Opens a browser to select the **VIVO Presets** folder. Preferably point to the root folder that contains the Presets/ and Samples/ subfolders. The plugin also accepts the Presets/ folder directly for legacy installations.

12.2 Preset File Formats

VIVO uses the proprietary **.pk2** format — a binary with LZ4 compression + AES-256-CTR encryption + HMAC-SHA256 authentication. The sample is embedded directly in the file, eliminating external dependencies. When loading samples through the plugin, the limit is 30 seconds.

.pk2	Current format. Sample embedded, encrypted, and authenticated. Single portable file.
.pks	Legacy v1 format. Sample referenced externally in the Samples/ folder. No encryption. Still compatible.

Favourites are persisted in a presets.json file in the presets folder. The plugin scans the folder for .pk2/.pks files and regenerates the index automatically when new files are found.

> ■ *To install new presets, copy the .pk2 files to the Presets/ subfolder inside your VIVO Presets folder. VIVO finds them automatically the next time you open the manager.*

13. Quick Parameter Reference

Consolidated table of all VIVO parameters for quick reference during production sessions.

Gain and Mix

Parameter	Range	Default	Description
Input Gain	-36 to +24 dB	-12 dB	Pre-harmonic filter gain
Output Gain	-24 to +36 dB	0 dB	Post-processing gain
Peak Q	1 – 30	4.0	Bandwidth of Peak filters (all 8)
Peak Vol	0 – 45 dB	0 dB	Global Peak filter bank gain in non-Resynth modes
Stereo	0 – 3%	0%	Stereo spread by L/R detune of Peak filters or Resynth oscillators
H1–H8 Gain	0 – 127	0	Individual gain per harmonic

Amplitude Envelope

Parameter	Range	Default	Description
Attack	1ms – 10s	10ms	Attack time (exponential convex)
Decay	1ms – 10s	100ms	Decay time (exponential concave)
Sustain	0.0 – 1.0	0.8	Sustain level
Release	1ms – 10s	200ms	Release time (exponential concave)

Sampler and Voice

Parameter	Range	Default	Description
Root Note	0 – 127	60 (C3)	Sample root note
Keytrack	0 – 100%	0%	Sample pitch tracking; in Resynth, becomes XKeytrk for scaling the spectral profile
Velocity	0 – 100%	100%	Velocity sensitivity
Voices	1 – 32	16	Maximum polyphony
Transpose	-36 to +36 st	0	Global transpose in semitones
Fine Tune	-100 to +100 cents	0	Fine tuning for the sample and Resynth oscillators; does not tune Peak filters

Global Filter

Parameter	Range	Default	Description
Filter Cutoff	20 – 20k Hz	20kHz	Cut frequency
Filter Q	0.1 – 20	0.1	Resonance
Filter Keytrack	0 – 100%	0%	Cutoff modulation by note
Env Amount	-2.0 – +2.0	0.0	Envelope depth on filter
F Attack	1ms – 10s	5ms	Filter envelope attack
F Decay	1ms – 10s	50ms	Filter envelope decay
F Sustain	0.0 – 1.0	0.6	Filter envelope sustain
F Release	1ms – 10s	100ms	Filter envelope release

Resynth Panel

Parameter	Range	Default	Description
Ring	-10 to +10	0	Oscillator decay: -10 ≈ 0.12s, 0 ≈ 7.5s, +10 ≈ 15s
Exciter	0 – 500ms	50ms	Excitation gate duration
Attack	1ms – 2s	5ms	Resynth oscillator attack
Release	10ms – 10s	2s	Resynth oscillator release
Inharmonicity	0.0 – 1.0	0.0	Upper partial stretching
Damping	0.0 – 2.0	1.0	Differential frequency damping
XTilt/Bright	0.0 – 1.0	1.0	Spectral amplitude tilt
Vel to Ring	0.0 – 1.0	0.0	Velocity sensitivity on Ring time
XFollow	0.0 – 1.0	0.0	Spectral peak tracking from sample
XTime	1ms – 2s	10ms	Spectral tracking speed

Delay

Parameter	Range	Default	Description
Time	10 – 2000ms	250ms	Echo time
Feedback	0 – 95%	30%	Delay feedback
Mix	0 – 100%	30%	Delay wet/dry

Reverb

Parameter	Range	Default	Description
IR Preset	Bright/Medium/Dark	Medium	Plate IR character (EMT-140)

Parameter	Range	Default	Description
Mix	0 – 100%	25%	Reverb wet/dry

Limiter

Parameter	Range	Default	Description
Maximize	0 – 18 dB	0 dB	Maximiser gain before limit