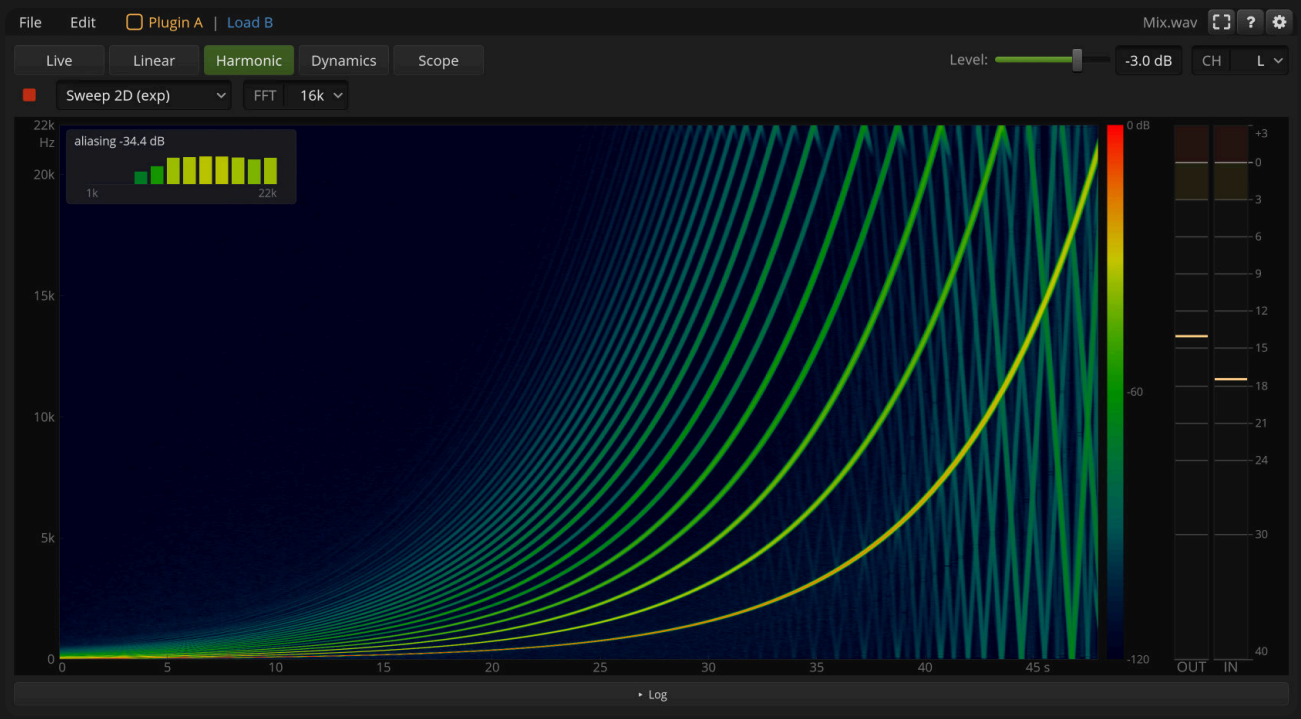


Examer — Manual

Plugin & outboard measurement.

Version 1.0.1 · Version history

Background

Examer started as an internal tool: we have measured every one of our plugins with scripts of our own — first in MATLAB, later in Python — and, before the first plugin, the audio scripts and small tools that came before it. The scripts answered one question: what does this plugin actually do. Measurements that are facts, not impressions.

The second question came from working with the first: how does it *differ*? From another plugin, from an older build, from its own other channel. A second slot and a null test turned one answer into a comparison. Match goes further: how close can one EQ get to another? It turns B's own knobs until the curves meet.

The measurements behind these plots are the ones our own releases pass through before they ship — the latency check that runs on every single measurement. Most of the views in this manual exist because at some point one of our own plugins surprised us, and we wanted to see exactly how.

Examer is that bench, cleaned up and given a face.

Overview

Examer loads a **VST2**, **VST3** or **Audio Unit** plugin and measures it — frequency response, phase and group delay, distortion by order, aliasing, dynamics behaviour, latency truth and more. Every measurement runs offline through a double-precision pipeline and re-runs automatically the moment you touch a control.

Compare plugins, builds or channels with the A/B null figures, or use Match to fit B to A. Measure hardware through the loop.

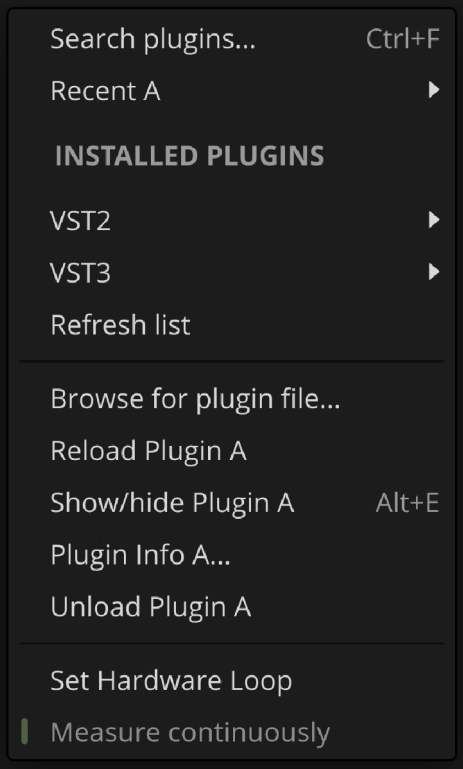
Examer is a measurement instrument. Adjust the hosted plugin in its own window and the curves follow.

Getting Started

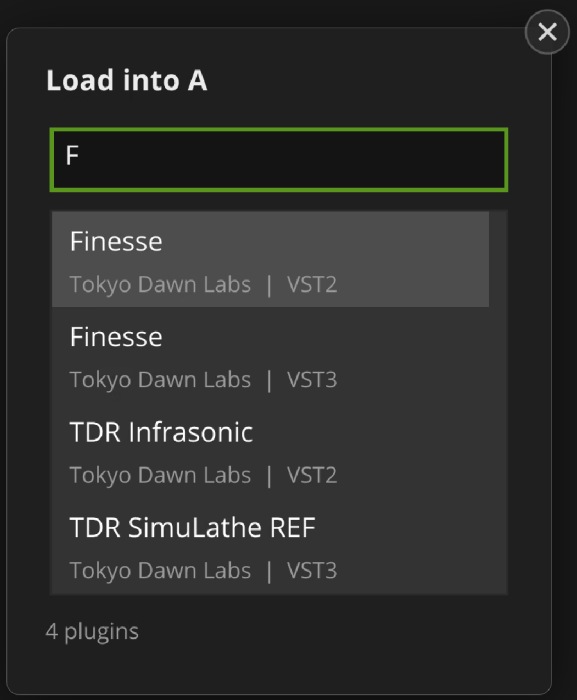
Licence. Examer needs a licence key. It is free and, like the keys of our plugins, comes from the Tokyo Dawn Records store and stays in your TDR account; the TDR Collector installs it along with Examer (ohlhorstdigital.com/examer shows how to get it). As long as it finds none, a card asks for it — log in with your TDR account (e-mail, password, *Log in*), or paste the key's text, drop its `.tdr` file on the card or pick it with *Open .tdr...* and press *Unlock*. A `.tdr` dropped on the window installs at once, at any time. The key is checked offline and stored with your other TDR keys; a portable copy also takes an `Examer.tdr` beside it (on a Mac beside the app). *Settings → Registration* shows whom it is licensed to and where the key file lies, and lets you *Log in with your TDR account* (e-mail, password, *Log in*); *Import key file...* installs a key file — a per-seat key only the TDR Collector can install, and Examer says so — and *Remove key* removes Examer's own key and no other TDR key.

Load a plugin. Use the slot menu in the status line, drag a plugin onto the window or pass its path on the command line. See System Requirements for formats by platform.

> **The slot menu.** Click *Load A* or *Load B*, or the loaded plugin's name. The menu lists *Search plugins...* first, then *Recent*, then every installed plugin under format, maker and name, then *Browse for plugin file...*.
>
> **Read once.** Examer scans the enabled plugin folders in the background and keeps the results. At startup and when folders change, it reads only new or changed files. The status line shows progress — *Scanning plugins 12/340*. Use *Refresh list* to read the list again.
>
> **Makers.** Examer reads the maker from the file's Windows version info or macOS Info.plist, falling back to the maker's folder. Many VST2 files start under *Unknown*. On first load Examer stores the maker the plugin reports for that file, across restarts, and updates the list immediately. It never guesses from names or neighbouring files.
>
> **Dragging.** Drop a plugin on the left half of the window (*Load into A*) or the right (*Load into B*) to replace that slot. Esc or leaving the window cancels. Drop an audio file to load the Live



- player.
- **Several plugins in one file.** A container's plugins appear individually in the slot menu and load without a wait. Listing them does not open each plugin. Open the file itself to see a list with maker and category. The last choice scrolls into view without being selected. Filter by name or maker, then click a row or use the arrow keys and Enter. The list will not load a plugin for its first quarter second. *Cancel* or Esc leaves the slot unchanged. No list opens while a container is being read or a slot is changing. The choice applies to B, Match and saved sessions too.
- **New plugins, and when one fails.** Examer scans in a separate process. A crash or 60 seconds without a response skips the file and leaves Examer running. *Settings → Plugins* lists the reason — *crashed while being read* or *stopped answering while being read*. Pick the file by hand to retry. The status line shows failed loads in red with the reason — for example *Load failed: 32-bit plugin*, *Intel-only plugin* or *crashed while being read*. Click it for the corresponding log entry. If the other slot is still loading, the new load waits.
- **Editor.** The editor docks in its own window beside Examer. The **A** and **B** buttons at the right of the menu bar reopen or raise it. Each slot's status-line square is filled while its editor is open. Click the square to close an uncovered editor or bring it forward, even from the taskbar or Dock. Help mode (**?**) explains the action and names its key. The **i** beside bypass in the editor title bar opens Plugin Info. A separate offline copy mirrors every setting so measurements never interrupt monitoring.



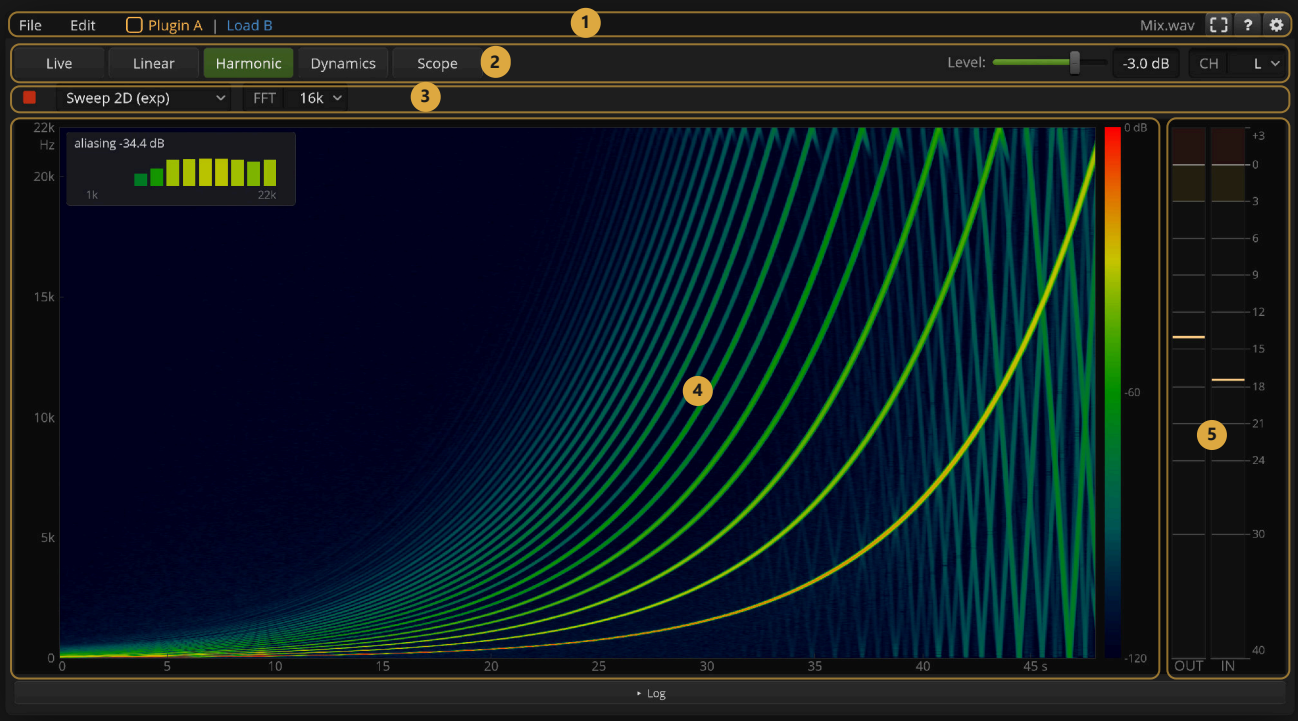
- **Search.** Choose *Search plugins...* in the slot menu, or press **Ctrl+F** (**Cmd+F**) for A or **Ctrl+Shift+F** (**Cmd+Shift+F**) for B. Type words from the name, maker or format. Every word must match, regardless of case. An empty field shows recently loaded plugins first. Scroll with the wheel. Click a result or use the arrow keys and Enter to load it. Esc or a click outside closes the panel. While the installed list is being read, the panel says so and fills in results as they arrive. Searching alone neither scans nor loads plugins.

Recent & Reload. Pick a previous load under *Recent* in the slot menu. To check a new build, choose *Reload Plugin A* or *Reload Plugin B*. Examer rereads the binary from disk and measures again. Plugin Info sits between Show/hide and Unload.

Measure. Pick a tab. Changing a plugin parameter or analyzer control restarts the measurement immediately, even mid-run. Longer runs show progress at the bottom of the plot. Returning to a mode restores the same result as a fresh run unless the plugins, their state, bypass, level, measurement rate, channel or mode settings have changed.

Measure other modes in the background (*Settings* → *General*, on by default) measures the current tab's other modes at low priority while you pause after a measurement. The first click or key stops it. This excludes Live and the hardware loop. Switch it off to free the processor on an older computer.

The Interface



1 Top bar

- **Menu bar** — *File* and *Edit*.
- **Slots A and B** — plugin A in yellow, B in blue; click the name or *Load A* / *Load B* for the slot menu and plugin search. The lit **A** or **B** button replaces that plugin with a wire for the measurement (**bypass**); with nothing active a red frame surrounds the buttons and a red **BYPASS** shows.
- **File and hints** — the loaded audio file, and an update hint when a new version exists.
- **Full screen, ?, gear** — full screen (**F11**), help mode on and off, and the settings card — lit green while it is open.

2. **Tabs, Level, Channel**
   - **Tabs** — the five modules, each with its own control row. The player belongs to Live: leaving Live pauses it, coming back resumes it.
   - **Level** — the stimulus, −60 to +20 dB; double-click: −3 dB. Through a plugin absolute dBFS, in the hardware loop headroom. Dynamics has its own levels, so it is not shown there.
   - **Channel** — **L**, **R**, **M** (L+R)/2 or **S** (L−R)/2 — what the analysis reads. **L/R** and **M/S** are a pair: both halves as two curves, using the B slot (A/B) — with a plugin in B as well, Linear shows both halves of both plugins.
3. **Control row** — the active tab's controls.
4. **Plot**
   - **Figures box** — the measurement's numbers — see boxes.
   - **Plot** — see Reading a Plot.
5. **OUT / IN** — OUT goes into the thing measured, IN comes back — the same for a plugin and a device on a cable. Left-click clears a clip, right-click sets floor, attack, fall and hold; the peak mark falls at 4 dB/s, the bar at 20 dB/s, and each measurement clears them.

The stimulus feeds all inputs identically, so on a channel-symmetric plugin L, R and M draw the same curve and S is silence. *Edit → Reset measurement values* puts the control rows' Hz and dB values back to their factory numbers and every value axis back to Auto, as one undo step.

> **Note:** Bypassing on the Linear tab tells you nothing: its deconvolution is self-normalising, so it draws a flat 0 dB line rather than the instrument's floor.



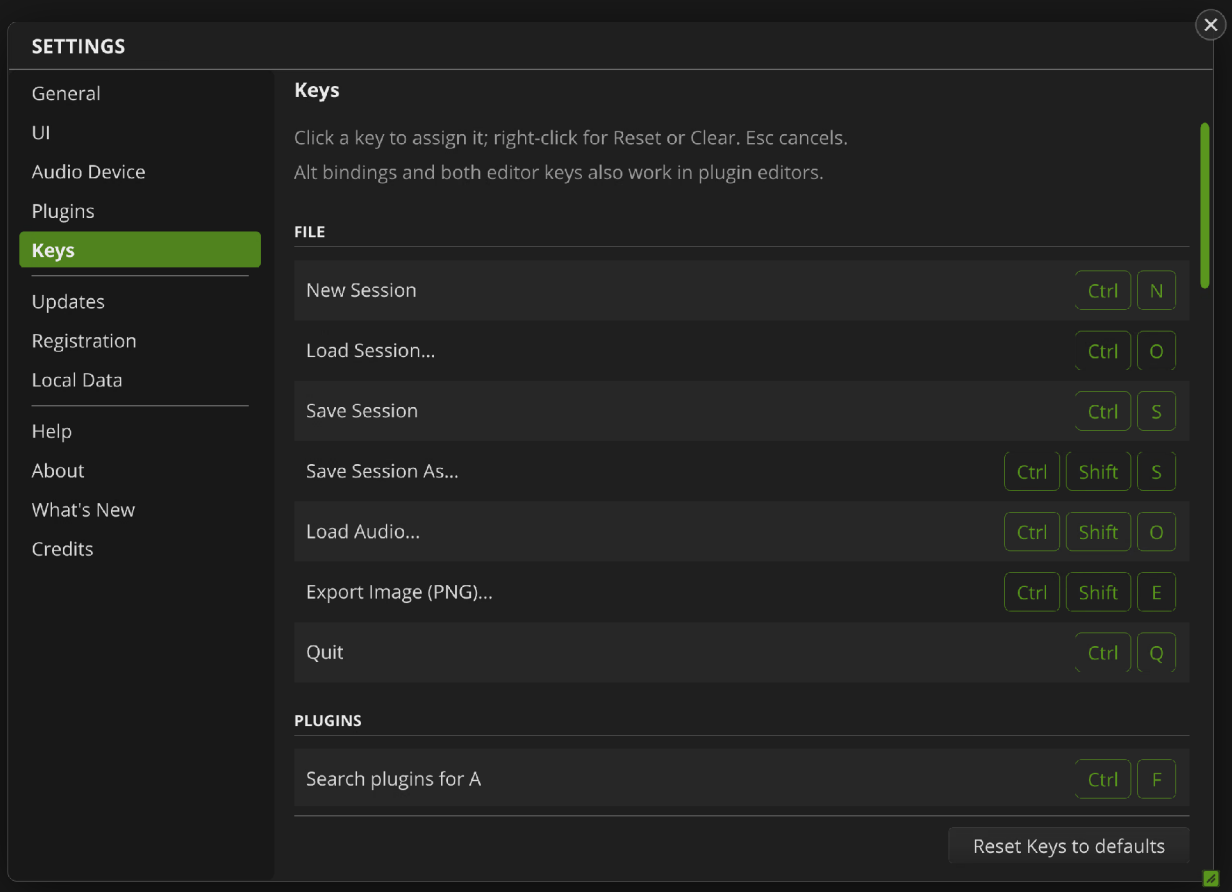
Help mode — the **?** key, or *Settings → Help → Help on the interface* — keeps everything usable and explains whatever you point at: a control, or the plot and how to read the measurement on show. Click the lit **?** to leave.

Keyboard.

- **Alt first.** We use **Alt** (**Option** on macOS) for tab, mode and value range shortcuts, so bare letters stay with a focused slider or combo. **Space** plays or stops the source on Live and starts or stops the measurement on the measurement tabs. **Ctrl+F** (**Cmd+F**) opens the plugin search. The Alt shortcuts work even while a plugin's editor has the focus; Space and Ctrl (Cmd) stay with the plugin there.
- **Plugin editors. Alt+E** and **Alt+B** show or hide the editor of plugin A or B, like a click on its square in the status line: one that is visible and not covered closes, any other comes to the front, opened if it was closed. The menu of the slot button offers *Bring Plugin A to Front* / *Bring Plugin B to Front*.
- **Files, help and zoom.** New, Open, Save and Save As for a session, loading audio, exporting an image, Help, Quit and zoom have keys too: **Ctrl+N**, **Ctrl+O**, **Ctrl+S**, **Ctrl+Shift+S**, **Ctrl+Shift+O** (audio), **Ctrl+Shift+E** (image), **F1** (help), **Ctrl+Q**, and **Ctrl++** / **Ctrl+-** to zoom

on any tab (**Ctrl+=** and the keypad work too); on macOS **Cmd** instead of Ctrl, and **Cmd+?** (**Cmd+Shift+/**) for help. Help opens *Settings → Help* with the manual and support links; the settings stay on **Ctrl+,** (**Cmd+,**). On the Mac a menu action cannot take **Cmd+C**, **V**, **X**, **A** or **Z** or a bare function key, and while another plugin's own panel — a colour picker, say — is open in front, Examer's keys are off on purpose.

- **Your own keys.** The full list is on the settings card's *Keys* page, and every key there can be changed: click a key cap and press the new key — Esc cancels, Delete or Backspace clears it. A right-click on a cap offers *Reset to default* or *Clear*; *Reset Keys to defaults* sets them all back. A key that is already taken is refused with the name of the action that has it; navigation, help, Undo and closing stay reserved. The menus show your keys, and your keys for *Bring Plugin A/B to Front* work in a plugin's editor too.



- **Sliders.** The wheel on a slider steps in its own unit — one dB, a third of an octave, one sample — **Shift** for the fine step. The value field beside a slider can be dragged and wheeled the same way, and a double-click resets it.

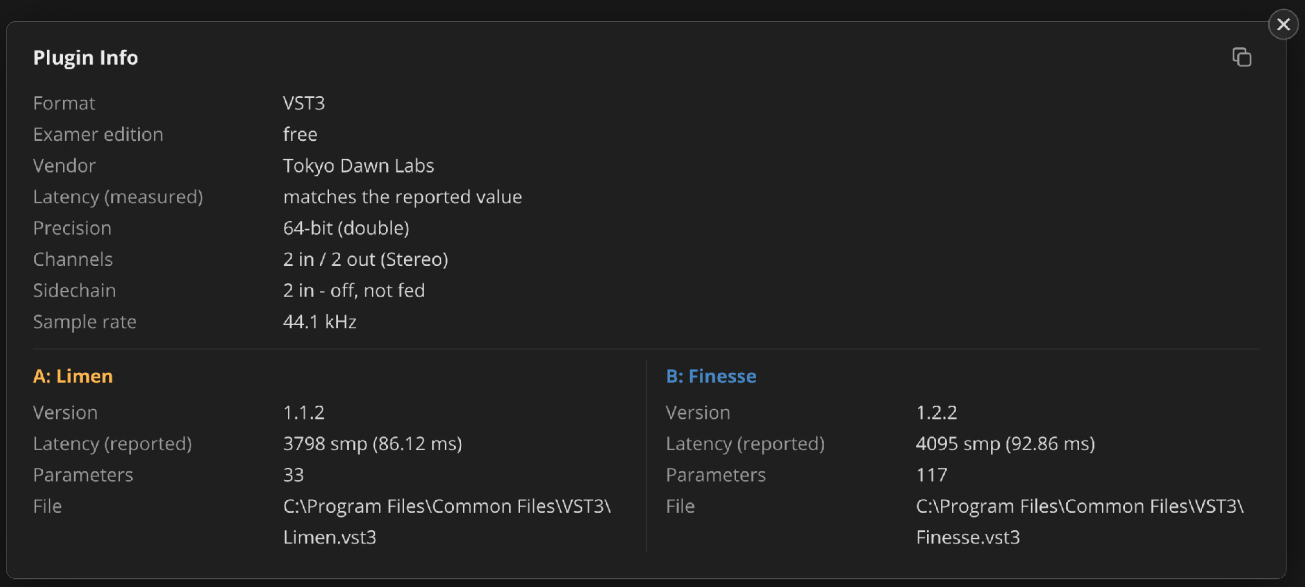
Latency check. With a plugin in A or B, open *Settings → Help → Plugin info*, choose *Plugin Info A...* or *B...* in the slot menu, or click **i** in the plugin title bar. Each slot shows its reported latency beside the value measured by cross-correlation. Examer measures B in its own Linear pass or when the card opens.

> **Note:** A difference of a few samples is not flagged. The correlation peak follows the impulse response's centre of mass. Phase rotation in an allpass stage, reverb or steep filter can shift the peak even when the reported latency is correct.

Each sidechain or aux bus has a row with its name, channel count, on/off state and feed. A VST3 sidechain is off and receives no signal. A VST2 sidechain stays on and receives the main test signal, except in slot B on Live, where it receives silence. If a VST2 declares more channels than were opened, *Declared* gives its channel count. Extra inputs receive silence.

For a plugin that needs time to settle, such as a dynamic-convolution emulation, Examer repeats captures a second apart until two agree, up to six passes. If none agree, the *Measurement* row reads *Did not settle after 6 passes - measured as it is; not cached*.

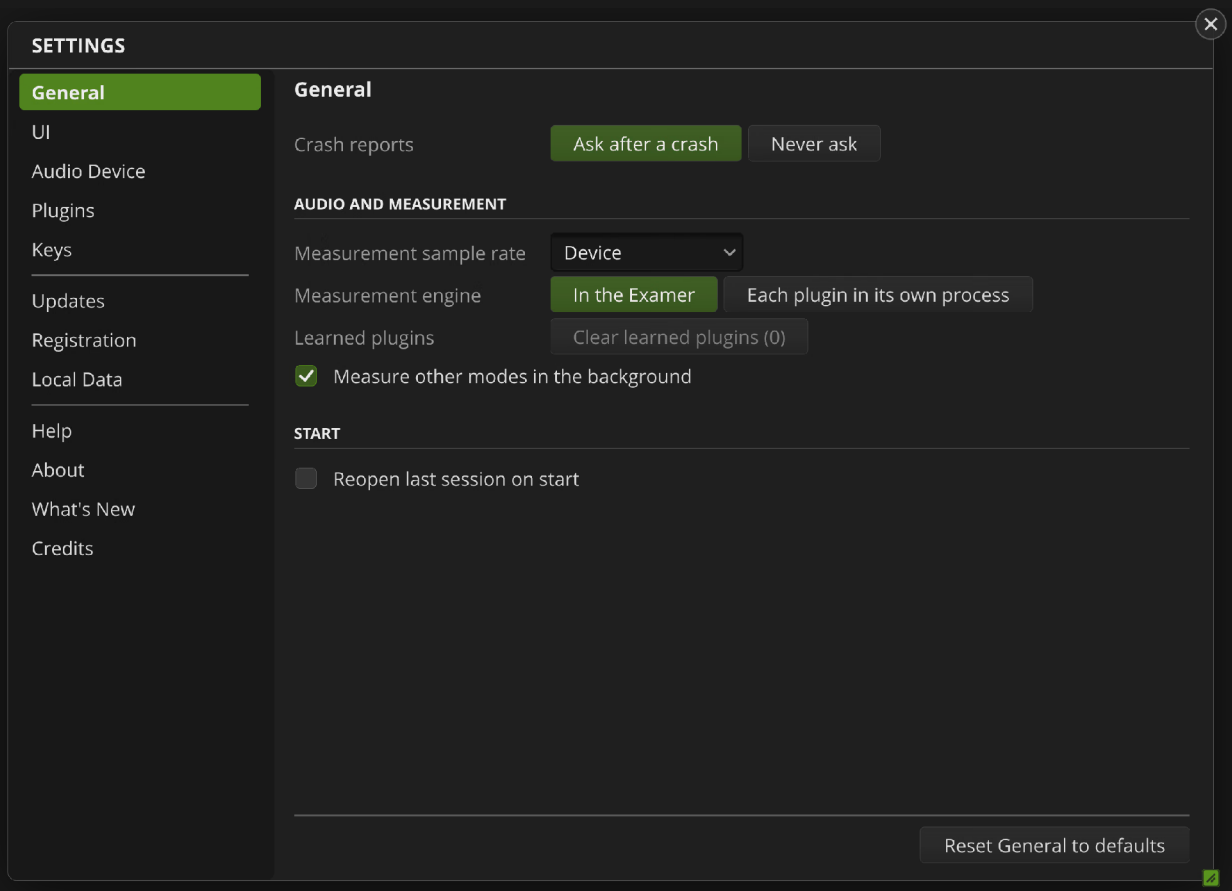
Click inside the card to select text. Close it with its X, Esc or a click outside. *Copy* briefly reads *Copied* and copies one tab-separated name and value per line, shared rows first, then A and B under their titles.



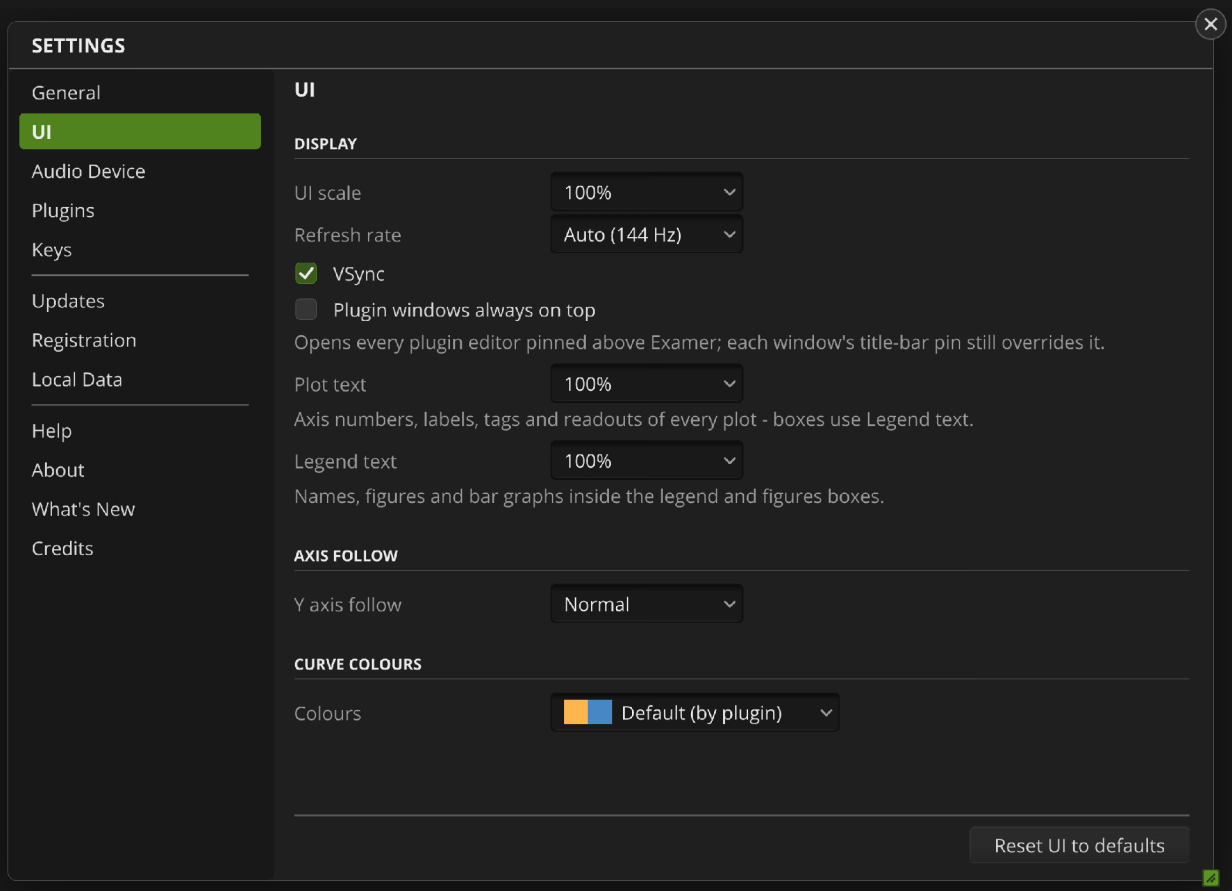
Settings. The gear (a second click closes it), **Ctrl+,** or, on macOS, **Cmd+,** and *Preferences...* open one card, its pages at the left in three groups — the instrument, then updates, registration and local data, then help, about and credits. Each page ends in its own reset, one step for Undo. On macOS *About Examer* in the app menu opens it at *About*. *File* and *Edit* stay menus.

The instrument

- *General* — crash reports, measurement sample rate, measurement engine with the learned plugins, *Measure other modes in the background* and *START → Reopen last session on start*. Its reset sets the measurement engine to *In the Examer*, the device's rate, background measuring on, no reopening; it keeps the audio device, the crash-report choice, everything on UI and the learned plugins — *Clear learned plugins* alone removes those.



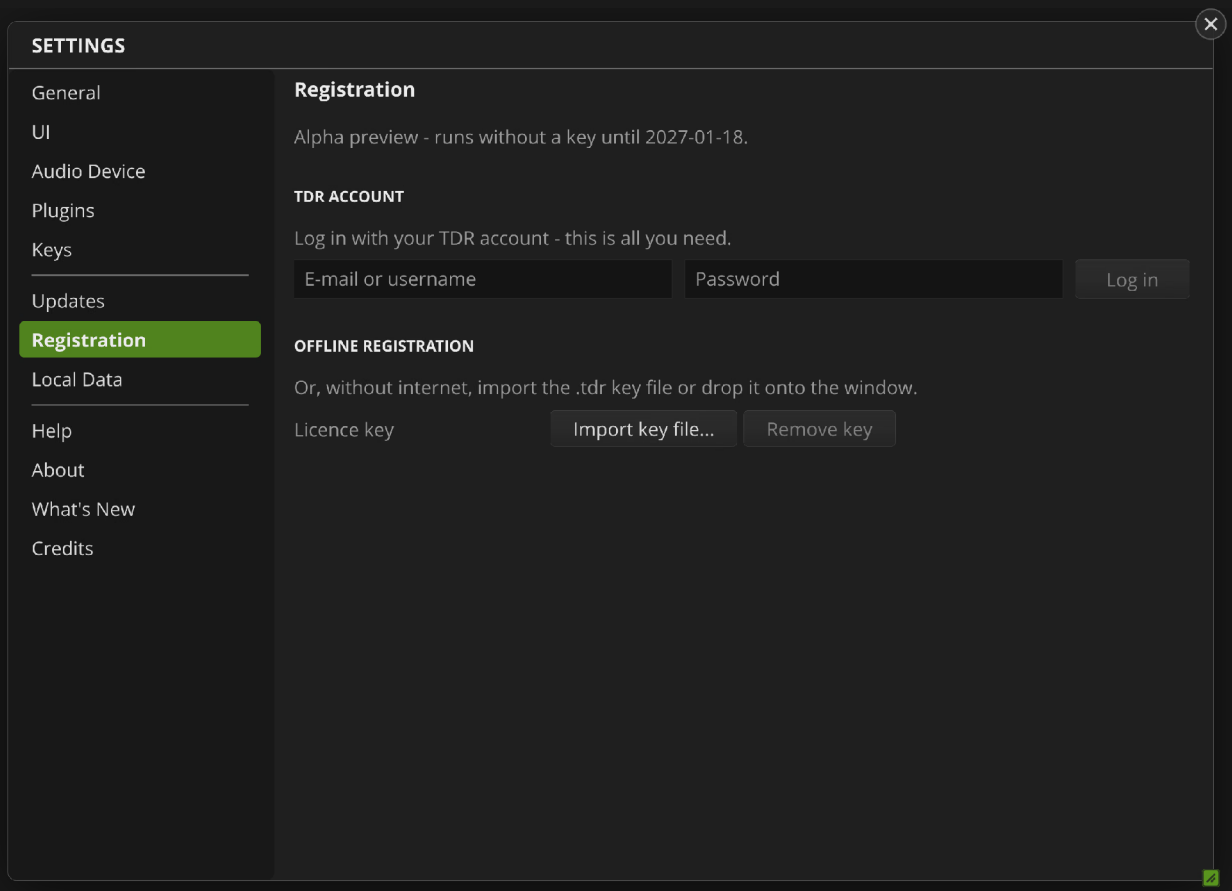
- *UI — DISPLAY*: UI scale in steps from 50 to 150 % as far as the monitor allows, or *Custom...* from 75 to 200 % (the window keeps its size); refresh rate and VSync; *Plot text*, which sizes the texts a plot draws — axis numbers and units, cursor readout, marker labels, the hint strip — in steps from 100 to 200 % (default 100 %) or *Custom...* from 75 to 200 %, independent of the UI scale. *Custom...* asks for a whole percentage and then reads *Custom (83%)...* in the list. Curves, grid and ticks keep their size. Axis margins grow as needed above 100 % and keep their size below it. Plot text stays at least 13 px. *Legend text* sizes the text in the legend, the figures box, the Live DSP box and the Match readout from 100 to 200 % (default 100 %). If no *Legend text* value is stored yet, it takes over the *Plot text* value once at start; after that the two are set separately. The boxes grow with the text. The legend's right-click menu has the same *Legend text* setting. Both settings apply to saved and copied images. *Plugin windows always on top* keeps open plugin editor windows above other windows. Below DISPLAY, the curve colours. On the Mac only, *Plugin window title bar*: *Examer* (the default) or *System*, the macOS title bar — the plugin window then has no pin, no *BYPASS* key and no coloured logo; bypass stays in the main window. Beside it, also Mac only, *Plugin window drawing*: *Layer* (the default) or *Classic*. Choose Classic if a plugin draws incorrectly in Examer's windows. *Reset UI to defaults* sets UI scale, Plot text and Legend text to 100 % (the UI scale to the monitor's floor if 100 % lies below it), resets the window to 1120 × 640, turns Plugin windows always on top off, sets the curve colours to *Default (by plugin)*, forgetting your own, and sets VSync on and the refresh rate to Auto.



- *Audio Device* — the interface, its sample rate and buffer, and what Examer measures and monitors through it: below.
- *Plugins* — the folders behind the slot menus' list of installed plugins: below.
- *Keys* — the shortcuts, each one yours to change.

Updates, registration, local data

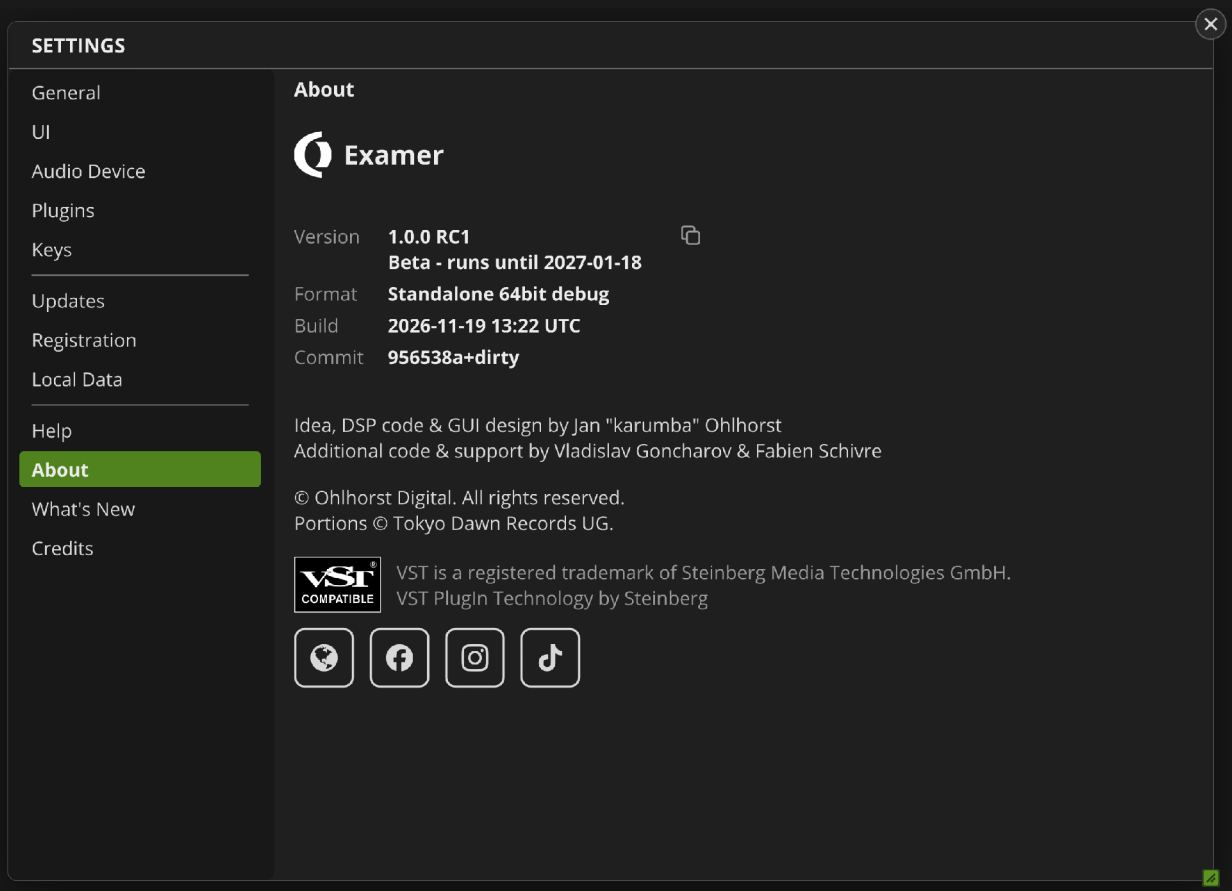
- *Updates* — whether Examer is up to date and when it last looked, or which version is waiting; *Check now*, *Download x.y.z…* once there is one, *Check for updates on start* — see updates. Under *NOTICES*, *Show notices from Ohlhorst Digital* (on by default): a slim bar under the menu row, closed with its cross, for urgent or important news about your version — a known fault and how to avoid it, never advertising. It comes with the update check, never with a request of its own; switched off, the bar stays hidden and the list of plugins that need special handling still applies.
- *Registration* — whom the licence is for and where its key file lies; *Log in with your TDR account* (e-mail, password, *Log in*), *Import key file…* — or drop the `.tdr` on the window —, *Remove key* (Examer's own only).



- *Local Data* — the settings folder with *Show*; *Export Zip*... packs the settings and the analyzer presets — no licence, no logs — for another machine, *Import Zip*... takes such a file, applied at the next start. *Clean up* deletes, after asking, the old crash and hang reports, memory dumps (`.dmp`) and logs from the settings folder; the line under it says how many and how large — *7 files, 10.7 KB* — and with nothing to remove the button is grey. The settings, the analyzer presets, the licence key, reports not yet sent and the remembered contact address stay.

Help

- *Help* — the user manual, support, the newsletter, the keyboard shortcuts (they open *Keys*), help mode, *Report a problem*... and, while a plugin is loaded, *Plugin info*.
- *About* — version, format, build and commit, the authors, copyright, the VST logo with its notes and the website link below it. *Copy version info* copies the version summary, including the commit.



- *What's New* — what changed in this version.
- *Credits* — what Examer is built with, each component linked to its licence on our website, *Show licence texts* for the full texts in the app, and the people who tested it.

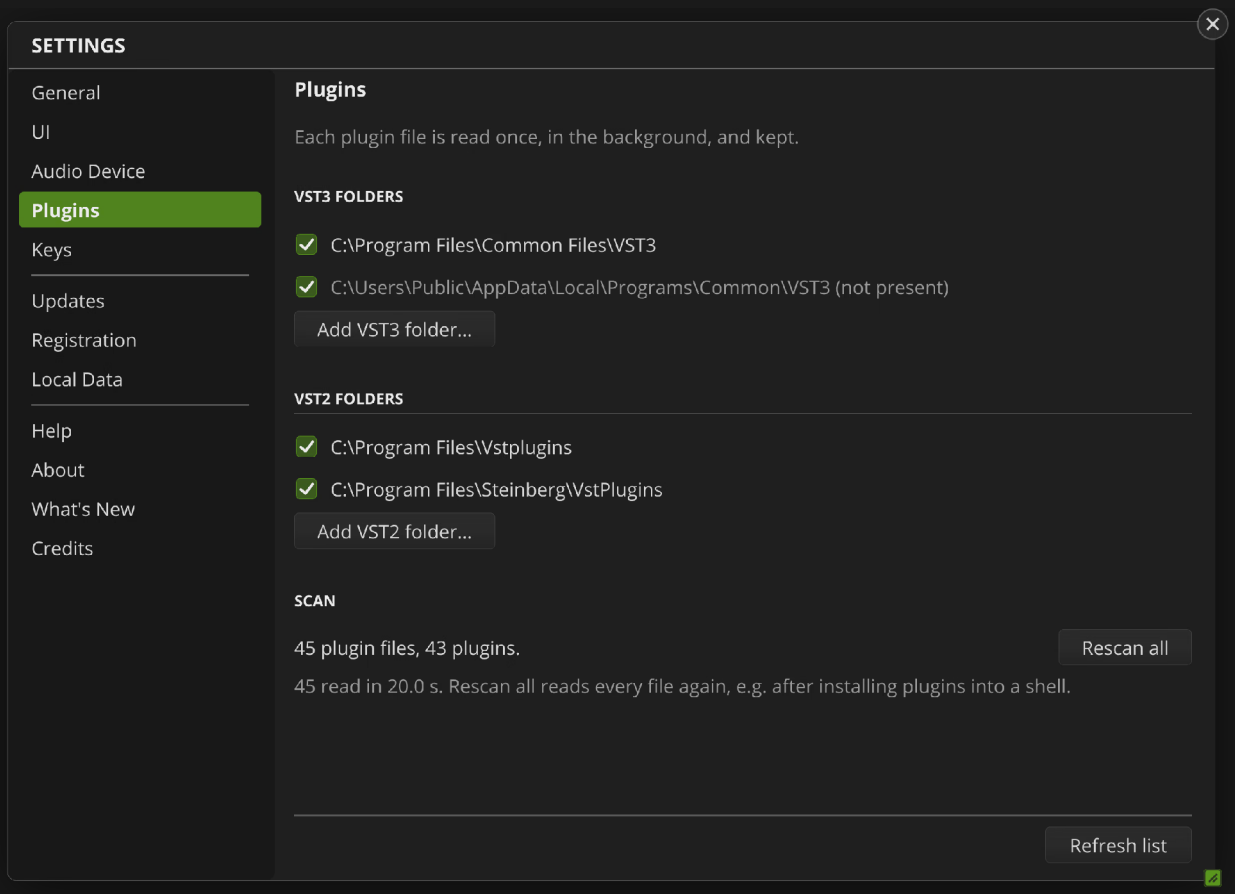
Audio Device. *Device* (or *Output* and *Input*), *Sample rate*, *Audio buffer size*, *Interface* with *Test* and, where the driver has one, *Control panel* or *Reset device*. *ROUTING* has three rows in the order the signal takes, each a choice of channel pair by its name (*3/4 Analog 3 + Analog 4*) with a line on what it is: *Measurement out*, where the sweep leaves for the gear's input; *Measurement in*, where the gear's output comes back and is recorded; *Monitor out*, your speakers, silent while a sweep runs unless the return is monitored. Under them *Monitor the return while measuring* with its *Level*, then the routing warnings in yellow and always the tip for a sweep you can hear; the open channels. A setup the device refuses shows a warning line.

Curve colours. *CURVE COLOURS* on *UI*, under DISPLAY, decides how the A and B curves are coloured. *Colours*: *Default (by plugin)* — A yellow, B blue, a pair's second channel dashed; *L/R colours* — L green, R red, M blue, S purple, sum and mono white; it reads *Custom* while neither is in force. Five rows per slot set them one by one — *A: L*, *A: R*, *A: M*, *A: S*, *A: sum or mono* and the same for B — each *Default*, one of the kit's colours (yellow, green, red, blue, purple, white, pink, turquoise) or *Custom...* with a colour picker. L, R, M and S colour that channel alone or within its pair; *sum or mono* covers the Live spectrum (the channels' mean). The channel choice itself stays one for both slots — A and B are always measured on the same channel or pair. Where B has A's colour for the same channel it is dashed, a pair's second channel with the first one's colour too, and both at once dotted. The colours hold on every tab for the A and B curves, the legend, the

info box and the meter bars (IN and OUT follow A's L and R); the input curve and the Hammerstein family keep their own, and the slot names stay yellow and blue. A right-click on the legend offers the same under *Curve colours*, its *Each colour...* opening this page. Each choice is one step for Undo; *Reset UI to defaults* brings back the default.

Plugins. Under *VST3 FOLDERS* and *VST2 FOLDERS*, tick a box or click its path to include that folder and its subfolders in the slot menus. Untick all but one to list a single folder. Re-enabling a folder restores its entries on the next rebuild without loading plugins. The scan cache is `plugin_scan.xml` in the settings folder, or beside a portable copy.

- Standard folders can only be unticked. For VST2 on Windows these are the registry's `VSTPluginsPath`, `Program Files\Steinberg\VstPlugins`, `Program Files\VstPlugins` and `Program Files\Common Files\VST2`. Missing folders read *not present*. Audio Units come from the macOS registry and need no folders.
- Use *Add VST3 folder...* or *Add VST2 folder...* below each list. A DAW's own plugin folder must be added here. Host-bound plugins still load only in their own host. Remove your own folders with **×**. Each tick, addition or removal is one Undo step and survives a restart.
- An unreachable folder stays listed with its path in red and the reason in help mode. A line below the lists reports time or size limits. On the first scan after restart a slow folder may miss the initial list. The slot menu and search name the pending folder and add its plugins when it answers. If it never answers, Examer keeps its previous entries.
- *Refresh list* rereads the list. Under *SCAN*, a progress bar shows *Reading plugins: 12 of 340 files* and the current file, or *<file> - 3 of 40 plugins* for a container. The final count reads, for example, *340 plugin files, 1210 plugins, 2 skipped.* Skipped files include the reason. *Cancel* stops the scan. Use *Rescan all* to reread every file when plugins have been added inside a container whose file appears unchanged.



Questions are cards. Whatever Examer asks — *Rename*, *Save Preset*, a *Custom…* range, the match setup, the licence key, an update — and every notice comes up as a card in the window. Only the file dialogs, the plugin editors and an ASIO driver's control panel open windows of their own.

Presets (*File → Analyzer Presets*) are named snapshots of the whole analyzer setup; they never touch the plugin, so they are safe to switch mid-session.

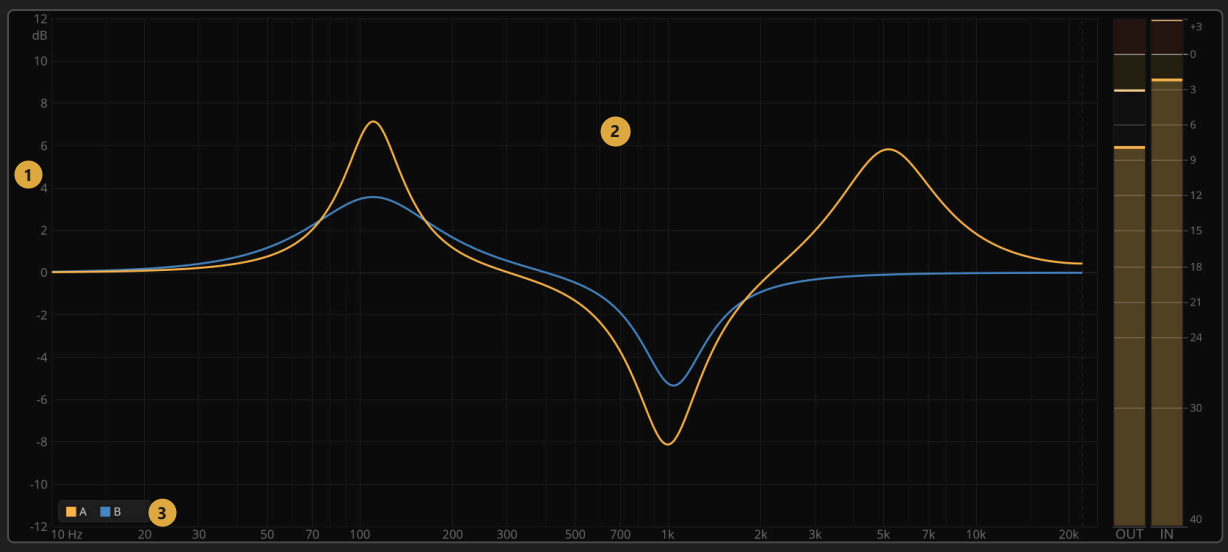
Sessions. *File → Save Session* writes one `.examer` file with what a preset leaves out: plugin A and B with their complete state, the analyzer and match setup, the audio file and the display aliases. *Settings → General → Reopen last session on start* starts where you left off, as `--session <file>` does. Plain *Save Session* greys out once the loaded plugins no longer match the file, leaving *Save As*. A plugin editor's pin, left of its close cross, keeps it on top; the power symbol beside it bypasses that slot — lit in the slot's colour, A yellow and B blue, while it plays, red while it is bypassed.

Undo takes back changes to plugin A and B one gesture at a time, A and B apart; inside a plugin's own editor its own undo answers. *Edit → Undo History…* lists every change with its old and new value — click one to go there. The history starts at the load and is not saved with a session.

Reading a Plot

Every measurement view answers to the same gestures, so what is learned on one plot works on all of them.

On the plot



1. **Value axis** — a right click opens the range menu; a hand cursor marks the strip.
2. **Plot face** — readout, zoom and pan — the table below; a right click opens the plot menu.
3. **Legend** — one chip per curve — Legend.

Do	What happens
Point at the plot	near a curve — within a few pixels at the pointer's position — the readout snaps to it: x and that curve's own value in its own unit, a dot in its colour, the curve lit for a moment, and with several curves its name; over the grey magnitude in the Phase view that is dB on the right axis, not degrees. Away from the curves, or with **Alt** (**Option**) held, a free crosshair with the exact values — frequency and level, time and level, in and out; on the 2D sweep the cell's value. The plot menu switches it off for a clean picture.
Drag a rectangle	zoom; again inside it to go further. The rectangle appears after 6 px of mouse travel, and only one of at least 24 × 24 px zooms (with **Shift**, 16 px of width) — anything smaller is a plain click. The sizes are the plot's own pixels and grow with UI Scale. It starts only where the curves are — not on a meter, an axis strip or the margin — and a drag out of that area stops at its edge. **Shift**: the width only.
Alt/**Option**+click where the curves are, without dragging	back to the zoom before the last rectangle — again and again, down to where you started; with no step left it releases the zoom. **Alt**+drag still draws a rectangle.
Wheel	zoom around the pointer, 15 % per notch (a fast spin counts at most three). **Shift**: the value axis alone; **Alt**: the x axis alone. A new measurement run keeps the zoom.
Middle button, drag, or **Ctrl**+drag (**Cmd**+drag)	pan — with Ctrl or Cmd no middle button is needed, on a trackpad too
Fit value range (**Alt+F**), middle double-click, *Fit Y to curve*	fits the value axis to the curve inside the visible x span. Available outside Live and the 2D views.
Double-click the plot face, or *Reset zoom* (plot menu)	back to the whole measurement — on every measured tab; not on the legend, the figures box or the axis strips

Zooming never loses the curve: a step that would push it out slides the window back onto it, and zooming out ends by releasing the zoom entirely. A curve that leaves the plot is cut at the frame along its real slope, never drawn flat along the edge.

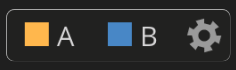
The value axis

Alt+A (*Auto value range*) toggles Auto in every view with a value range. The range menu's presets differ per view — degrees on Phase, down to −200 dB for Sweep: THD, whose curve can sit below the usual floor. **Auto** follows the measurement and is the default wherever the axis is not a convention: it widens within a moment when a curve grows, but narrows only once the curve has stayed smaller for 6 s, so the frame does not jump while you turn a knob; a fixed range switches it off for that view, and *Edit → Reset measurement values* restores Auto on every axis. Each view, including individual Harmonic modes and Scope views, keeps its range, Auto and zoom until restart. On Harmonic the same menu holds the noise line.

The magnitude underlay

Phase and Group Delay can draw the magnitude curve behind them in grey — its own *Magnitude* chip in the legend. It answers "yes, but where *is* that filter": a phase turn means something different over a boost than over a dip. A right click on its narrow dB scale at the right sets its window: **Auto**, the default, fits the magnitude curve in the Magnitude view's round steps; or ±3 to ±48 dB.

Legend



Click a chip	**that curve** on or off, the others stay; a switched-off chip dims and is struck through. It switches on release, when the mouse has moved less than 3 px
Ctrl+click (**Cmd+click**) or **Alt+click**	**only that curve**; the same again shows all
Drag the frame, off a chip, or a chip by 3 px or more	moves the legend; never starts a zoom. The place is kept per tab and view, across a restart
A result that is missing	never in the legend — the plot says **Not measurable** in amber with the reason, the controls that cause it framed in amber, and a key that repairs it where one can: *Use plugin chain*. A partial result keeps its curves and shows the reason as a strip at the top
The gear (on hover)	The legend menu. While its menu is open, the gear stays shown and lit
Right-click off a chip	show, hide or invert all, *Placement* on every view, *Legend text* (100 to 200 %, as in *Settings → UI*), *Curve colours* (the same as there), *Stack vertically* — one entry per line in a corner, top right first, at most half the plot high before a second column starts; it is remembered and goes into saved and copied images

"Only" and "all" count every curve chip on screen — A, B, a view's extra curves and *Magnitude* — on every tab and in the figures box. A saved or copied picture lists only the curves the plot shows. It switches the drawing, not the measurement. The A / B choice under the 2D spectrogram picks the chain and hides nothing; with A switched off, Linear and Scope keep the struck *A* chip so one click brings it back.

The figures box

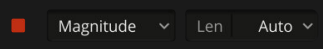
The measurement figures sit in a translucent box that places itself where it hides the least — the spot farthest from any curve — afresh on every tab, view and sub-mode change. On several tabs the box *is* the legend: the Dynamics figures carry one clickable row per curve. It has the legend's frame and gear and moves the same way.

The plot menu

A right click on the plot face: *Reset zoom*, **Save image (PNG)**, **Copy image to clipboard**, six box positions and the legend and cursor toggles. Save image opens the same dialog as *File → Export Image (PNG)...*: the name *<plugin> - <view>* in the folder last used for an export; it asks before overwriting a file and adds `.png` when left off. While a view has nothing measured, the menu greys Save image and Copy image, and the File entry is greyed. *Box placement* moves the figures box, or the legend on a view without one.

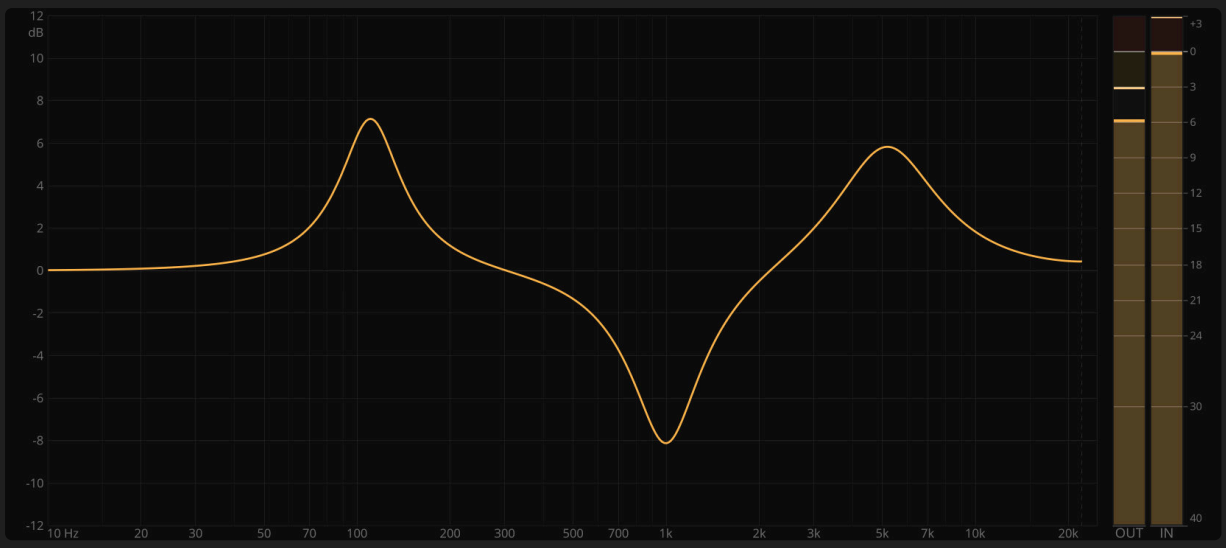
Saving or copying the plot uses its on-screen size in logical pixels. If it is larger than 1920 × 1080, Examer scales it down proportionally to fit. Each image holds the plot with axes, legend and figures, the legend on an opaque ground, and leaves out the OUT / IN meters, the pointer and readout, a zoom band, a running measurement's progress and the gear.

Linear



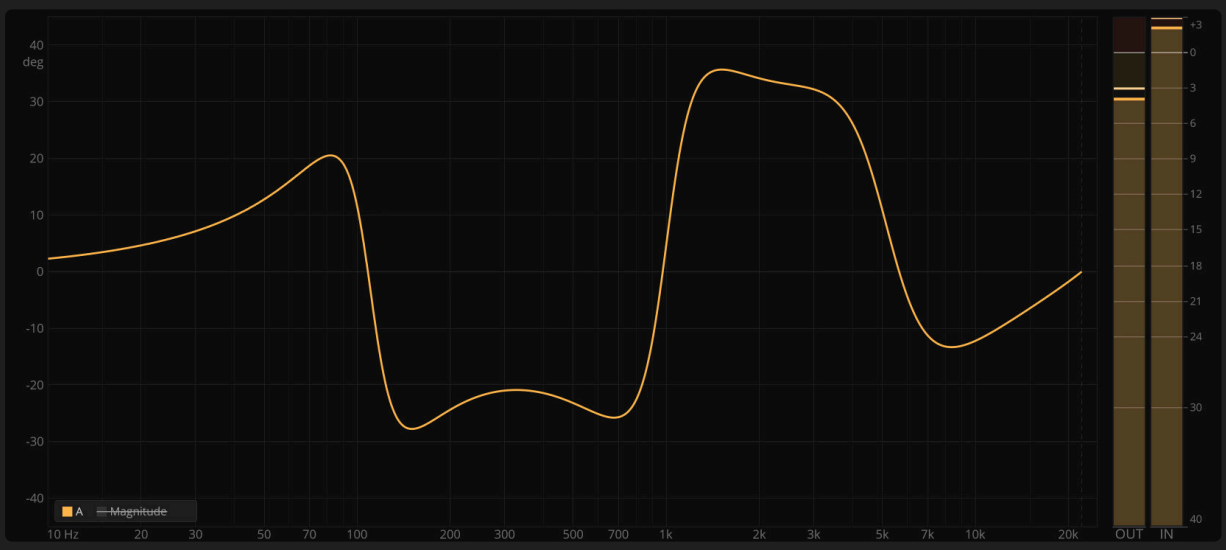
An exponential sweep with complex deconvolution. *Len* in the control row sets its length: 0.375, 0.75, 1.5, 3 or 6 s at every sample rate, or *Auto*, a plugin's default. Auto follows a control while it moves with short 0.375 s sweeps and measures once with 6 s when it rests — a green strip under the plot shows that pass's progress. The hardware loop has no Auto and starts at 1.5 s. Zooming never measures again. The view combo switches between four readings of the same measurement:

The harmonics stay out. A plugin that distorts answers the sweep with harmonics as well, and after the deconvolution they arrive *before* the impulse — the higher the order, the earlier. Magnitude, phase and group delay are read from the impulse with these packets gated out: the gate keeps the response and a window ahead of it up to 0.8× the arrival of the 2nd harmonic — about 98 ms with a 1.5 s sweep at 48 kHz, at most 16384 samples (about 340 ms at 48 kHz, what Auto's 6 s sweep reaches). A linear plugin reads exactly as without the gate; a saturating EQ, a tape or a tube model loses the fine ripple its harmonics used to leave in the bass. Where a linear-phase plugin's pre-ringing, as long as its reported latency, would reach the harmonics, Examer leaves the gate off rather than cut it; a longer *Len* puts the harmonics further from the response. The Impulse view still shows the whole impulse. [1]



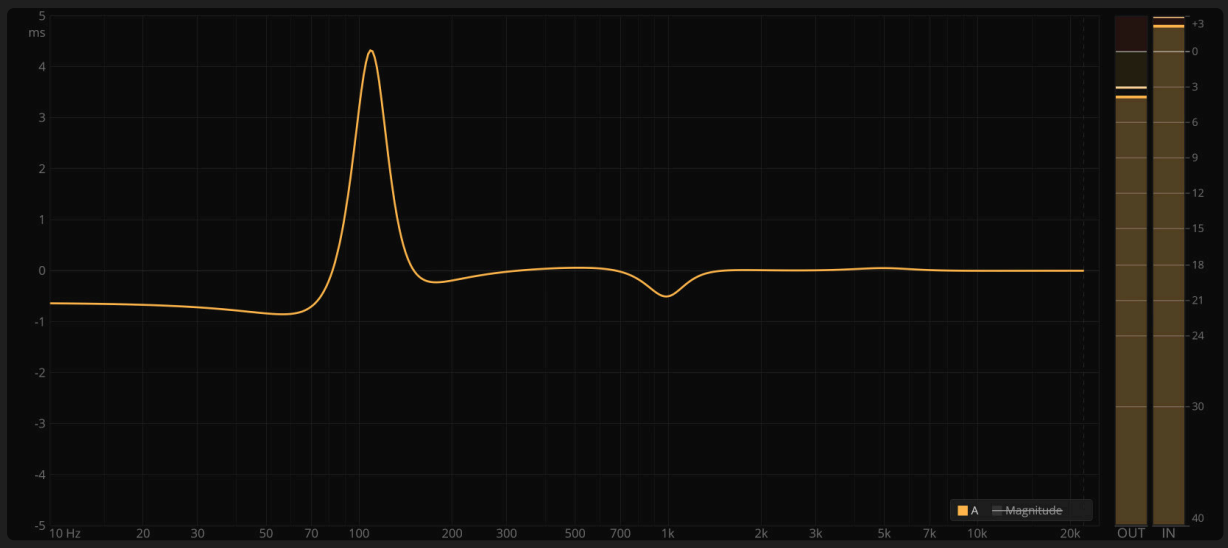
Magnitude

The frequency response — the plugin's gain over frequency. The value axis follows the curve by default, snapping to fixed steps from ±1 dB out to ±120; any range in between can be typed into the axis dialog.



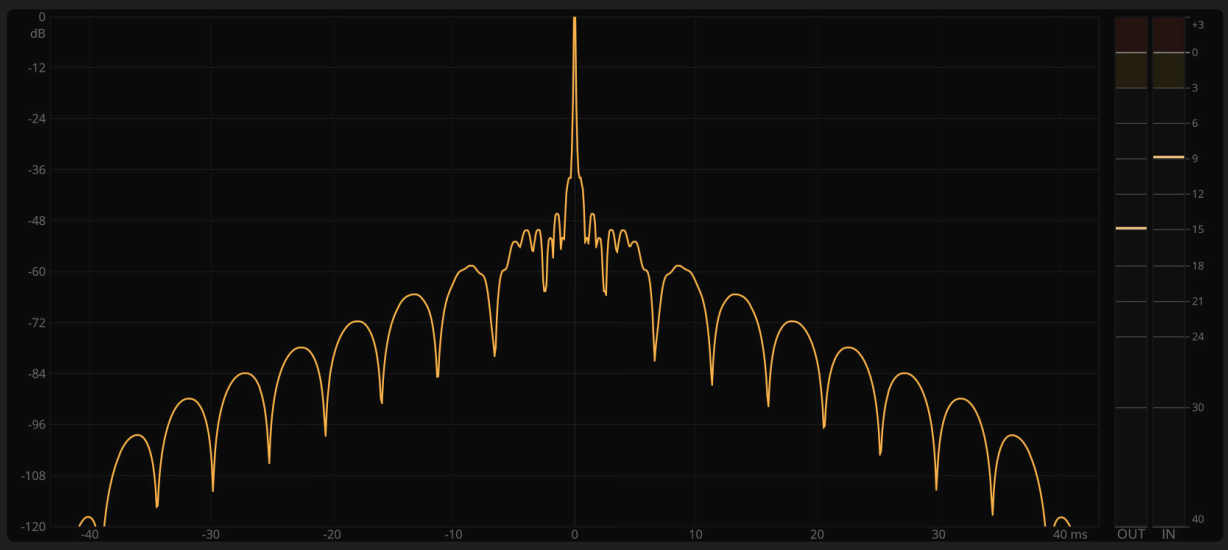
Phase

The phase of the EQ curve from the magnitude plot: a gentle musical EQ move barely turns ±15°. The value axis follows the curve, as on every Linear view, in steps from ±1° to ±135°; a curve that uses the whole circle gets the ±190° frame, where the wrap at ±180° is read. To see *how little* phase a setting costs against the full circle, pick that widest range, labelled every 45°, in the range menu.



Group Delay

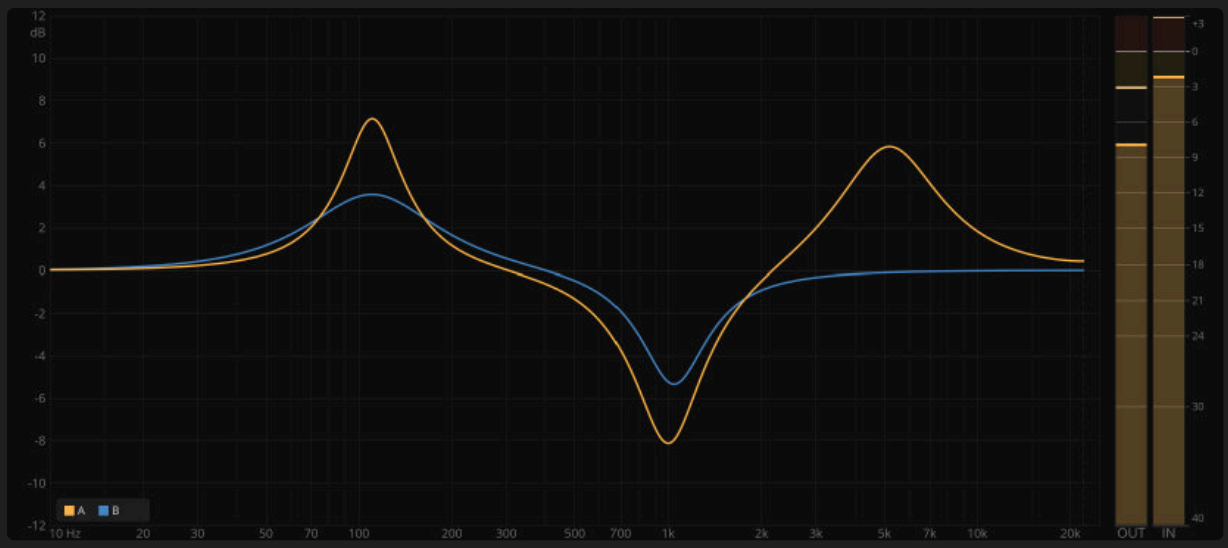
Group delay makes the same information readable as time: the low-shelf boost delays the lows by a fraction of a millisecond. Give the ms axis a fixed range when a curve is flatter or wilder than the default ±10 ms window.



Impulse

The impulse view above shows a linear-phase processor: the symmetric skirt *left* of 0 ms is pre-ringing — energy that arrives before the main impulse. A minimum-phase EQ would show nothing left of zero.

The trace is a true peak envelope on the sample grid. Its window runs from where the pre-ringing starts to where the response has decayed 100 dB below its peak, so *Full range*, the default, is a few milliseconds on an EQ and seconds on a reverb; *Auto frame* in the right-click menu crops the axes onto the part that carries energy.

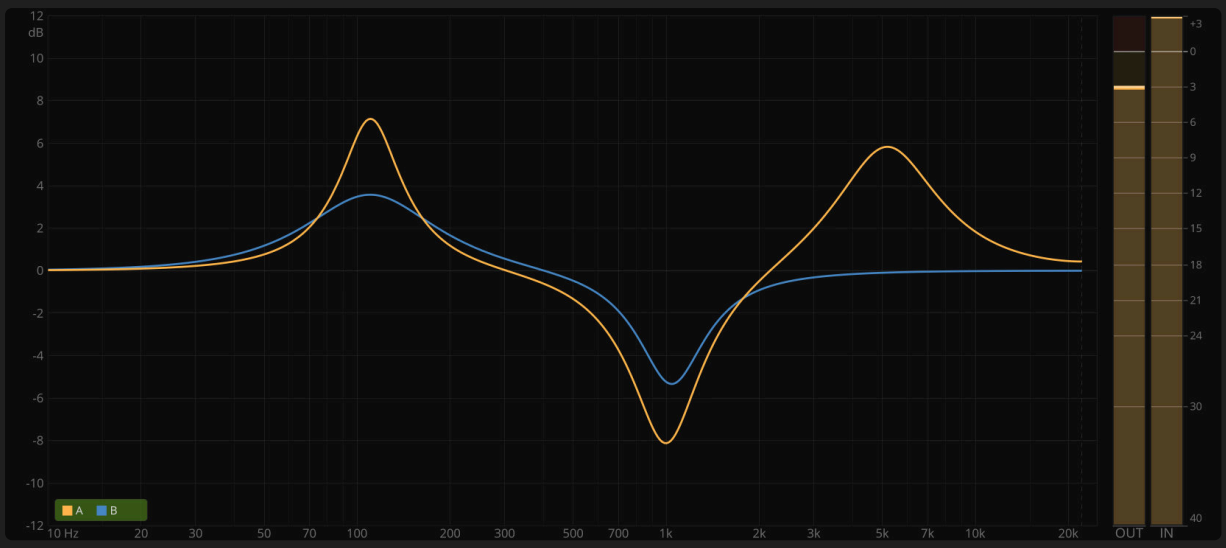


A/B comparison

Click *Load B* or the loaded plugin's name in the status line and choose the second plugin from the slot menu. Both render in parallel, so the pair costs one measurement, and a knob turned on either re-measures both. Above: a hardness reducer's midrange dip (yellow) against an EQ curve (blue); two identical builds would leave nothing visible.

- **A yellow, B blue**, everywhere: line plots draw B under A, curve families draw B dashed, figures boxes add B's numbers in blue, the THD bar row a blue bar per order.
- **B on its own.** A plugin loaded only in B is measured on every tab, in B's blue and named B in exports, figures and hints; Live plays B and goes back to A once A is loaded. Match needs a plugin in A.
- **Before and after.** Right-click **A** or **B** and choose *Clone A → B* to copy A with its current state.
- **B as a channel pair.** The channel selector's **L/R** and **M/S** put a second *channel* of A into the B curve: curves on top of each other are a processor treating both halves alike, any gap is exactly the asymmetry. Both come from *one* render, so dither or modelled noise cannot fake a channel difference. With a second plugin in B the pair stays: Linear (magnitude, phase, group delay, impulse) then shows four curves, *A L*, *A R*, *B L*, *B R* (or *A M*, *A S*, *B M*, *B S*) — by default the colour names the plugin, A yellow and B blue, and the second channel is dashed (L/R colours turn that round), and each legend chip switches its curve on its own. The plugins are measured one after the other, so Linear takes about twice as long. Harmonic, Dynamics and Scope keep to the first channel of each plugin (*A L*, *B L*); Live has no pair view.
- **M/S gets its own stimulus.** The normal one is identical on both channels, so its side is zero and an M/S equaliser would show an empty Side band. The M/S pair feeds the **left channel only**: with L = x and R = 0, Mid and Side both see x/2, both bands are excited in one pass and the output separates into exactly the two filters, the halved excitation divided back out.

> **Note:** In the M/S pair the two bands run 6 dB below the *Level* setting on every tab except Linear — the halved excitation is only divided back out there. That shifts the operating point of anything nonlinear.



Match

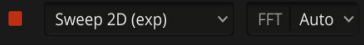
With a B chain loaded, *Match* answers "can plugin B copy plugin A?" automatically: it turns B's own knobs until the curves meet. You watch it live — the blue curve, the best candidate so far, crawls onto the yellow one while the status counts evaluations, the best RMS distance, the pace and the time left. The winner lands on the live B instance, followed by an A/B measurement with null figures. Above: the two curves at the start of a run. In one completed run, one vendor's three-band EQ matched a completely different vendor's EQ at −63 dB RMS distance.

Target	the frequency response — Match sits in the control row of *Linear → Magnitude*. For a minimum-phase plugin a matched magnitude brings phase, group delay and impulse along; a linear-phase plugin against a minimum-phase one can match the magnitude exactly and still differ in phase.
Parameters	listed under *Match tries to move these parameters of slot B*, with a short reminder of the tip below the heading. Tick which of B's parameters may move — frequency, gain, Q, and switches or choices of up to 12 named values, which Match tries one by one — or arm **Learn** and turn the knobs in B's editor: whatever moves gets ticked, and stays ticked. A row Learn ticks out of sight scrolls into view and lights up green for a moment; beside Learn a counter says how many are ticked — *7 of 140 ticked*. *Ticked only* lists just the ticked parameters: what gets ticked later joins the list, what you untick there stays until you switch it off. A search field above the list filters the parameters by name.
Band switches	pick a band's on/off switch (*Used*, *Enabled*, *Active*, *Bypass*, *Solo*) together with its frequency, gain or Q, and Match keeps the band on while it fits, switching off only at the end the bands that do not help. A band that was unused and ends up flat stays unused; *Solo* is never switched on. With the band's *Shape* or *Type* picked too, Match starts with a shelf where the target shows a shelf, and a bell where it shows a peak or dip.
Budget	*Auto* is 60 evaluations per ticked parameter plus a base, or type your own. A minimum, not a stop sign: the search goes on while a restart still improves the fit — until it is *done within* the next row.
Done within	0, 0.01 (the default), 0.05, 0.1 or 0.25 dB of mean RMS distance over the target: a fit that close ends the search at once. *0* never ends it early — the search spends its evaluations on the exact parameters, slowly.
Stop, Pause	*Stop* **keeps the best fit so far** — stopping when the curves are close enough is the normal way; only a stop before the first evaluation leaves B untouched. *Pause* holds until *Resume*.

The card re-opens with the previous selection, and a second run continues from the first result.

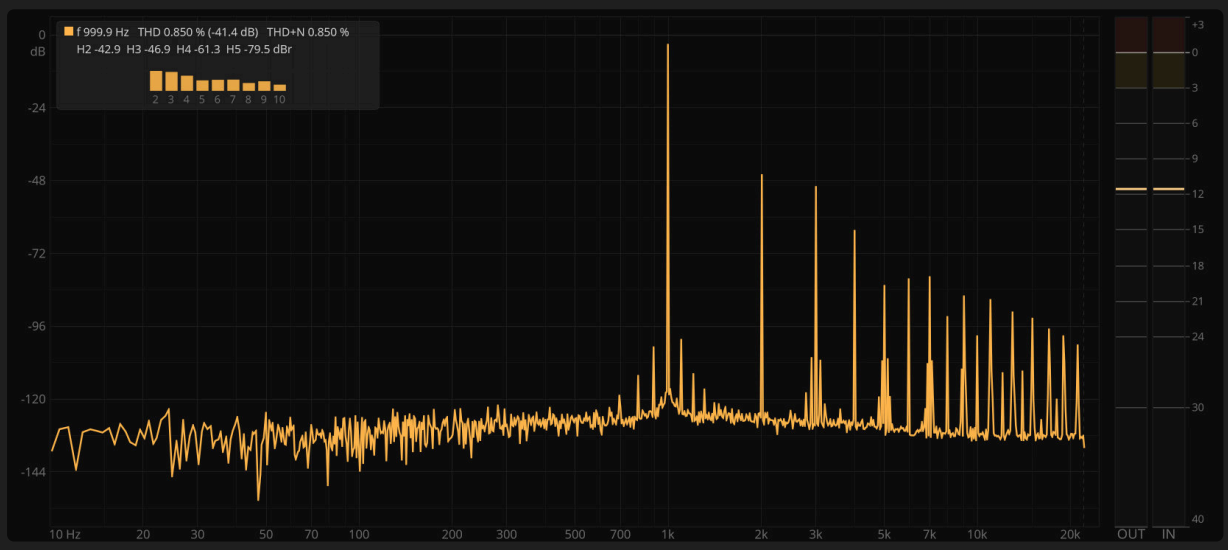
> **Tip:** Give Match a good starting point: set B up roughly like A first — as many bands switched on as A has features, each with the right shape (a shelf where A has a shelf, a bell where it has a peak or dip), and frequency, gain and Q about where A has them; the closer the start, the better the match. Then arm **Learn** and touch only frequency, gain and Q of those bands. An EQ without a shape to pick needs a shelf-shaped band to start from for a shelving target — a bell can settle in a wrong local optimum. And a nonlinear processor is matched on its small-signal response.

Harmonic



The mode combo selects the analysis. The tone modes, THD and IMD, run a fixed 64k window — a floor far below anything a plugin does and nothing that drifts between runs, which is what makes two THD figures comparable. The **FFT** combo belongs to the 2D sweep alone (2k..16k), and **Range** is its colour scale. **Hz** sets the tone frequency; tones snap to exact FFT bins, so they never leak.

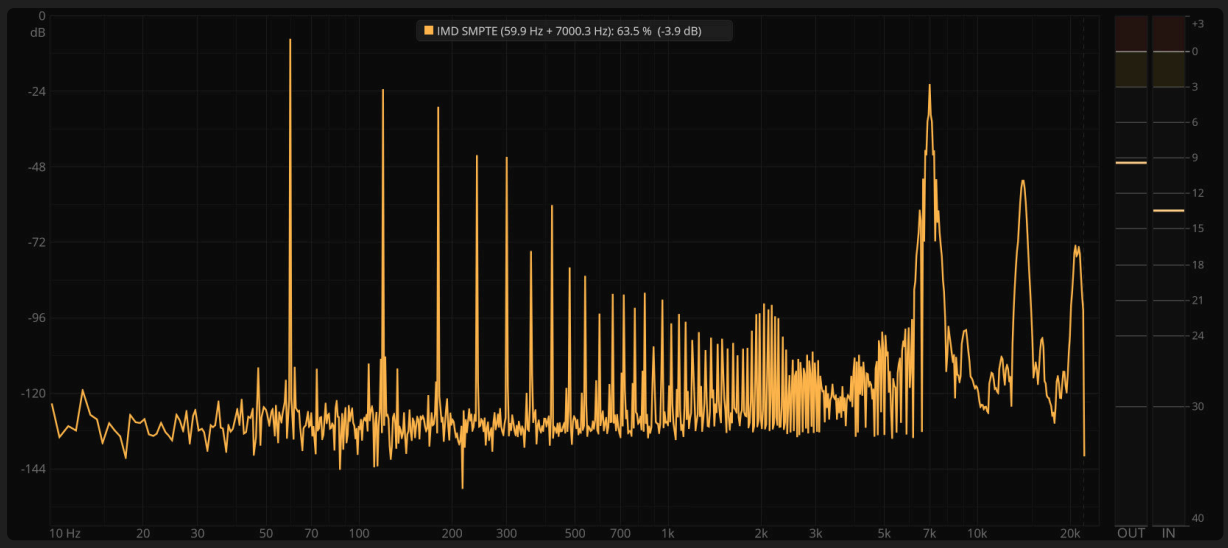
Noise line. A right click on the value axis (the dB numbers at the left) → *Noise line*: *Off* (the default), −80, −90, −100, −110, −120 dB or *Custom...* (−200 to 0 dB). A dashed grey line, labelled *Noise −90 dB* for instance, then runs across every Harmonic curve view — spectra, sweeps, Hammerstein, not the 2D sweeps — and shows at a glance whether a harmonic stands above that floor, say the −90 dBFS a real converter chain manages. It shows only while the level lies inside the value range (widen it in the same menu), zooms and pans with the plot, goes into images, and is kept with the analyzer settings, presets and sessions; Undo takes it back.



THD

The output spectrum of a bin-exact tone with THD and THD+N figures, and an **H2–H10 bar row** with each order's level relative to the fundamental. The example is a driven tube saturator: a cleanly stepped harmonic series over a −144 dB analysis floor. Sixteen coherent averages and a stimulus-difference method push that floor far below a plugin's own float noise — a bit-transparent plugin reads THD 0.0000 % at the −240 dB display floor. THD+N sums everything but the fundamental over 20 Hz to 20 kHz, the AES17 band. Right-click the dB axis to go down to −180 dB; below that a float32 plugin only shows its own quantisation.

Under the figures, the bar box names H2 to H5 in numbers, each relative to the fundamental — *H2 −53.4 H3 −57.0 H4 −109.4 H5 −78.3 dBr* — and B's line sits under B's. An order above 20 kHz is left out, so an 8 kHz tone lists H2 alone; one that sits in the noise floor reads *noise*.

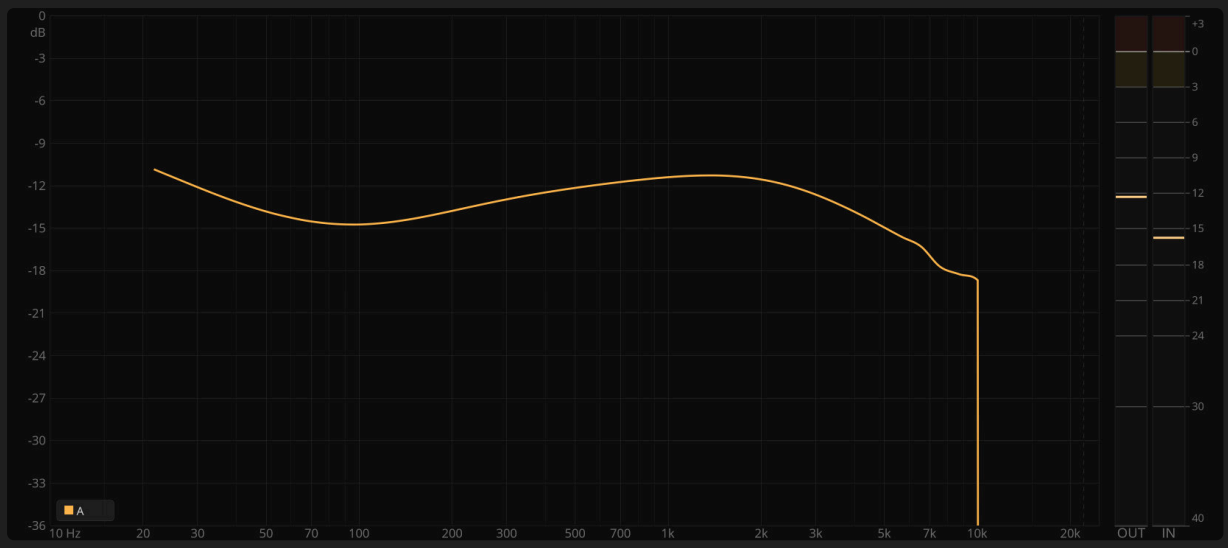


IMD

Two tones at once, because distortion that looks harmless as THD can still smear complex material — and a single tone cannot show it. A preset picks the pair, and the pair decides what you are reading:

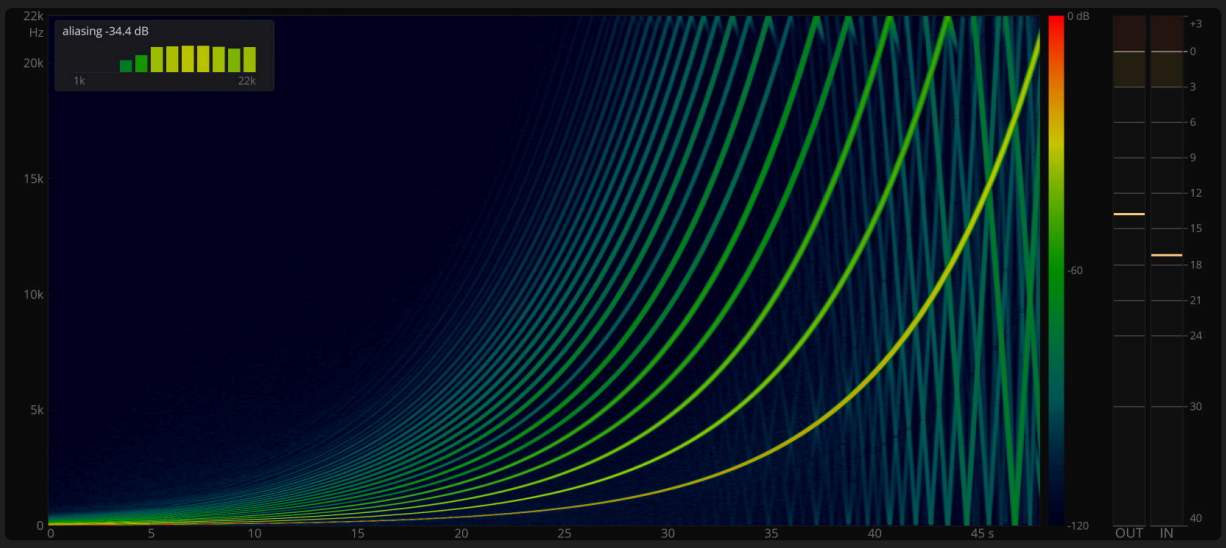
- **SMPTE 60 Hz + 7 kHz** and **DIN 250 Hz + 8 kHz** — a loud low tone and a quiet high one, mixed 4:1. Nonlinearity shows as harmonics of the low tone marching up the left half and as *sidebands* around the high tone at multiples of the low frequency; the figure sums the sideband energy against the high tone. [5]
- **CCIF 19 kHz + 20 kHz** — equal twin tones at the top of the band. The products land far *below* them: the difference product at 1 kHz and the third-order pair either side of the twins, mid-band where nothing else is playing. Read against the sum of both carriers, IEC style, it catches a converter or a saturator that behaves everywhere except at the top. [5]

The figure names the preset and the frequencies actually used.



Sweep: THD / Sweep: Fundamental

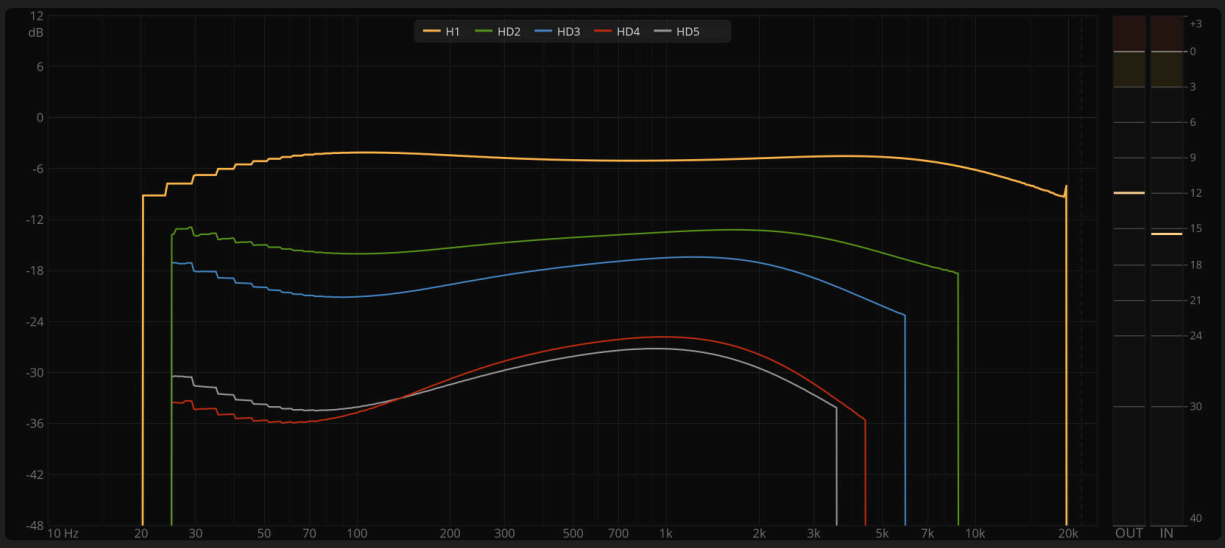
The tone measurement repeated across the band. *Sweep: THD* shows where in the spectrum a processor distorts — the saturator above is broadly even, with a little more bite through the mids, and dives to the −160 dB analysis floor where its harmonics leave the audio band. *Sweep: Fundamental* plots the fundamental's gain instead: the level response under a real tone, which for a nonlinear box need not match the small-signal Linear curve.



Sweep 2D (exp / lin)

A dense STFT spectrogram of a long sweep: time (= excitation frequency) on the x axis, frequency on y. Harmonics are curves above the ridge — the saturator above draws a whole fan — and *aliasing appears as lines reflecting off the top edge*, visible in the upper right where the harmonics fold back down. The two entries are two measurements with different test signals, not an axis setting: the exponential sweep curves the products; the linear sweep draws each as a straight line, which makes the geometry easy to read.

The **aliasing figure** is the folded-product energy relative to the sweep ridge, with a **histogram** of twelve log-spaced bands from 1 kHz to the sweep end, each bar in the heatmap colour of its level; where the bars rise, the plugin folds energy back into the band. Pull the *Range* floor up until the products stand clear of the noise bed.



Hammerstein H1–H5

Farina's swept-sine method separates the distortion *by order*: H1 is the linear response (yellow, absolute), HD2..HD5 are the relative 2nd..5th order distortion curves over the input frequency. This tells you not just *how much* a saturator distorts but *which orders* it produces where — above, the tube stage's 2nd and 3rd order sit ~24 dB under the fundamental with 4th and 5th well below. [1]

A and B. With a plugin in B as well, the legend carries an *A* switch beside *B*: A (solid) hides every order's A curve, B (dashed) every B curve. The order chips still switch both slots' curve of that order.

How to read the ends. The sweep runs from 20 Hz to 20 kHz, and H1 covers all of it. Each HDk is drawn from 25 Hz up to where its k-th harmonic reaches 90 % of the sweep's top — HD2 to 9 kHz, HD3 to 6 kHz, HD4 to 4.5 kHz, HD5 to 3.6 kHz, a little lower at 44.1 kHz, where the sweep stops at 19.85 kHz. Below 25 Hz the window that separates an order is too short and would draw wiggles; near the top it picks up the fundamental and would draw spikes. Both ends are the method's limit, not the plugin's.

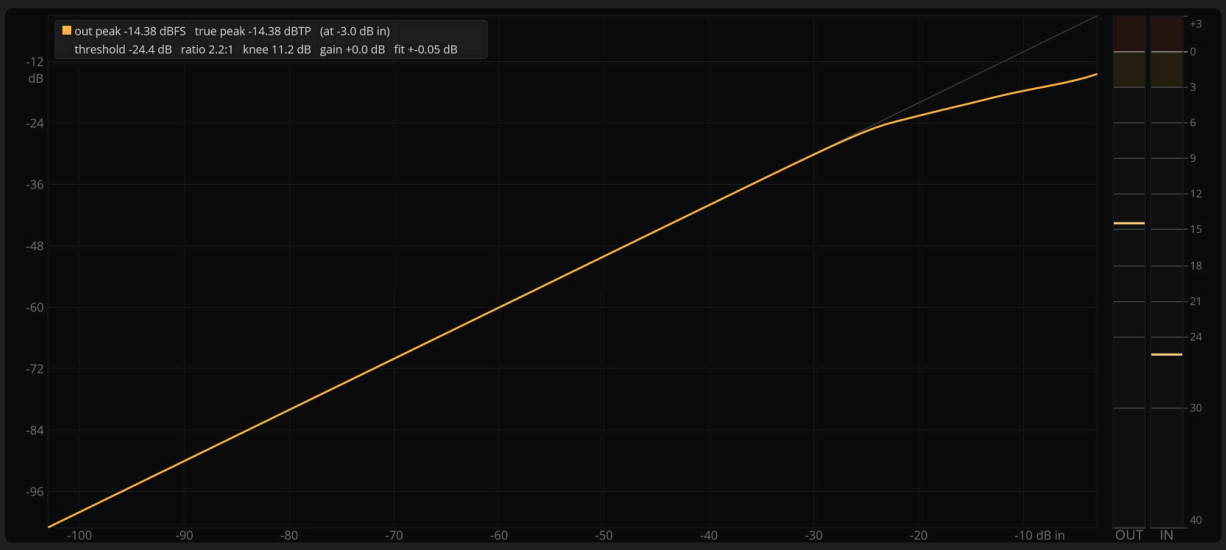
> **Note:** Hammerstein assumes a static nonlinearity. Time-variant processors (compressors, program-dependent release) smear modulation energy into pseudo-HD floors — read those with the 2D sweep instead.

Dynamics

Ramp

Ramp | Hz: 1000 Hz | From: -100 dB | Dwell: 0.40 s | Settled | Compensated

A sine stepped up in 1 dB steps to the *Level*, starting *From* dB below it (default −100 dB) — Level 0 gives a ramp to 0 dBFS, a higher Level runs past full scale — holding each level for *Dwell* seconds, drawn as the static in/out transfer curve against the unity diagonal. Compression, expansion, gating and knee shapes read directly — the mastering limiter in the plot below tracks unity to −26 dB, bends into its 2:1 compressor knee, and flattens toward the peak-limiter ceiling. The figures line reports sample peak and **true peak (dBTP, 4× sinc)** of the top step — the inter-sample-over check every limiter should pass. [4]



Axes and zoom. Input and output always span the same dB range, so the grey diagonal is true unity at any range or zoom, and both axes end at the ramp's real top, the Level, above 0 dBFS too. *Auto* (the default) frames the whole ramp plus any output beyond it, makeup above the top for instance, and ignores silent steps; toggling Auto off with **Alt+A** shows the full ramp. Right-click the Y axis to open the range menu. It offers the top 24 dB, the top 60 dB (and 100 dB on a longer ramp) and *Full ramp*. **Alt+Up** applies the previous value range directly and **Alt+Down** applies the next. Each range sets both axes. A double-click, *Reset zoom* or wheeling out returns to the whole ramp. The figures give the input level of the top step, *(at −3.0 dB in)* for instance. Steps more than 120 dB below full scale — From −120 at Level −18 reaches down to −138 dBFS — are digital silence and read −140.

Threshold, ratio, knee. Examer fits a soft-knee compressor plus a constant gain to the measured curve and prints it as a second, indented row under each curve's figures — B gets its own: *threshold −24.8 dB ratio 4.0:1 knee hard gain +6.0 dB fit ±0.00 dB*. [8] The same fit reads an expander or a gate below the knee (*ratio 1:2.0*, *1:≥ 20 (gate)*) and upward compression (*2.0:1 upward*); 20:1 and above reads ≥ *20:1*, and a knee narrower than the 1 dB step reads *hard*. Where numbers would mislead, the row says so instead: *no threshold*

in range with the gain alone when the curve never leaves unity, *one knee does not fit the curve* when the residual is over 0.5 dB RMS — two knees, or a plugin running into the end of its range — and *the knee is not inside the range* with where it lies.

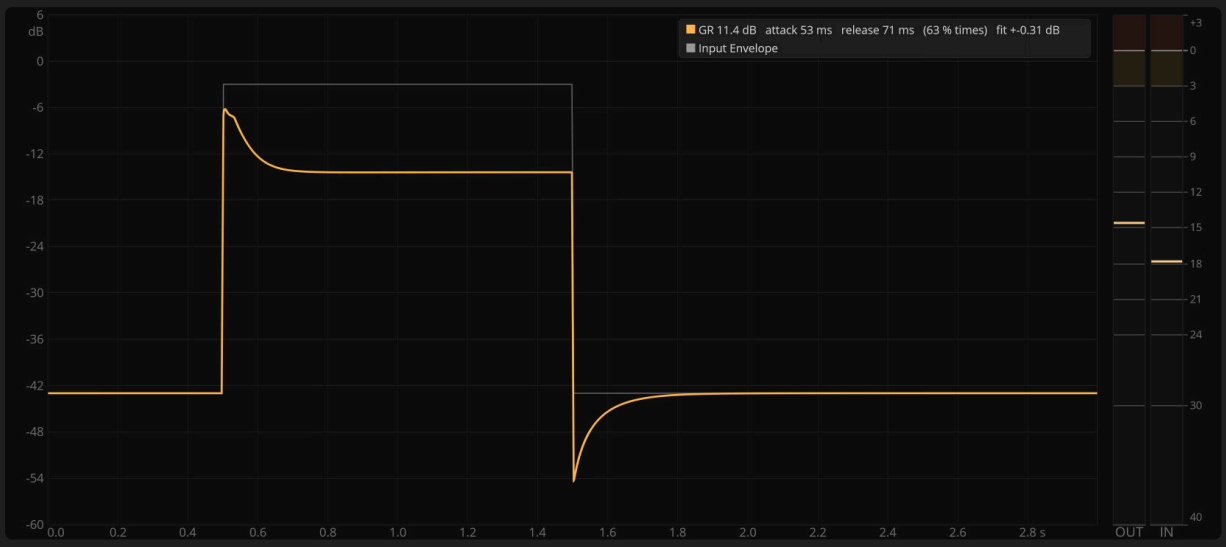
Compensated and Realtime. *Compensated* adds the makeup-compensated curve, dashed in each plugin's colour: the output minus the gain the fit found, so a compressor's curve lies on the unity diagonal below its knee and only the compression itself stands out; the legend says how much was taken off (*dashed: makeup-compensated, the fitted gain +6.0 dB taken off*). Without a gain from the fit there is no dashed curve, and a note says why. *Settled* / *Realtime* are two views of the same measurement — switching does not measure again. *Settled*, the default, draws one point per step once the plugin has settled: the static curve that threshold, ratio and knee are read from. *Realtime* also draws, thin, the output during each step: above a compressor's threshold every step starts with a small spike — the louder step briefly meets the gain reduction of the step before — and its height follows the ratio. Attack and release do not change these spikes, as time is not on this graph; Attack/Release measures them. Both only add to the view: the figures stay as they were.

> **Note:** The threshold is the *input* level of the knee's centre at the test tone, in dBFS peak — not necessarily the number on the plugin's dial. The test tone is a sine, and an RMS detector reads a sine 3 dB below its peak, so its knee shows about 3 dB above the threshold set; a peak detector bends at it. That is how the plugin responds, not an offset of the measurement — and why one compressor's detector modes show different knees. A 5 ms attack shifts it by about 1 dB at 1 kHz, and an EQ ahead of the detector moves it with frequency. Measured: Examer's own reference compressor lands within 0.1 dB of its settings; a widely used plugin compressor gets its ratio exact and its threshold within 0.7 dB in Peak mode, within 0.04 dB in RMS mode once the 3 dB of the sine are allowed for.

Attack/Release



A quiet–loud–quiet sequence (*Lo* level, *Hold* and *Tail* lengths) rendered as the output envelope over time, the input envelope dimmed behind it. The envelope follows the whole signal, not only the test tone's fundamental, so overshoot and settling stay visible — and it is drawn even when no times can be read. The envelope below shows the compressor overshooting as the loud step lands, settling into ~12 dB of gain reduction, then undershooting as the level drops.



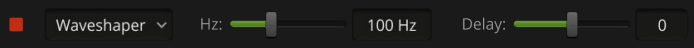
The **time-constant fit** prints GR depth, attack and release whenever the plugin actually reduced — not threshold crossings on a block grid, but an exponential fitted by weighted least squares to an envelope detected synchronously on the test tone. That buys a fourth figure, **fit ±x dB**: the residual, and the interesting one. The detector averages over whole periods of the test tone — 1 ms at 1 kHz, 50 ms at 20 Hz — so the shortest time constant it can resolve is one period of the tone; near that, the line says so. A device without a time constant — a saturator, a clipper, a gain that depends on level but does not move — reads *attack instant* and *release instant*, with the detector beside it: *(detector 1.00 ms at 1000 Hz)*. Even harmonics, a tube stage's for instance, do not pass for a slow attack.

What the times mean. Attack and release are time constants: the time from the level step until the gain reduction, in dB, has made 63 % of its change. The line says so — *GR 16.4 dB attack 6.8 ms release 62 ms (63 % times) fit ±0.67 dB*. A plugin's knob is a different thing: each plugin defines its own (10–90 %, a detector before or after the curve, extra level smoothing), so the two rarely agree, and a reading that differs from the knob is not a measuring error. A textbook one-pole compressor set to 10/100 ms reads 10.0/100.0 ms; the same widely used plugin compressor in Peak mode at the same 10/100 ms reads about 20/144 ms; the compressor in TDR Limiter 6 GE reads about 0.15× its knobs. All three are correct readings of what the plugins do.

How deep to compress. There is no one right amount of gain reduction for this measurement. Many designs change their times with depth — a program-dependent release, an opto cell, a vari-mu stage — so the same plugin can read different times at 3 dB and at 15 dB. To compare two compressors, set both to about the same gain reduction; that is why the figures print it right beside the times. Below 1 dB of gain reduction there is too little movement to time, and the line says so instead of giving times.

> **Tip:** A clean feed-forward design fits within a few hundredths of a dB. A residual of a whole dB says the envelope is not a single exponential at all — which is what "programme-dependent" looks like when you measure it.

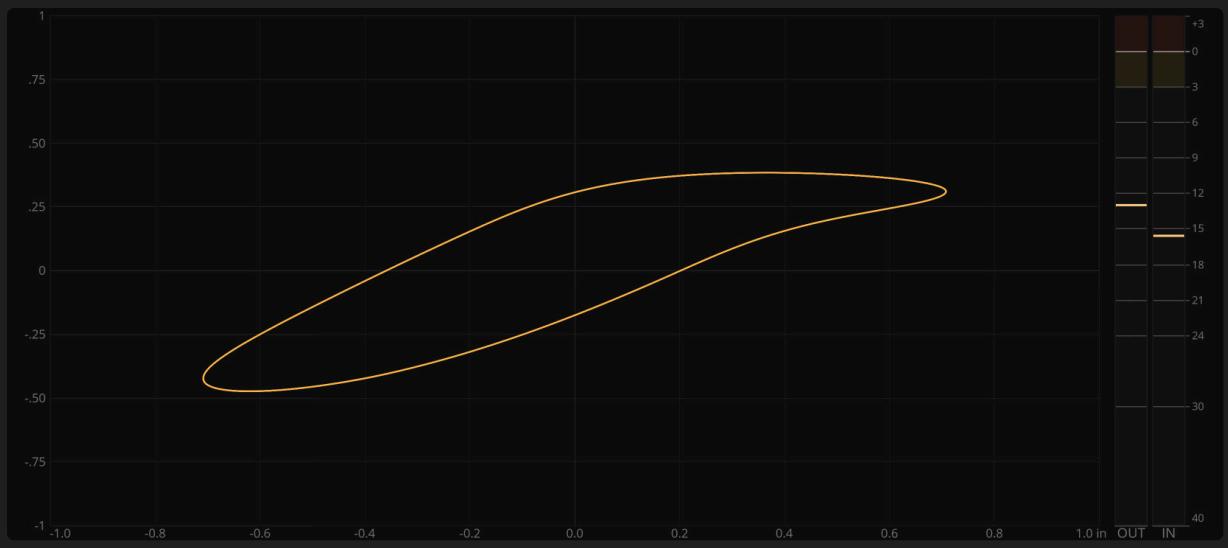
Scope



Cycles in the control row sets how many periods of the waveform the time axis shows — 1, 2, 4, 8 or 16, by default 4 — and is kept after a restart. The view dropdown beside it picks *Oscilloscope* or *Waveshaper*. The Waveshaper has axes of its own and hides *Cycles*.

Waveforms

Waveforms through the plugin, drawn with sinc reconstruction — the smooth curve a DAC would output, not connect-the-dots. Sine, Square, Saw and Triangle are built band-limited (alias-free by construction, over an exact integer period).



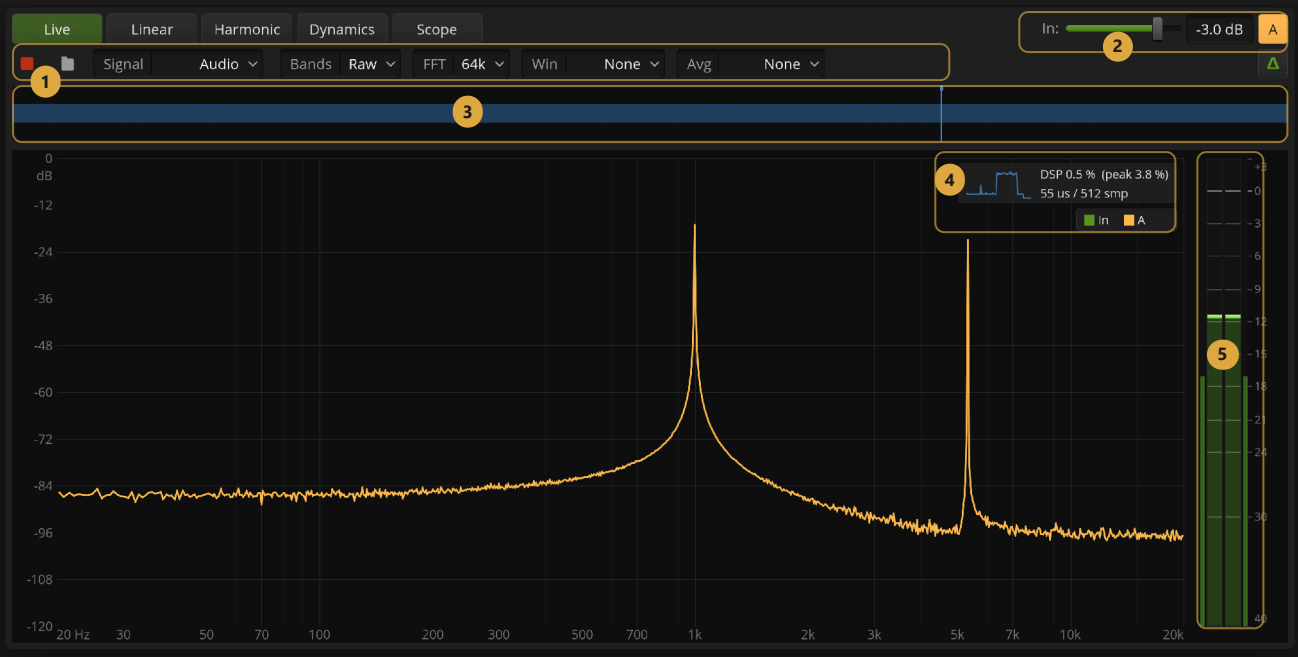
Waveshaper

Waveshaper in the view dropdown switches to the transfer view: output plotted against input for one sine cycle — the fingerprint of any waveshaping stage. The tube stage above shows both effects at once: the trace bends asymmetrically (compressing the positive half earlier than the negative — exactly where its even harmonics come from) and opens into a loop, the phase shift of its low-frequency filtering at the 100 Hz test tone. A linear, phase-flat plugin draws a straight line; the part of a loop that is plain delay collapses with the *Delay* control.

A bypassed slot passes its input unchanged. Its curve overlays the grey *In* curve with a dashed line labelled *A bypassed* or *B bypassed*.

Live

A real-time analyzer of the monitoring chain: the built-in generator or a loaded audio file plays through the plugin and out of your audio device.



1 Control row

- **Play / stop, open** — start and stop the source (**Space**); open an audio file — or drop one on the window.
- **Δ Delta** — hear what the plugin changes.
- **Signal** — *Audio* (the file) or the generator: *Sine*, *White* and *Pink noise*, *Impulse* at two a second so the response stays on screen. With the sine, **Bin** parks the tone on the nearest FFT bin centre so it reads as one line at its true level, not a skirt up to 1.4 dB low; the display shows the frequency produced — 1000 Hz becomes 1001.3 at 44.1 kHz with the 16k window.
- **Bands** — octave-band smoothing; *Raw* for the plain FFT bins.
- **FFT** — the analysis size, 16k unless you change it.
- **Win** — the window: Hann for general use, Blackman or Blackman-Harris for low sidelobes, flat top for exact tone levels. [3]
- **Avg** — the averaging: *None* unless you change it, a power average over 0.3, 1, 3 or 10 s, or *Since reset*; *Reset average* in the plot's context menu starts it again. The same choice sits in that menu and in the settings. The FFT window itself spans FFT size ÷ sample rate (16k at 48 kHz: 0.34 s) and comes on top of the averaging time, so a large FFT reacts slower than the average says. When the window is at least as long as Avg, its length stands in brackets beside the value — *(+1.4 s)* at 64k and 48 kHz.

2 In and A / B

- **In** — the input trim — what the plugin is *fed*, which decides whether it distorts. Each source keeps its own: −3 dB for audio and the sine, −20 dB for noise and impulses, which arrive far hotter. A new source fades in over a second; double-click resets.
- **A / B** — the slot you *hear* — see below.

3 Waveform — a locator for the file.

4 **DSP load and legend**

- **DSP load** — average and peak share of the buffer budget, the block time in µs and the last minute as a sparkline, so a spike leaves a trace.
- **In / A** — with a file and a plugin in A: **green is what goes in**, **yellow what comes out of A**, aligned by what the plugin *actually* delays — its reported latency plus what the linear measurement found on top. A legend like any other; hiding A here hides it on the measured tabs too.

5 **Meter** — the output, −40 to +3 dBFS — green to −3, yellow to 0, red above, fixed bands the bar reveals, so a peak's colour is its level — with a slim RMS strip beside each bar. Clip latch and right-click menu as on the measurement meter, plus the *RMS* menu: *Off*, a window of 100 ms, 300 ms (the default) or *1 s*, or *600 ms* — a 270 ms time constant on the RMS amplitude, so it rises in about 0.6 s and falls at 32 dB/s, still RMS in dBFS, so a sine reads 3 dB under its peak [10] — and a *Hold mark*, off by default, on the highest RMS reading, with the peak hold's time and release and cleared with the peaks. The bar is slowed so it does not flicker, the peak mark is exact.

A mono file feeds both channels.

Level range and zoom. Right-click the level axis — or the curve area, under *Range* — to choose the range: *0 .. -60 dB*, *0 .. -90 dB*, *0 .. -120 dB* (the default), *0 .. -150 dB* or *Custom...*, which asks for the upper and lower bound in dB. **Alt+Up** / **Alt+Down** step through the same list. Live has no *Auto*, so the scale never jumps while the music plays. The range is kept in the settings and in sessions. Zoom works as on the measurement tabs: the mouse wheel zooms around the pointer, dragging with the left button zooms to the rectangle, **Alt**+click goes one step back, and a double-click or *Reset zoom* in the context menu returns to the chosen range and 20 Hz to 20 kHz (Nyquist at low sample rates). The zoom is not saved: it stays while you switch tabs and resets when the device changes its sample rate.



What you hear. A click on the lit **A** or **B** is the true bypass: it drives the plugin's own bypass parameter where there is one, and follows that switch on its editor too; a plugin without one is taken out of the chain. Both keys are then unlit and you hear the input unprocessed; a click on A or B lights it again. Measurements are not affected. Both slots keep processing, so a switch — a 20 ms crossfade — compares two settled plugins; curve and DSP load follow the slot that plays.



Delta, the **Δ** key in the Live control row beside play and stop, plays what the plugin you hear *changes*: its output minus its input, latency-aligned. A plugin that does nothing gives silence; switching A and B with Delta on compares the two deltas. It is for listening only — the output meter and the Live curve show the delta, no measurement or Match sees it. It works while a slot holds a plugin, lights while it is on, is greyed while HW monitors the gear, and has no effect where a latency exceeds the 2-second alignment. Every start begins without it, and it has no shortcut. With neither A nor B lit, Delta shows

the monitored plugin's own bypass timing: silence only if its bypass is latency-compensated.

With the hardware loop running, **HW** puts the gear itself in the monitor path, so it can be heard on music; click it again for **raw**, the same signal untouched. The curves show green for the signal before it left and the slot colour for what came back. **Every monitor leg is delayed to the longest one, raw included** — a round trip through converters runs about 50 ms at 1024 samples and 44.1 kHz — so switching never moves the music in time. One measurement must have run since the loop went on, so the round trip is known; and raw is tapped inside the program, so through analogue converters their character is credited to the box. Level is yours to match — a device with makeup gain wins any comparison that does not correct for it.

Hardware

File → Set Hardware Loop (also in the A slot menu) sends the stimulus from your interface through the gear and back to an input. Connect an EQ, compressor or pedal, or use a loopback cable to measure the interface itself. A yellow **HW LOOP** stands in place of plugin A, and slot A may stay empty. Every measurement works on hardware.

HW LOOP | R: right channel

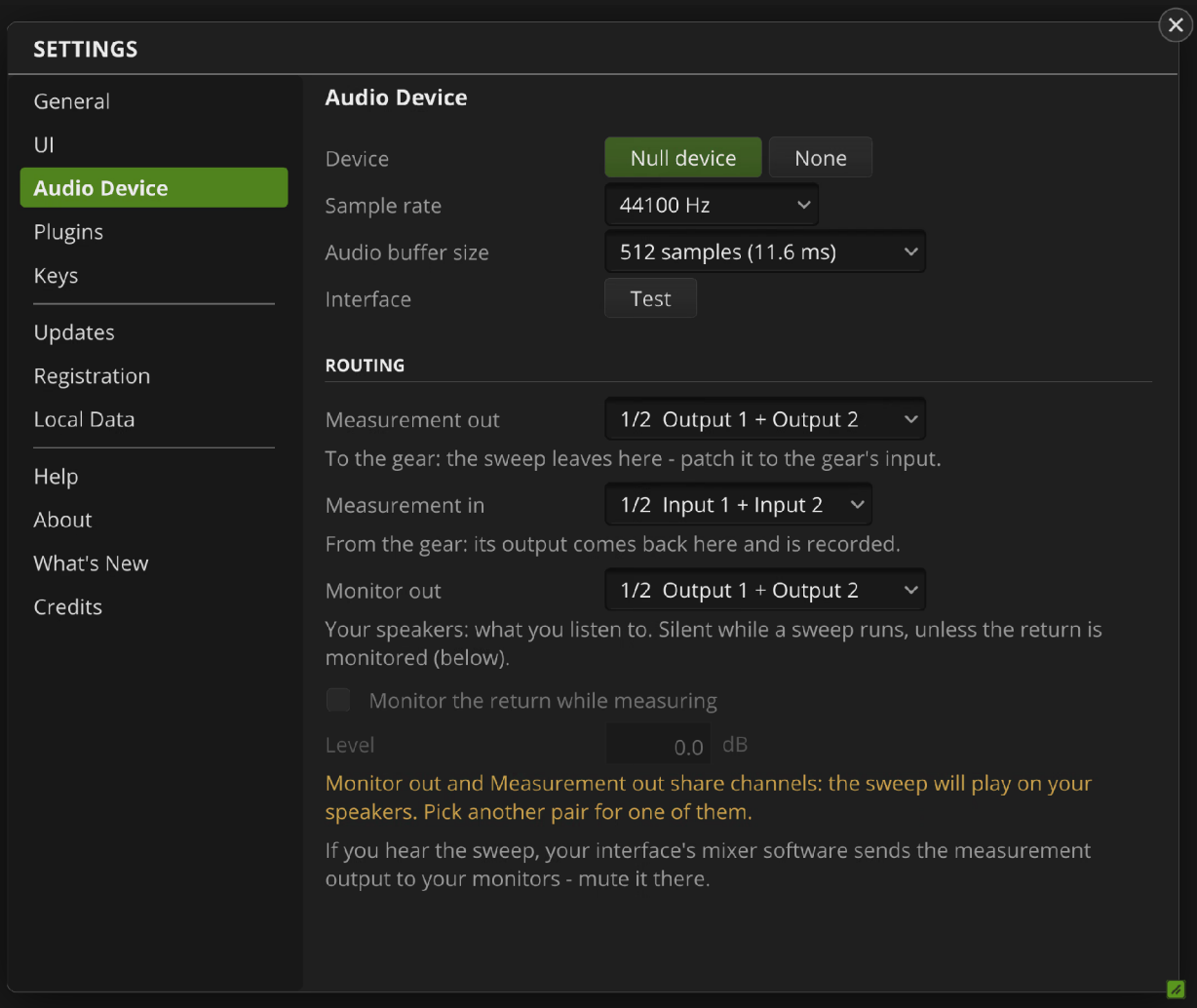
- **No calibration pass.** A short sync chirp ahead of every stimulus is found in the recording by cross-correlation and carries the whole round trip — buffers, converters and the gear. Measurements run at the device sample rate, and the stimulus is audible.
- **It measures continuously.** A knob on outboard gear announces nothing, so the capture repeats and the curve follows a few seconds behind. *Measure continuously* in the File menu and the A slot menu stops it while you re-patch — **single shot**. If no signal returns, the log says so and Examer waits for the next change.
- **Latency of the gear.** *Plugin info* (*Settings → Help*) shows the chirp's round trip in samples and ms, the driver's own input and output latency, and the difference — **In the loop**, measured rather than looked up. It is dropped when the loop, device, rate or buffer size changes; a dropout since the loop went on is flagged.
- **Level.** Examer measures how hard the path can be driven and holds its own output that far back, so **0 dB on the Level slider drives the path as hard as it takes cleanly** and every step below is headroom you spend. The calibration follows each clean capture, both ways, shown as a dimmed **AUTO −x.x dB** — normal running. The attenuation is taken back out of the result: exact while the device is linear, but a compressor or saturator was driven softer than the slider suggests. Beyond 36 dB of excess it gives up and says so — the gain inside the device has to come down. The **AUTO** key turns all this off when the level itself is the subject: the slider is then what leaves, and a clipped return is reported, not retreated from.
- **Against a plugin.** B stays a plugin and renders offline, so Linear compares the gear (yellow) with the plugin (blue), null figures between — and Match fits the plugin onto the hardware:

profile an outboard EQ once, then let a software EQ copy it.

- **Sweep or Noise** — Linear's *Method* with the loop on. **Sweep**, a single exponential sweep: the best signal-to-noise per second, harmonics outside the answer; longer is cleaner on a noisy device. [1] **Noise**, pink with Welch averaging: slower, and on a plain equaliser nothing new — it earns its place on anything *not* linear: a compressor fed a sweep rides one frequency at a time, broadband excitation measures it where it works. Frame size sets the resolution, each doubling of the averages takes about 3 dB out of the scatter. [2] A plugin is deterministic and always measured with the sweep — so with the loop on Noise, an A/B overlay sets the gear's noise measurement against B's sweep.
- **Hear the return.** *Monitor the return while measuring* on *Settings → Audio Device* feeds the return to the monitor pair — the one thing that tells you a cable is out before the curve does — with a *Level* trim applied after recording, so it never changes a reading.
- **Routing warnings.** *Settings → Audio Device → ROUTING* warns in yellow when *Monitor out* shares channels with *Measurement out* — the sweep would play on your speakers, and the status line says **SWEEP ON MONITOR**; on an interface with several output pairs, leaving everything on pair 1 does exactly that.

  MUTED | SWEEP ON MONITOR | 44.1 kHz | Mix.wav

  It warns when *Measurement in* is named a loopback, and when the return is an exact copy of the sweep, under −80 dB of difference: a loopback or a bit-transparent digital path instead of the gear, shown as **RETURN IS A LOOPBACK** and on the hardware info card. Two things it cannot see: a loopback whose channels carry ordinary names, and a feedback loop inside the interface's own mixer. So the tip under the warnings stays: *If you hear the sweep, your interface's mixer software sends the measurement output to your monitors - mute it there.*



> **Note:** A capture that clips *does not look broken*: the deconvolution smears the flat tops into a slightly noisy curve of roughly the right shape — plausible and wrong. Examer counts full-scale samples in every capture and lights a red **INPUT CLIPPED**. The fix is the *Level* slider, or the gain inside the loop.

Engine and Export

- **Offline and exact** — no audio device is involved: the plugin is fed block by block as fast as the CPU manages and a long sweep does not take its own duration. Stimuli and analysis are computed in double.
- **Settling** — each render opens with 0.25 s of silence so parameter smoothing and internal ramps settle; otherwise you would measure the plugin *arriving* at its setting. It is why two runs of the same knob position agree.
- **64-bit hosting** — a plugin that offers a double-precision pipeline (*Plugin info* shows "64-bit") runs in double and gets the stimulus unquantised; otherwise the conversion happens once, at the plugin boundary.
- **Measurement sample rate** — *Settings → General → Measurement sample rate* runs the offline chain at 44.1..192 kHz regardless of the audio device.
- **Measurement engine** — in *Settings → General*, choose *In the Examer* (default) or *Each plugin in its own process*. Both give the same results. The latter starts a background process when

you load the plugin. The first measurement may take longer while the status reads *starting measurement process…*. If the plugin crashes or hangs during measurement, Examer reports an error and stays open. The next measurement restarts the process.

Two groups always run separately: plugins on the list fetched with the update check (the built-in list applies without it), and plugins that previously crashed Examer on this computer during measurement preparation. *Learned plugins* shows the local count in brackets. *Clear learned plugins* forgets those records.

- **Stereo** — slot A and slot B run in stereo. A plugin that needs more than two channels still loads and is measured on L and R; the *Channels* line in *Plugin info* then ends in *measured on L/R*. Only a plugin whose L and R cannot be told apart is refused, with the message *L/R layout not supported*.
- **Deterministic** — fixed seeds, and nothing tied to wall-clock timing or device callbacks: the same settings give *bit-identical* output.
- **Late-reported latency** — the reported latency is re-read until the first output sample arrives, because overlap-add and FFT plugins often report their true latency only once processing has begun; a single early read would shift every curve by a phase error that looks like the plugin's own.

Export

Export. Save the measured view as PNG from File or the plot menu. The latter also copies the same image to the clipboard. See the plot menu for image dimensions and availability.

Command line. `"Examer.exe" "<plugin>" [options]` — one desktop shortcut opens your plugin, loads your test mix and plays. On macOS (`Examer.app/Contents/MacOS/Examer`) and Linux (`./Examer`) only the path to the binary differs. A plugin or audio file that does not exist is skipped without a message; an option Examer does not know ends the start with a usage line and exit code 2.

When Examer is already running, a start with just a plugin — and at most `--plugin-name` , `--audio` , `--play` and `--preset` — hands it over: the running Examer loads it into slot A and comes to the front, and the new call ends at once with exit code 0. It goes only to the same program with the same settings folder; if none answers within about two seconds, a new window opens as usual. Any other option starts an Examer of its own, and `--new-window` always does.

Option	What it does
`"<plugin>"`	loads the plugin into slot A — a `.vst3`, a VST2 `.dll`, `.vst` or `.so`, an Audio Unit `.component`.
`--plugin-name "<name>"`	which plugin of a file that holds several — a shell file, a VST3 or Audio Unit with several plugins: its name in any case; a part is enough when only one name contains it. Without it Examer shows the plugin chooser.
`--audio "<file>"`	loads the audio file into the Live tab's player.
`--play`	starts playback once plugin and audio file are ready.
`--preset "<name>"`	loads an analyzer preset — tab, mode, level — by its exact name, upper and lower case as saved. Not the plugin's own presets.
`--session "<file>"`	opens a saved session (`.examer`): plugins A and B with their states, the analyzer setup and the audio file.
`--new-window`	opens an Examer of its own even when one is running, instead of handing the plugin over.
`--mute`	sends nothing to the audio device; everything else runs, meters and measures.
`--null-audio`	no sound card at all — a device without hardware clocks the audio and no driver is loaded; for a machine without audio, or one whose driver you want to rule out. `--null-block` 64, 128, 256, 512, 1024 or 2048 (else 512) and `--null-rate` 44100 to 192000 (else 48000) set its block size and sample rate.
`--no-update-check`	no update check this run; the setting stays as it is. Or set the environment variable `OD_EXAMER_NO_UPDATE_CHECK` (any value but `0`).
`--settings-dir "<dir>"`	keeps settings, presets, log and crash reports in that folder for this run instead of the usual one — two versions side by side, or a folder you cannot write to; it is made if missing. Or `OD_EXAMER_SETTINGS_DIR` with an absolute path. A folder it cannot use ends the start with exit code 8.
`--console`	Windows: writes the log into the console you started Examer from (a normal start never does).

Three options answer and exit, without a window:

- `--version` — the version, plus the versions of the file formats and measurement methods; exit code 0.
- `--check-key "<file.tdr>"` — says whether a key file is valid for Examer; installs nothing. Exit code 0 when valid, 3 when not.
- `--licence "<key text or path to .tdr>"` — installs the key, as *Settings* → *Registration* does, and prints whom it is licensed to. Exit code 0, or 3 when the key is refused. With further options the run goes on, under that key.

System Requirements

- **Windows** 10 or later (64 bit), **macOS** 10.13 or later (universal — Apple Silicon and Intel), or **Linux** (x86_64, glibc 2.35 or later — for example Ubuntu 22.04, Debian 12 or Fedora 36 and later).
- Plugins under test: **VST3** on all three, plus VST2 (`.dll`) on Windows, VST2 (`.vst`) and Audio Unit (`.component`) on macOS, and VST2 (`.so`) on Linux.
- **Installing** — on Windows a signed setup asks for the *Installation type*: *Standard* puts Examer into `Program Files\Tokyo Dawn Labs\Examer` — an update of an earlier install stays in its folder — with a Start-menu entry, a desktop icon if you want one and an entry in *Apps & Features*, which removes it again, your settings and the licence kept; *Portable* installs into a folder you choose (`%USERPROFILE%\OD Examer Portable` is suggested, not Program Files) and keeps settings, presets and log beside *Examer.exe* — to remove it, delete that folder. A setup you start by hand suggests the type and folder last chosen in its window, so it needs only *Next*; an update started from Examer suggests the copy it was started from (Updates). Either closes a running Examer before replacing it. The TDR Collector manages the Standard installation only: it runs the setup silently, always installs *Standard* and does not list or update a portable copy. Installing Examer through the Collector adds a separate Standard installation with its own settings and presets — the licence key serves both — and leaves the type a hand-started setup suggests alone. For *Portable*, download the setup directly. Unattended: `/INSTALLTYPE=standard` or `portable` , `/DIR="<folder>"` . On macOS a signed, notarised disk image — drag *Examer.app* onto *Applications*. On Linux an archive with an install script: `./install.sh` installs for your user, without root — the program into `~/.local/share/Tokyo Dawn Labs/Examer` and an entry into the application menu; `./install.sh "<folder>"` takes another folder, and the TDR Collector installs the same way. An update is the new archive's `./install.sh` , your settings and key kept; `uninstall.sh` in the installed folder removes the program and its menu entry. Or keep it portable — unpack it anywhere you can write to and start `./Examer` .
- **Settings** — an installed Examer keeps its window, session, log and analyzer presets beside your other Tokyo Dawn data (`%APPDATA%\Tokyo Dawn Labs\Examer` , `~/Library/Tokyo Dawn Labs/Examer` , `~/.config/Tokyo Dawn Labs/Examer`), a portable one beside the program; an earlier version's folder (`OD Examer`) is moved there once at the first start; *Settings → Local Data → Show* opens it, and *Export Zip...* there takes settings and presets to another machine. The licence key stays with your other TDR keys.
- An audio device is only needed for the Live tab and the hardware loop; every plugin measurement runs offline.

Updates & licence. Examer checks for a new version once a day (*Settings → Updates*: *Check now* any time, *Check for updates on start* to switch it off, or for one run `--no-update-check`); nothing installs itself — its card offers *Download*, *Later* and *Skip this version*; the download is checked against its SHA-256, then Examer starts the setup, or opens the disk image on a Mac — drag *Examer.app* onto *Applications* again. On Windows the setup stays visible, with the type and folder of the copy you started the update from already chosen, so it updates that very copy — portable

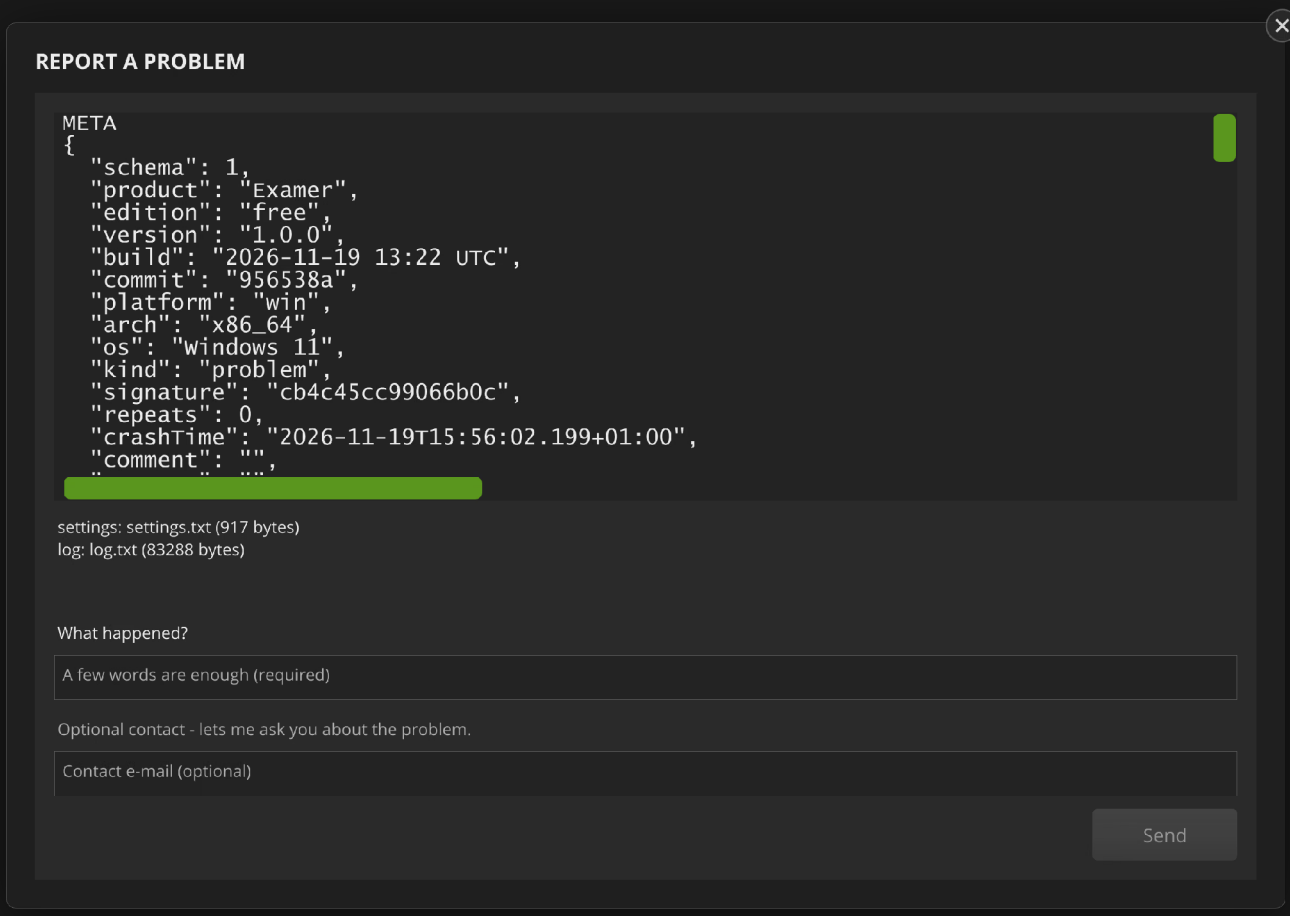
or Standard — and no other one on the computer; only a copy directly in a drive root (`D:\`) gets the type and folder last chosen in the setup's window, as the setup cannot install into a root. On Linux Examer shows the downloaded archive itself in your file manager, for every copy: unpack it and run its `./install.sh` to replace an installed copy — key, settings and presets kept — or unpack it over a portable copy's folder. When the server sends no checksum, the card installs nothing and offers *Open download page* instead. The check is a single anonymous request — no account, no telemetry. The licence key is personal, verified offline and shown on *Settings → Registration*.

Crash reports. If Examer crashed, or did not close normally, it says so at the next start — *Examer crashed last time.* — with *Send report*, *What is sent?* and *Show*. If it crashed again the same way and that crash has already been reported, it says so with the report's ID, and there is nothing to send. A crash you dismissed without sending is offered once more if it happens again, then no longer. Nothing is sent without that click, and there is no "always send". *Send report* shows exactly what would go: the report, the last 2000 lines of the log and, on a Mac, the system's crash report — your user name and computer name are not in it. On Windows *Include memory dump* adds the crash's memory dump; it is off, because a dump can hold anything that was in memory. *What were you doing?* and a *Contact e-mail* are optional and let us ask you about it. Until you enter an address yourself, the field starts with the one your licence key was issued to, if your key carries one — change it or clear it, and a cleared field stays empty; the address is remembered on this computer only and goes out only with *Send*. After *Send* the notice shows the report's ID — *Copy ID* puts it on the clipboard for a mail or the forum. A report that cannot go out waits and is tried again at the next starts, for up to 30 days. The reports go to our own server; what happens with them is in the privacy policy.

Hangs and memory. When Examer does not respond for 8 seconds it takes note. If it recovers within 30 seconds, that only goes into the log; if it stays stuck longer, the next start offers a report — *Examer stopped responding last time.* — that names the action that was running, and taking the snapshot for it does not hold Examer up. When its memory passes half of the computer's RAM, or grows very fast, Examer warns; near three quarters it stops the running measurement, unloads the plugin that keeps growing, says so in the window, and the next start offers *Examer used too much memory last time.* The log keeps a short memory curve and what each slot action — load, unload, editor, reload — cost, so the report shows which plugin grew and when. Both work like a crash report: nothing is sent without your click. The log window keeps only its newest lines, about 32 KB of text; the whole run stays in `lastrun.log` in the settings folder.

Report a problem. For anything that is not a crash — no sound, a plugin window that looks wrong — *Settings → Help → Report a problem...* (or a right-click on the **?** in the top bar) opens the same card as a crash report. *What happened?* is required, the *Contact e-mail* optional, filled in from your licence key like a crash report's and remembered on this computer. The preview shows everything that would be sent: the report's details (product, version, platform — no names), the

last 2000 lines of this run's log, and *Audio & playback* — the saved and the opened devices, sample rate, buffer, active channels, monitor on or off and its level, mute, the source, the hardware loop, UI scale, version and operating system, with no paths and no file names — and *Plugin editors*, the size and position of the open plugin windows. Nothing goes out until you click *Send*; then the card shows the report's ID.



Shortcuts

For these default shortcuts, use `Cmd` in place of `Ctrl` and `Option` in place of `Alt` on macOS.

Sessions and window

- New session — `Ctrl+N`
- Open session — `Ctrl+O`
- Save session — `Ctrl+S`
- Save As — `Ctrl+Shift+S`
- Undo — `Ctrl+Z`
- Redo — `Ctrl+Shift+Z` or `Ctrl+Y`
- Load audio — `Ctrl+Shift+O`
- Export an image — `Ctrl+Shift+E`
- Full screen — `F11`

- Zoom in / out on any tab — `Ctrl++` / `Ctrl+-` (`Ctrl+=` and the keypad work too)
- Settings — `Ctrl+,`
- Help — `F1`, on macOS `Cmd+?` (`Cmd+Shift+/`)
- Quit — `Ctrl+Q`

Plugins

- Search slot A / B — `Ctrl+F` / `Ctrl+Shift+F`
- Choose a plugin in search or in a file containing several plugins — `arrow keys`, then `Enter` to load
- Close either list, cancel a plugin drop or close Plugin Info — `Esc`
- Show or hide editor A / B — `Alt+E` / `Alt+B`

Tabs, modes and transport

- Switch tabs — `Alt+1` Live, `Alt+2` Linear, `Alt+3` Harmonic, `Alt+4` Dynamics, `Alt+5` Scope
- Previous mode / Next mode on any tab except Live — `Alt+Left` / `Alt+Right`
- Linear modes — `Alt+M` Magnitude, `Alt+P` Phase, `Alt+G` Group Delay, `Alt+I` Impulse
- Harmonic modes — `Alt+T` THD, `Alt+D` IMD
- Start / stop transport — `Space` plays or stops the source on Live and starts or stops the measurement on the measurement tabs

Plots and key assignments

- Free crosshair over a curve — hold `Alt` (`Option`)
- Fit value range (visible x span, except on Live and in 2D views) — `Alt+F`
- Auto value range (toggle Auto in any view with a value range) — `Alt+A`
- Previous value range / Next value range — `Alt+Up` / `Alt+Down`
- While assigning a key, cancel with `Esc` or clear with `Delete` or `Backspace`

Acknowledgements

Examer was conceived and developed by Jan Ohlhorst.

Software evaluation by:

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References

Examer does not invent its measurements. Where a reading follows a published method or a standard, this is the source - so a figure can be checked against something other than our word for it.

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