AuralHealer v1.0.3 User Guide

AuralHealer — User Guide

Version 1.0.3 · Audio Repair & Restoration plugin · Windows x64 · VST3 + CLAP



AuralHealer v1.0.3, overview (FREQ view)

AuralHealer v1.0.3 processing a full song. All screenshots in this guide are from v1.0.3.

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1. What AuralHealer is

AuralHealer
is an automatic audio repair and restoration plugin. You put it on a track, usually a **whole mixed song**, and it listens all the time. It finds and fixes common problems without a “learn” step, presets or setup:

Section	What it fixes
01 · Frequency Healing	Tonal balance: harsh, piercing peaks (2–8 kHz), boxy low-mid “mud”, dull top end, while keeping the loudness the same.
02 · Defect Healing	Clicks, pops and crackle, mains hum (50/60 Hz and harmonics), and steady static or hiss.

Section	What it fixes
03 · HF Restoration	High frequencies cut off by MP3/AAC encoding, AI generation or a low-pass filter. It rebuilds the missing top end, up to 20 kHz.
RESTORE (top bar)	Gives back tone and loudness that the repairs took away, and removes leftover digital artifacts (REMOVE ARTIFACTS).

The signal flows through the plugin in this order:

```
input → Defect Healing → Frequency Healing → RESTORE artifact cleanup → HF Restoration → output
```

Every section only changes the sound where it finds a problem. A clean, full-band master passes through almost unchanged.

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2. The interface at a glance

The window is a fixed 1200 × 700 pixels. It has three areas:

1. **Top bar**: logo and version, analysis status, REMOVE ARTIFACTS readout, TONE / LEVEL readout, **RESTORE** and **BYPASS** buttons, output peak meter.
2. **Signal Monitor**: a large live display of the waveform, spectrum and EQ curve, or a zoomed HF view.
3. **Three section panels**: Frequency Healing, Defect Healing and HF Restoration, each with its own ON/OFF button, a mini display, four sliders and a status footer.

   Tooltips: hover over any button or labelled readout for a short explanation. A tooltip appears after about half a second and stays visible for 12 seconds. It hides when you click or move away. Sliders have no tooltips.

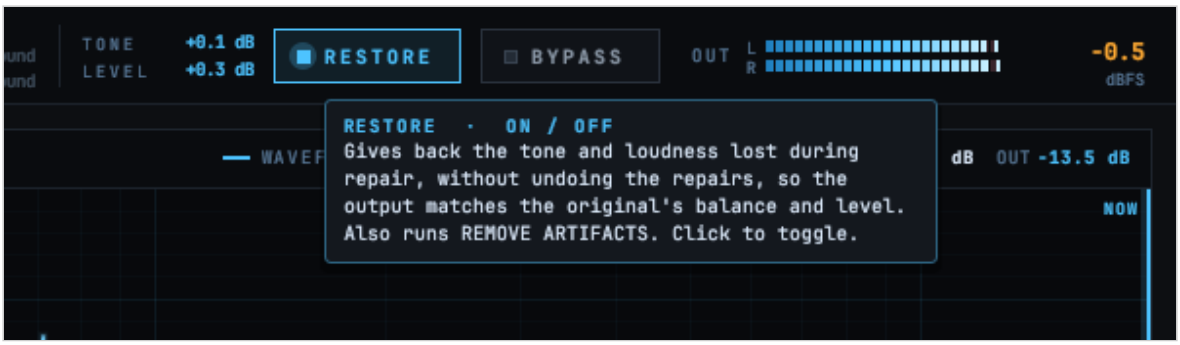


Tooltip example: AUTO-ANALYSIS

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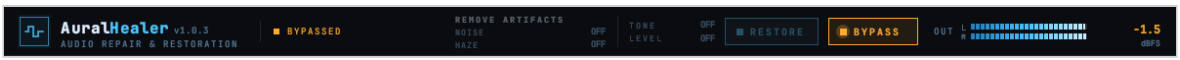
3. Top bar

Element	What it shows / does
AuralHealer v1.0.3	Logo and the installed version.
AUTO-ANALYSIS ACTIVE	Analysis is always on. The plugin keeps tracking the tonal balance, defects and high-frequency cutoff, and adapts as the music plays. While the plugin is bypassed, this label reads **BYPASSED** (amber).
REMOVE ARTIFACTS	What the automatic artifact cleaner (part of RESTORE) is removing right now. **NOISE**: faint steady “grid” tones or comb ripple, for example `7 cut · -12 dB`. **HAZE**: fake “mirror” highs from a badly upsampled file, for example `Above 11 kHz`. `None found` is the normal case for good files. `OFF` means RESTORE or the plugin is bypassed.
TONE	How much high-frequency brightness (above about 3 kHz) RESTORE is giving back, in dB.
LEVEL	The make-up gain RESTORE is applying so the output loudness matches the input, in dB.
RESTORE	On by default. Gives back the tone and level lost during repair without bringing back the noise that was removed. Also runs REMOVE ARTIFACTS. Click it to hear the plain repaired sound.
BYPASS	Passes the original audio through unprocessed, for instant A/B comparison. All settings are kept.
OUT L / R · dBFS	Output peak meters and the highest recent peak (held for 1.5 s). The number turns amber above −3 dBFS and red at −0.1 dBFS (clipping point).



RESTORE tooltip

Bypassed state. BYPASS lights amber, the status reads BYPASSED, and the RESTORE button and readouts dim:



Top bar while bypassed

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4. Signal Monitor

The tabs next to **SIGNAL MONITOR** switch the view. They do not switch sections on or off; each section has its own ON button. The small square in each tab lights when that section is active.

FREQ and DEFECT views

Both views show the same live display:

Layer (click its legend item to show or hide it)	**Meaning**
WAVEFORM	The last ~100 ms of the output signal. The blue **NOW** line marks the newest sample. Up/down is level (0 dB at top and bottom, −inf in the middle).
EQ CURVE (dashed)	The correction Frequency Healing is applying right now. Below the center line is a cut, above is a boost.
SPECTRUM (filled)	The output frequency spectrum.

The scale under the display is a **frequency scale, 20 Hz to 20 kHz** (logarithmic, like a standard EQ). It applies to the spectrum and the EQ curve. When Defect Healing repairs something inside the visible window, a dashed amber **CLICK**, **CRACKLE** or **STATIC** marker appears on the waveform.

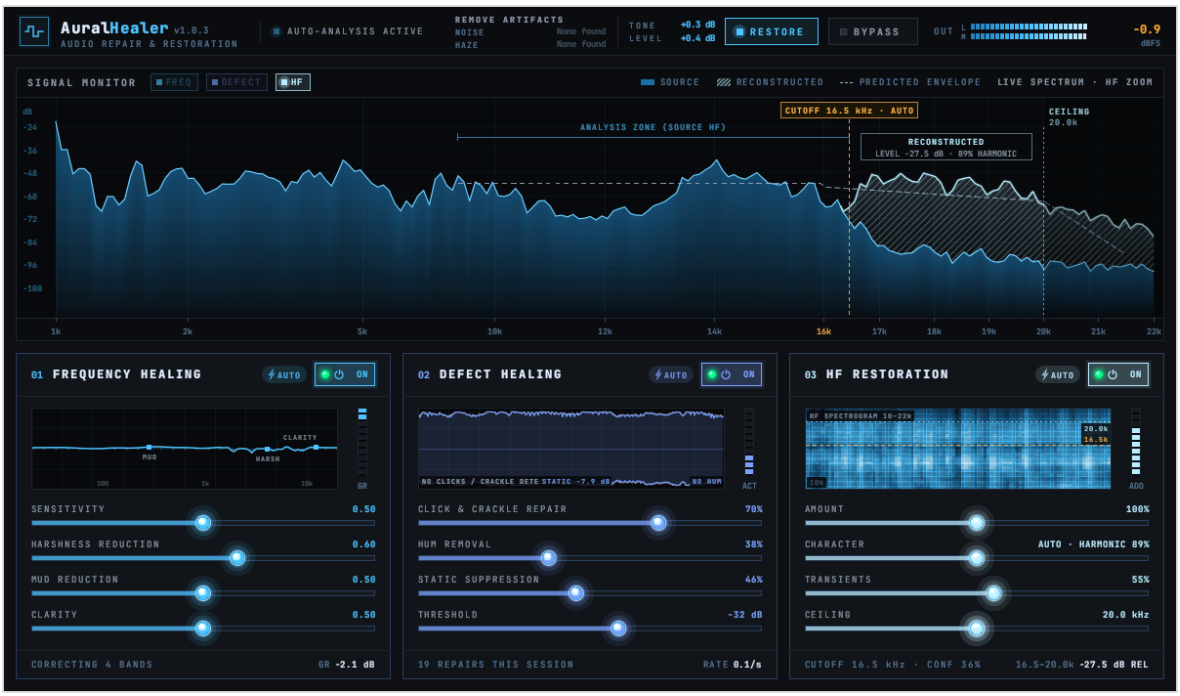
RMS IN / OUT (top right) shows the average level of the input and output in dB. Compare the two to see how the processing changes the loudness.



DEFECT view

HF view

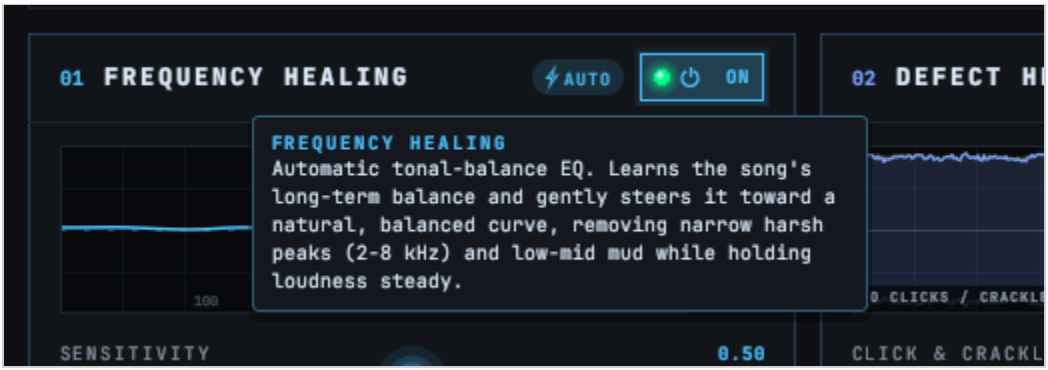
The HF view zooms in on the top of the spectrum to show what HF Restoration is doing: the source spectrum, the rebuilt band (hatched), the predicted natural roll-off (dashed), the analysis zone it learns from, and the **CUTOFF** and **CEILING** markers. A status message tells you what it is doing: **ANALYZING** (listening), **FULL-BAND** (nothing to rebuild), **NO ROOM** (cutoff already above the ceiling) or **OFF**.



HF view

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5. Section 01 — Frequency Healing



Section title tooltip

Automatic tonal-balance EQ. It learns the song’s long-term balance over a few seconds and gently steers it toward a natural, balanced curve. It removes narrow harsh peaks and low-mid mud, and holds the loudness steady.

Control	What it does
ON / OFF	Turns the section on or off (click-free crossfade).
SENSITIVITY	How strongly the automatic tonal correction acts (0 = gentle, 1 = strong).
HARSHNESS REDUCTION	

Control	What it does
	Tames harsh, piercing resonances between 2 and 8 kHz with narrow cuts, up to about 8 dB at 1.00.
MUD REDUCTION	Reduces boxy build-up between 200 and 400 Hz when the low-mids are too dense.
CLARITY	High-shelf “air” above 8 kHz. 0.50 = neutral, 1.00 = +3 dB.

Display: the mini curve shows the correction applied right now, with MUD, HARSH and CLARITY markers. **GR** shows the largest cut currently applied. The footer summarizes the current correction.

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6. Section 02 — Defect Healing

Fully automatic repair with no “learn noise” step. It works on whole mixes, not only on isolated tracks.

Control	What it does
ON / OFF	Turns the section on or off (click-free crossfade).
CLICK & CRACKLE REPAIR	Finds clicks, pops and dense streams of small crackle impulses (vinyl, digital or electrical crackle, mouth clicks) anywhere in the mix. It rebuilds the damaged samples from the surrounding audio and protects drum hits. A rebuild is only kept if it clearly explains the defect.
HUM REMOVAL	Finds and locks onto mains hum (50 or 60 Hz, including drifting hum) and removes it and its harmonics with very narrow notches. 0 = off.
STATIC SUPPRESSION	Removes steady background static or hiss. It tracks the noise continuously, keeps musical partials intact and uses hearing-based masking, so it removes no more than needed. 0 = off.
THRESHOLD	How loud a defect must be before it is treated. Lower (e.g. −50 dB) catches smaller defects; higher (e.g. −20 dB) treats only obvious ones.

Display: the mini display shows the signal envelope. Amber marks show repairs, and the faint amber outline shows what was removed. Labels show the repair count, the current static reduction and the hum status. **ACT** shows how much repair work is happening now. The footer shows repairs this session and the repair rate.

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7. Section 03 — HF Restoration

Fully automatic. It finds where the highs of the source stop (the “cutoff”, e.g. ~16 kHz for a 128 kbps MP3) and rebuilds the missing band above it, up to the ceiling. The new highs are generated from the music just below the cutoff, follow its rhythm and level, and fade in smoothly. On full-band material it stays out of the way.

Control	What it does
ON / OFF	Turns the section on or off (click-free).
AMOUNT	How loud the rebuilt band is. 100% matches the predicted natural roll-off of the track.
CHARACTER	AUTO picks the mix itself (shown as AIR % or HARMONIC %). Left = more harmonic (tonal), right = more air (noisy sparkle for cymbals and breath).
TRANSIENTS	How strongly the rebuilt highs follow drum hits and attacks.
CEILING	Highest frequency that is rebuilt (18–22 kHz, default 20 kHz).

Display: a scrolling spectrogram of 10–22 kHz with the cutoff (amber) and ceiling lines. **ADD** shows how much is being rebuilt. The footer shows the detected cutoff, the detection confidence (CONF) and the rebuilt range with its level relative to the whole track (dB REL).

> This is a rebuild, not a recovery. What is above the cutoff is gone from the file; the plugin creates a plausible new top end from what is below it. Lower AMOUNT if a track gets too bright.

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8. Slider tips

- **Drag** to adjust.
- Hold **Shift** while dragging for fine control.
- **Double-click** to reset to the default.

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9. Installation (FL Studio)

1. Close FL Studio. If you are updating, delete the old `AuralHealer.vst3` folder and `AuralHealer.clap`.
2. Copy the whole **AuralHealer.vst3** folder to `C:\Program Files\Common Files\VST3\`.
3. Optional: copy **AuralHealer.clap** to `C:\Program Files\Common Files\CLAP\`.
4. Start FL Studio → Options → Manage plugins → Find more plugins.
5. In the Mixer, select a track, click an empty slot and choose **AuralHealer**.

If Windows blocks the files: right-click the zip → Properties → tick **Unblock** → OK, then extract again. Saved projects keep their settings when you update.

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10. Technical notes

- **Latency:** 9216 samples at 44.1/48 kHz (about 209 ms at 44.1 kHz), reported to the host and compensated automatically by FL Studio. HF Restoration adds no extra latency.
- **Sample rates:** 44.1–96 kHz (others work too). Mono and stereo tracks.
- **Window:** fixed 1200 × 700 pixels, OpenGL.
- No installer and no presets. Parameters are saved with your project.

Known limitation

A soft, smooth crackle inside a sung vocal (not made of distinct pops) cannot be detected in a full mix: it sits well below the music in the same frequency range and has no feature that separates it from the music. Impulsive crackle (distinct small pops) is repaired in full mixes.

AuralHealer v1.0.3. Built with nih-plug and egui. UI font: JetBrains Mono (SIL OFL 1.1).