

# FONOCAL

## Low-End Control

User Guide · Version 1.4 · April 2026

Fonocal Low-End Control is an intelligent audio plugin that listens to your music, identifies low-end problems, and tells you exactly what to do about them — in plain language. It works equally well on a full mix, a bass instrument, a kick drum, or a drum bus.

Contents	
1. What Low-End Control does	2
2. Installation	2
3. Activating your licence	3
4. The interface at a glance	4
5. The five controls	5
6. The Intelligence panel	6
7. The Analyse button	8
8. The Apply button	9
9. Choosing the right mode	9
10. Step-by-step workflow	10
11. Practical tips	11
12. Frequently asked questions	12
13. Parameter reference	13

# 1. What Low-End Control does

Every mix has a low end — the frequencies below 400 Hz that carry bass, kick, warmth, and weight. When this region is out of balance, mixes sound muddy, boomy, or thin. Identifying exactly what is wrong used to require experience and a trained ear.

Low-End Control does the listening for you. It analyses a 2-second window of audio, measures energy across three frequency bands, and produces a specific diagnosis with an explanation in plain English. It then suggests the exact correction values needed — which you can apply in a single click.

## The three things it corrects

- **Mud** — Low-mid buildup in the 150–350 Hz region. This is what makes a mix sound congested, unclear, or like it is being played through a blanket.
- **Boom** — Excessive sub energy in the 30–120 Hz region. This causes bass to sound bloated, reduces headroom, and makes mixes translate poorly on smaller speakers.
- **Focus** — The width of the mud correction. A narrow (high focus) correction is surgical and precise. A wide (low focus) correction is gentler and broader.

A parallel Mix control lets you blend the corrected signal with the original, so you can apply as much or as little of the correction as the track needs. An Output gain stage lets you compensate for any level change.

# 2. Installation

## What you need

- Windows 10 or Windows 11 (64-bit)
- A DAW that supports the VST3 format (Cubase, Ableton Live, Studio One, Reaper, FL Studio, and most others)
- The Fonocal Low-End Control installer: `Fonocal_LowEndControl_Setup.exe`

## Installing with the installer

### Step 1 — Run the installer

Double-click `Fonocal_LowEndControl_Setup.exe` and follow the on-screen steps. The installer will copy the plugin to `C:\Program Files\Common Files\VST3\` automatically.

### Step 2 — Restart your DAW

Close your DAW completely if it was open, then reopen it. Run a plugin rescan — in most DAWs this is found under Preferences or Studio Setup.

### Step 3 — Find the plugin

Search for "Fonocal" or "Low-End" in your plugin browser. The plugin will appear as an audio effect and can be inserted on any audio track, instrument track, or bus.

*If the plugin does not appear after rescanning, close your DAW completely, verify the installer completed without errors, then reopen and rescan again.*

## 3. Activating your licence

Fonocal Low-End Control requires a valid licence to produce audio. When you open the plugin for the first time, an activation screen will appear in place of the normal interface. You need your purchase email address and the licence key from your FastSpring confirmation email.

### Where to find your licence key

After purchasing, FastSpring sends you an order confirmation email. Your licence key is included in that email in the format FNCL-XXXXX-XXXXX-XXXXX. If you cannot find the email, check your spam folder or visit [fonocal.com](http://fonocal.com) for support.

### Activating the plugin

#### Step 1 — Open the plugin in your DAW

Insert Fonocal Low-End Control on any track. The activation screen appears automatically.

#### Step 2 — Enter your email address

Type the email address you used when purchasing. This must match the address the confirmation email was sent to.

#### Step 3 — Enter your licence key

Type or paste your licence key exactly as received (e.g. FNCL-XXXXX-XXXXX-XXXXX). The key is not case sensitive.

#### Step 4 — Press Activate

The plugin contacts the Fonocal activation server. An internet connection is required for this step. On success, the activation screen disappears and the plugin opens normally.

## After activation

Your activation is stored on your computer. You do not need an internet connection to use the plugin after the first activation — it will open normally every time.

## Troubleshooting activation

Error message	What to do
"Email address does not match"	Use the exact email from your purchase confirmation. Check for typos or extra spaces.
"Licence key not found"	Double-check the key from your confirmation email. Make sure you are not confusing 0 (zero) with O (letter).
"Could not connect"	Check your internet connection. Firewalls or DAW sandboxing can sometimes block outgoing connections — try disabling temporarily or adding an exception for your DAW.
No confirmation email received	Check spam/junk folders. If still missing, contact support at <a href="mailto:support@fonocal.com">fonocal.com</a> with your order reference.

## 5. The interface at a glance

The plugin window is divided into two panels. The left side contains the controls — the knobs you use to shape the sound. The right side is the Intelligence panel — the analysis and explanation system.

### Left panel — Controls

Five rotary knobs arranged in two groups. The top group (Tone Shaping) contains the three correction controls: Mud, Tightness, and Focus. The bottom group (Output) contains Mix and Output. To the right of the Output knob is the analysis progress bar, which animates when you press Analyse.

Each knob shows its current value below it. You can click and drag up to increase a value, drag down to decrease it, or double-click to type a value directly. Right-click any knob to reset it to its default value.

### Right panel — Intelligence

The Intelligence panel contains everything related to the analysis system. Working from top to bottom: the Mode selector, three band energy meters, the condition strip, suggested values, the explanation text, the result summary, and the Analyse and Apply buttons.

### Header

The header at the top shows the plugin name and version number. The coral stripe on the left edge is a visual identity element.

## 5. The five controls

Each control can be set manually at any time, or set automatically by pressing Apply after an analysis. Both approaches produce the same result — Apply is simply a faster way to reach a starting point.

### Mud

Controls how much low-mid energy is cut. At 0% the filter is bypassed and the sound is unchanged. At 100% a 12 dB cut is applied at 250 Hz, which is the centre of the typical muddiness range. Most material benefits from 20–60% depending on how congested the low-mid region is.

*Use this when a mix sounds unclear, warm in an unflattering way, or when bass and kick are fighting each other for space in the low-mid range.*

### Tightness

Controls how much sub energy is reduced. At 0% the filter is bypassed. At 100% a 9 dB low-shelf cut is applied below 80 Hz. This does not remove the bass — it controls the weight and size of it. A tighter low end tends to translate better across different playback systems, from phones to club sound systems.

*Use this when the bass feels bloated or loose, when the mix lacks headroom, or when it sounds heavy on speakers but thin on headphones.*

### Focus

Controls the width (Q) of the Mud filter. At low values the cut is broad and gentle, affecting a wide range of frequencies around 250 Hz. At high values the cut is narrow and surgical, affecting a smaller band. Higher Focus is more precise but can sometimes sound unnatural if overused.

*When the analysis detects a concentrated buildup, it suggests a higher Focus value. For general mix bus work, a moderate Focus (40–60%) is usually appropriate.*

### **Mix**

Blends the processed signal with the original dry signal. At 100% you hear only the processed version. At 50% you hear an equal blend of both. At 0% the plugin is effectively bypassed regardless of the other settings.

*Using a partial mix (60–80%) is often more musical than full wet. It preserves the original low-end character while still cleaning up the problematic frequencies.*

### **Output**

Adjusts the overall output level after all processing. This is useful for compensating when heavy Mud or Tightness reduction makes the mix sound quieter. Range: -24 to +12 dB. Default: 0 dB.

## 6. The Intelligence panel

### Mode selector

Before pressing Analyse, set the Mode to match the source you are working on. This tells the analysis engine what kind of low-end content to expect, which affects how it interprets what it measures and how aggressive its suggestions are.

Mode	Use when...
Mix Bus	You have inserted the plugin on your master bus or a full stereo mix. Suggestions are conservative — the analysis knows the whole mix cannot be corrected as aggressively as an individual instrument.
Bass	You are working on a bass guitar, synth bass, or any low-frequency instrument. The analysis expects more sub energy and will not flag a heavy bass as a problem unless it is genuinely excessive.
Kick	You are working on a kick drum channel or bus. The analysis looks for low-mid bloom and sub control specific to kick drum behaviour, and suggests tighter corrections.
Drums	You are working on a full drum bus with kick, snare, and cymbals together. The analysis balances tightening and mud reduction across the full drum frequency picture.

*The selected mode is saved with your DAW project and preset. It will be restored when you reopen the session.*

### Band meters

The three horizontal bars show the real-time energy level of three frequency bands in the incoming signal. They update continuously while audio is playing.

Meter	Frequency range	What it shows
Sub	30–120 Hz	The weight and size of the bass and sub-bass. A full, wide bar here means strong sub content.
Mud	150–350 Hz	The low-mid density. A prominent bar here relative to the others often signals a muddiness issue.
Mid Ref	400–800 Hz	A clean reference band. The analysis uses this to understand the balance of the signal overall. You do not need to act on this meter directly.

*The dB value shown to the right of each bar is the average level in that band. A white peak marker holds the highest recent level for about one second before gradually falling back.*

## Condition strip

After you press Analyse, a coloured strip appears showing the detected condition. The colour of the left border gives you an instant severity reading.

Colour	Condition	What it means for your mix
Green	Balanced	The low end looks healthy. Little or no correction is needed.
Yellow	Low-mid buildup	Too much energy in the mud range. Clarity is likely suffering.
Coral/orange	Strong sub energy	The sub band is dominant. Headroom and punch may be affected.
Red-orange	Mud and sub	Both problems are present at the same time.
Blue	Thin	Very little low-end content. Heavy processing is not recommended.

## Explanation text

Below the condition strip, a text area shows a detailed plain-language explanation of what was found. This is written in the way an engineer would describe the issue — not in technical parameters, but in terms of what you will hear.

The wording adjusts based on how confident the analysis is. When confidence is high (signal was loud enough, enough audio was analysed) you will see direct statements: "Low-mid buildup around 200–300 Hz is present." When confidence is lower you will see hedged language: "Possible low-mid buildup detected."

## Suggested values

Four small cards show the suggested values for Mud, Tightness, Focus, and Mix. These are the values the plugin calculated based on the analysis. They are shown here so you can review them before deciding whether to apply them.

## Result summary

After you press Apply, a second text area appears below the explanation. This describes the audible outcome of what just changed — not which knobs moved, but what you should expect to hear differently. For example: "Low-end tightened and cleaned. Sub energy has been controlled and low-mid buildup reduced, improving both punch and clarity."

## 7. The Analyse button

Pressing Analyse starts a 1.5-second listening process. The progress bar to the right of the Output knob fills from bottom to top, showing a live percentage. When it reaches 100%, the analysis fires and the results appear in the Intelligence panel. The bar then briefly flashes to confirm completion before resetting.

### When to press Analyse

- While audio is playing — the plugin needs to hear actual signal to analyse.
- During the loudest, most representative section of the track. Do not analyse a breakdown, a silent section, or a sparse intro.
- After setting the Mode to match your source.

### Getting the best results

The analysis window is 2 seconds long. If you press Analyse and the bar is nearly full when audio starts (because the buffer already contains data from earlier), the results will reflect the last 2 seconds of audio that played through the plugin.

If the confidence shown after analysis is Low, it usually means the signal was too quiet or too short. Try playing a louder section and pressing Analyse again.

*You can press Analyse as many times as you like. Each press discards the previous result and starts a fresh analysis.*

## 8. The Apply button

Pressing Apply sets all five knobs to the suggested values in a single action. The Mud, Tightness, Focus, and Mix knobs all update simultaneously, and the result summary appears explaining the audible outcome.

Apply is a starting point, not a final answer. After pressing Apply, listen critically and adjust individual knobs by ear. The suggested values are derived from measurement and heuristics — your ears are the final judge.

*The Apply button is only active after a valid analysis has been completed. If no analysis has been run, the button is greyed out.*

## 9. Choosing the right mode

The Mode selector is the most important setting to get right before analysing. Using the wrong mode will produce suggestions that are calibrated for the wrong context.

### Common scenarios

Scenario	Use this mode
Mastering chain or mix bus	Mix Bus
Bass guitar DI or recorded bass	Bass
Synth bass or 808	Bass
Kick drum channel	Kick
Kick + bass combined bus	Kick or Drums
Full drum overhead bus	Drums
Drum room mic	Drums
Single instrument (not bass)	Mix Bus (most neutral)
Full arrangement stem	Mix Bus

*If you are unsure, Mix Bus is the most neutral option. It will not over-correct.*

## 10. Step-by-step workflow

The following workflow takes under a minute once you are familiar with it.

### Step 1 — Insert the plugin

Add Low-End Control as an insert effect on the track or bus you want to work on. Place it before any limiting or clipping, so it hears the full dynamic range.

### Step 2 — Set the Mode

Choose the mode that matches your source: Mix Bus, Bass, Kick, or Drums. This takes two seconds and significantly improves the quality of the analysis.

### Step 3 — Play the audio

Press play in your DAW and let audio run through the plugin. Watch the band meters in the Intelligence panel — you will see them respond to the signal as it plays.

### Step 4 — Press Analyse

Press the Analyse button while the audio is playing. Watch the progress bar fill over 1.5 seconds. Keep the audio playing during this time for best results.

### Step 5 — Read the results

The condition strip, explanation text, and suggested values all update. Read the explanation — it will tell you in plain language what was found and why a correction is or is not recommended.

### Step 6 — Press Apply (or adjust manually)

If the suggested values look reasonable, press Apply to set all knobs at once. Alternatively, adjust the knobs individually based on the suggestions and your own judgement. Both approaches are equally valid.

### Step 7 — Fine-tune by ear

Listen with Apply engaged. Read the result summary for context. Adjust Mud, Tightness, and Focus by ear from the suggested starting point. Use the Mix knob to blend back toward the dry signal if the correction feels too strong.

### Step 8 — Set the Output level

If the processed signal is noticeably louder or quieter than the bypass, use the Output knob to level-match. This makes A/B comparison with the bypass button more accurate.

## 11. Practical tips

### Getting the best from the analysis

- Analyse the section where all the main instruments are playing together. A chorus or a drop will give more representative results than a verse.
- For drum buses, loop a section with kick and snare together, not just hi-hats.
- If you get Low confidence, the signal was probably too quiet. Check your gain staging and make sure the meters in the Intelligence panel are moving visibly before pressing Analyse.
- You can press Analyse multiple times in the same session. Each result replaces the previous one.

### Getting the best from the controls

- Start with Apply and then back off the Mix knob to 60–80%. Full wet (100%) is often more than a mix needs.
- If the bass sounds thin after applying Tightness, reduce it by 10–20% from the suggested value. The goal is control, not removal.
- High Focus (80–100%) is powerful on a kick drum where you want a precise cut, but can sound unnatural on a full mix. Stay below 70% on the mix bus.
- The Output knob does not affect the analysis. You can change it freely without needing to re-analyse.

### Working with the Mix knob

The Mix knob is one of the most useful tools in the plugin. It lets you dial in exactly how much of the correction you want without changing any of the other settings. Think of it as a "how much" control that is separate from the "what kind" controls (Mud, Tightness, Focus).

*A good starting habit: press Apply, then immediately back the Mix knob off to 70%. Listen, then slowly bring it up or down from there. This approach usually lands faster than starting from the individual correction knobs.*

## 12. Frequently asked questions

### **Do I have to use the analysis system to use the plugin?**

No. All five knobs work independently and can be set entirely by ear. The analysis and explanation system is an optional assistant — not a requirement.

### **Can I automate the knobs?**

Yes. All five parameters are fully automatable in your DAW. You can draw automation curves for any of them just like any other plugin parameter.

### **Why is the Apply button greyed out?**

Apply is only available after a valid analysis has been completed. Press Analyse first, wait for the progress bar to complete, then Apply will become active.

### **The confidence shows "Low" — what should I do?**

Play a louder, busier section of your track and press Analyse again. Low confidence usually means the signal was too quiet or too short for the analysis to be reliable.

### **My DAW is not picking up the plugin after installing.**

Make sure the .vst3 file is in C:\Program Files\Common Files\VST3\ and that you have fully closed and reopened your DAW. A simple rescan without restarting is sometimes not enough for the first install.

### **Can I use this on a track that is already EQ'd?**

Yes. The plugin analyses whatever signal reaches it, whether raw or already processed. For the most accurate picture of the original source, place it before other EQ plugins.

### **What happens if I press Analyse while audio is not playing?**

The progress bar will fill but the analysis will reflect a silent signal. Confidence will be Low and suggestions will not be meaningful. Always analyse with audio playing.

### **Does the plugin add any latency?**

No. Low-End Control introduces zero samples of latency. It will not affect the timing of your mix or require delay compensation.

### **Will the Mode setting affect my sound?**

Mode only affects the analysis and the suggestions. It does not change how the audio is processed. Only the five knobs affect the sound.

### **What is the Mid Ref meter for?**

Mid Ref (400–800 Hz) is a clean reference band used internally by the analysis engine to understand the overall balance of your signal. You do not need to act on it directly — it is there for transparency.

## 13. Parameter reference

Quick reference for all adjustable controls.

Parameter	Range	Default	What it does
Mud	0 – 100%	0%	Peaking cut at 250 Hz. Controls low-mid clarity. 0 = off, 100 = maximum cut (-12 dB).
Tightness	0 – 100%	50%	Low-shelf cut below 80 Hz. Controls sub weight. 0 = off, 100 = maximum cut (-9 dB).
Focus	0 – 100%	50%	Q width of the Mud filter. Low = broad/gentle, High = narrow/surgical.
Mix	0 – 100%	100%	Blends processed and dry signals. 100% = fully processed. 0% = bypass.
Output	-24 to +12 dB	0 dB	Makeup gain after processing. Does not affect analysis.

### Analysis modes

Mode	Best used on
Mix Bus	Full stereo mix, master bus, stems, arrangement busses
Bass	Bass guitar, synth bass, 808, sub instruments
Kick	Kick drum channel, kick bus
Drums	Full drum bus, drum room mics, drum overhead bus

---

Thank you for using Fonocal Low-End Control. For support, updates, and other Fonocal products, visit [fonocal.com](https://fonocal.com).

*Copyright © 2026 Fonocal. All rights reserved. Fonocal Low-End Control is built with the JUCE framework ([juce.com](https://juce.com)).*