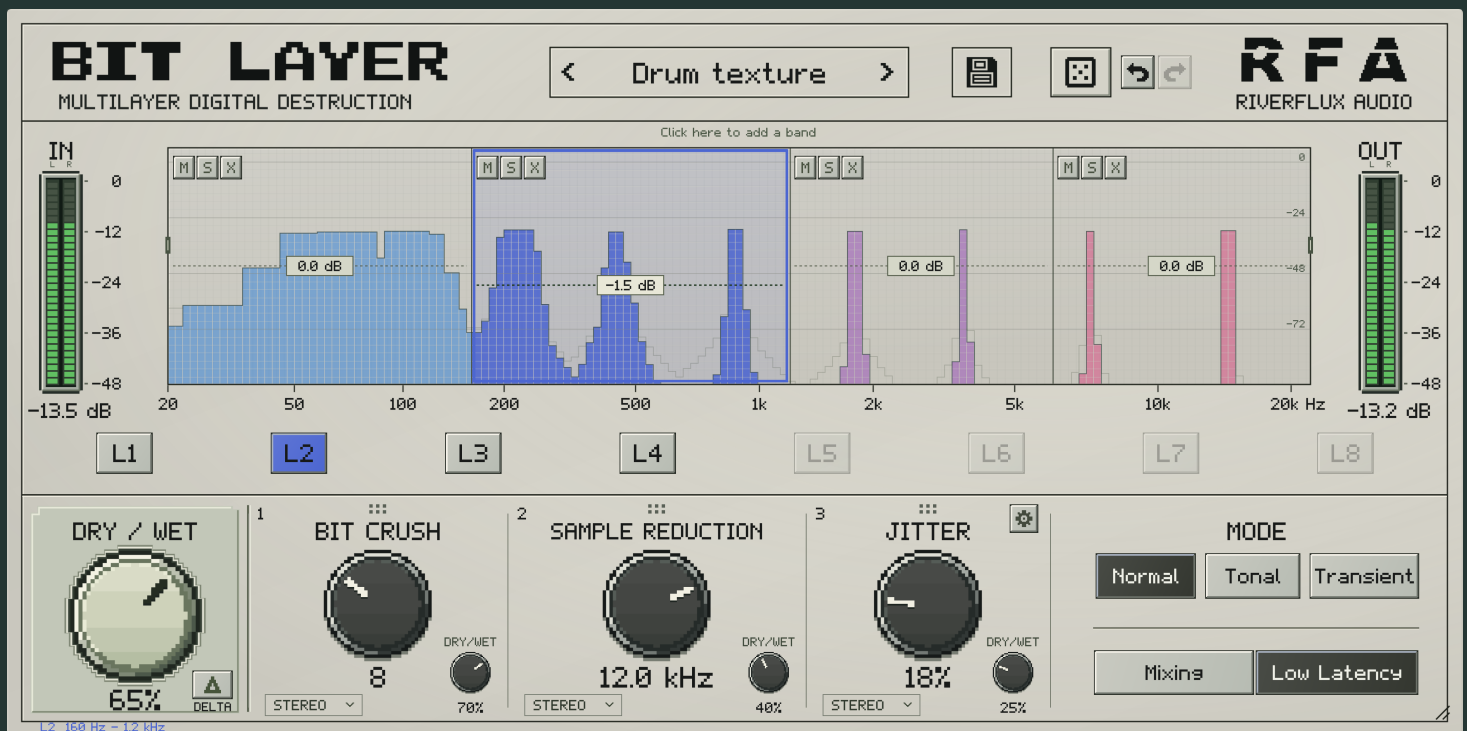


BIT LAYER

USER MANUAL

Bit crusher, sample rate reducer and jitter, in up to eight frequency bands



Bit Crush, Sample Reduction and Jitter on each band.

Contents

Page 3 gets you a sound in a minute. The rest is here for when you need it.

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Quick start

Put it on a track, wreck one band, blend to taste.



1 / Start clean

Load BIT LAYER on an audio track. A new instance does nothing to the sound: one band, 24 bits, sample reduction off, no jitter. To get back here later, press ? and choose Reset to Init.

2 / Break something

Turn Bit Crush down to around 8 bits, or Sample Reduction down to around 12 kHz. Each effect has a small Dry/Wet knob of its own, and the big knob on the left blends the whole plugin.

3 / Split the spectrum

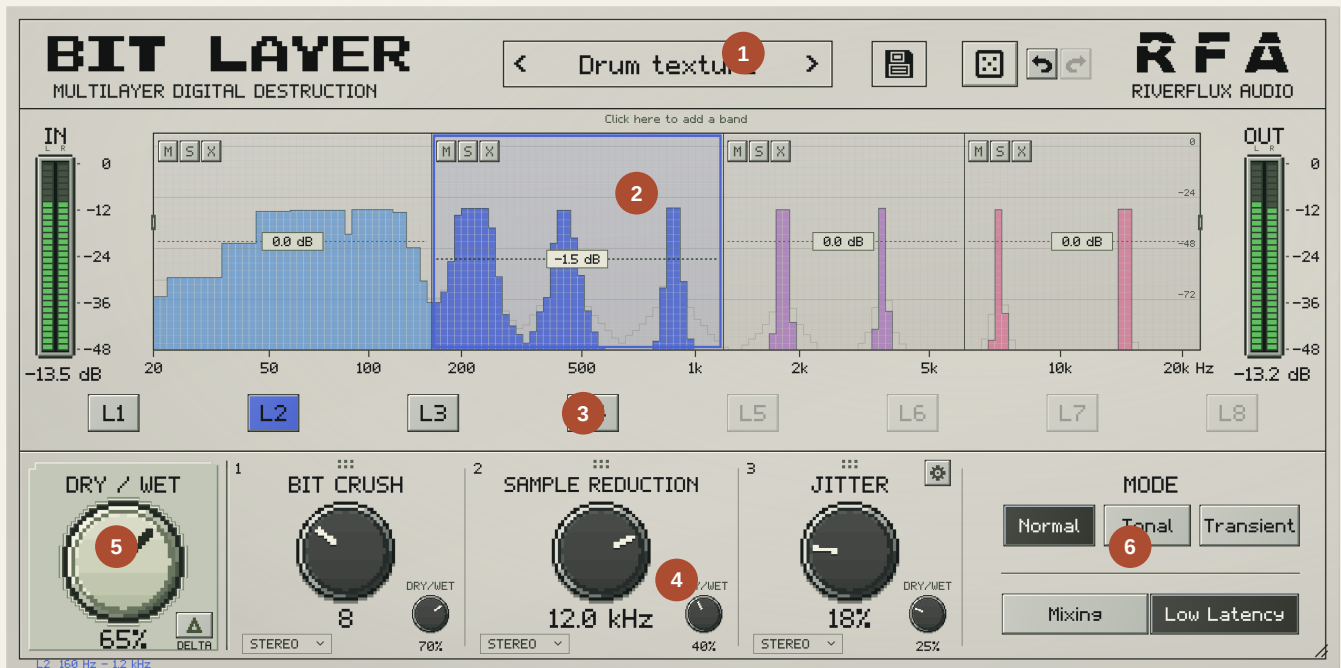
Click the thin strip above the graph to add a band. Pick a band with its L button and the three effects below now work on that band only. A common move is to leave the lows alone and crush the mids or highs.

4 / The two engines

Bottom right there are two buttons, Low Latency and Mixing. Low Latency is the default and adds no delay, so you can play and record through it. Mixing splits the bands more cleanly but delays the track by about 270 ms; your DAW lines that up on playback. More on page 12.

What is where

The band you select in the graph is the band the three knobs below are editing.



1 / Top bar

Arrows step through presets and the name opens the browser. The disk saves, imports and exports. The dice randomizes everything; Shift-click it to randomize only the selected band. The arrows next to it are undo and redo.

3 / L1 to L8

Select a band. Greyed-out buttons are bands you have not created.

5 / Dry/Wet and Delta

The big knob blends the whole plugin against the untouched input. Delta lets you hear only what the plugin is adding or removing.

2 / Graph

The spectrum of the incoming audio, coloured by band. M, S and X mute, solo and delete a band. The IN and OUT meters sit either side; there is no limiter, so watch OUT.

4 / Effects

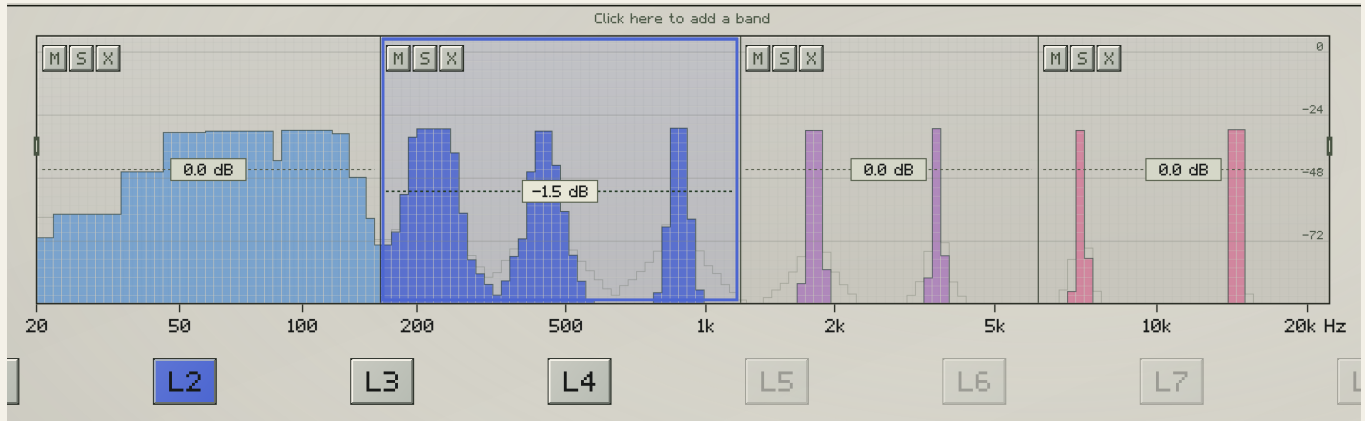
Bit Crush, Sample Reduction and Jitter, in series, for the selected band. Drag a panel by its six dots to change the order.

6 / Mode and engine

Normal, Tonal and Transient choose which part of the selected band gets processed. Mixing and Low Latency apply to the whole plugin.

Bands

One to eight bands, side by side. Anything outside the outer handles passes through untouched.



Add

Click the strip above the graph, or double-click inside the graph. The new band starts as a copy of the one you split.

Move

Drag a boundary. Hold Shift for fine steps. Double-click or right-click it to type a frequency. The two outer handles set where processing starts and stops.

Remove

Click X on a band, or select it and press Delete (the first band only has X). Its neighbour takes over the range. There is always at least one band.

Gain

Drag the dashed line up or down, -6 to +6 dB. Double-click it to go back to 0.

Mute and solo

M removes the band from the processed signal. S plays only the soloed bands. Remember to turn solo off when you are done.

Bypass

Alt-click a band to switch its effects off. The band still plays, just clean. This is different from Mute, which silences it.

The crossovers have slopes; they are not brick walls. A little of each band leaks into its neighbour.

Bit Crush

Fewer bits means bigger steps in level, which you hear as grit.



1 Bits

1 to 24. At 24 it does nothing. Below about 12 you start to hear it, below 6 it gets ugly fast.

2 Dry/Wet

Blends this effect only, before the signal moves on to the next one.

3 Stereo / Mid / Side

Which part of the stereo signal this effect touches. See page 9.

4 Number and handle

Click the number to type a value. Drag the six dots to move the effect in the chain.

In the picture: 8 bits, stage Dry/Wet 70%, Stereo

SIGNAL SKETCH / SCHEMATIC



Grey: input / Rust: simplified effect

Level matters

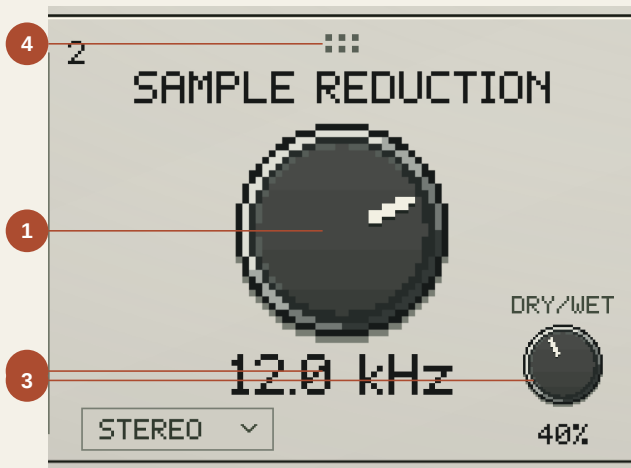
A crusher rounds the signal to a fixed set of levels. Loud audio uses many of them and keeps its shape. Quiet audio falls between the steps and can drop out completely, so the tail of a note can gate off at low bit depths. If that is not what you want, raise the bits or lower this effect's Dry/Wet.

What it does not do

No dither is added and nothing limits the output. Low bit depths can come out louder than the input, so keep an eye on the OUT meter.

Sample Reduction

Holds each sample for longer, like recording at a lower sample rate without filtering.



1 Rate

200 Hz to 48 kHz. Lower is rougher.

2 48 kHz is off

At the top of the range the effect does nothing, whatever sample rate your project runs at.

3 Dry/Wet

Blends this effect only.

4 Stereo / Mid / Side

As on the other two effects. The six dots move it in the chain.

In the picture: 12.0 kHz, stage Dry/Wet 40%, Stereo

SIGNAL SKETCH / SCHEMATIC



Grey: input / Rust: simplified effect

The extra tones are the point

Lowering the rate folds high frequencies back down as new tones that are not in tune with the music. That is the classic sampler sound. Sweep the knob while audio plays and you will hear them move.

Use it on a band

Full range it takes over quickly. On a band above 2 or 3 kHz it roughens hats, pick noise or the top of a synth and leaves the body of the sound alone.

Jitter

Random timing wobble. From slow drift to fast fizz.



1 Amount

0 to 100%. How far the timing moves. 0 is off.

2 Dry/Wet

Blends this effect only.

3 Gear

Opens Rate, Smooth and Stereo Link, explained below.

4 Stereo / Mid / Side

As on the other two effects.

In the picture: Amount 18%, stage Dry/Wet 25%, Stereo

SIGNAL SKETCH / SCHEMATIC



Grey: input / Rust: simplified effect

Rate and Smooth

Rate (0.1 to 200 Hz) is how often the wobble picks a new random target. Smooth (0 to 100%) is how gently it gets there. Low rate with high smooth sounds like tape drift. High rate with low smooth sounds like noise riding on the signal. The movement is random and does not follow tempo.

Stereo Link

On: left and right wobble together and the image stays put. Off: each side moves on its own, which sounds wider but can fall apart in mono. Check in mono if that matters to you.

Order and stereo routing

Each effect feeds the next, left to right. Each can work on stereo, mid or side.



01 / Bit Crush > Sample Reduction > Jitter



02 / The same stages, a different serial order

Order

Drag a panel by its six dots. Crushing before reducing sounds different from reducing before crushing, so try both. The order is set per band and changes without clicking.

Stereo, Mid, Side

Stereo processes left and right. Mid processes what the two sides share, usually the centre: vocal, kick, bass. Side processes the difference between them, the wide stuff.

Things to know

A mono track has no side signal, so Side does nothing on it. Anything you do on Side disappears when the mix is played in mono.

Dry/Wet and Delta

Small knobs blend one effect. The big knob blends the whole plugin.



1 Dry/Wet

0% is the untouched input, 100% is fully processed. The dry signal is delayed to match, so the blend does not comb-filter.

2 At 0%

You get the original signal back, whatever the bands are doing.

3 At 100%

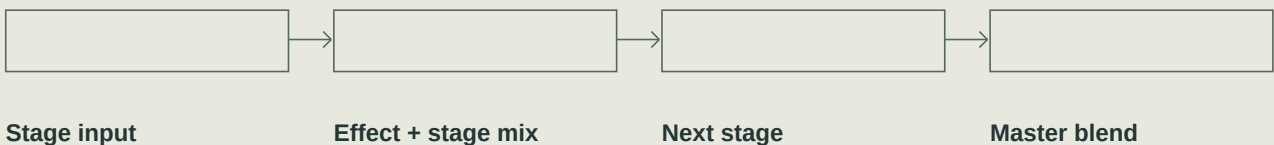
You hear only the processed path. Bands that are muted stay silent.

4 Delta

Plays processed minus dry: only what the plugin changed. Turn it off before you bounce.

In the picture: Dry/Wet 65%, Delta off

SIGNAL SKETCH / SCHEMATIC



Why two kinds of blend

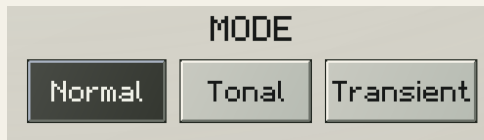
An effect's own Dry/Wet happens inside the chain, so the next effect processes the blend. The big knob happens at the very end. Half-crushed audio going into the sample reducer is not the same sound as a fully processed chain at 50%.

Delta can sound like the original

If the crusher gates a quiet passage to silence, the difference between that and the input is the input itself, upside down. That is expected.

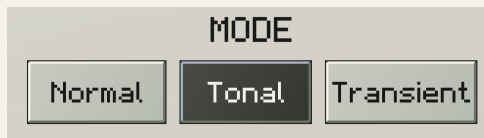
Normal, Tonal, Transient

Choose which part of the selected band the effects get to work on.



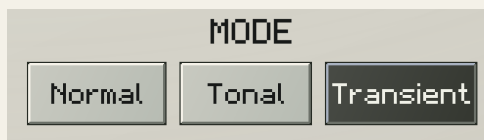
Normal

Everything in the band is processed. Start here.



Tonal

Only the sustained part is processed: held notes, the body of a sound. Attacks stay clean.



Transient

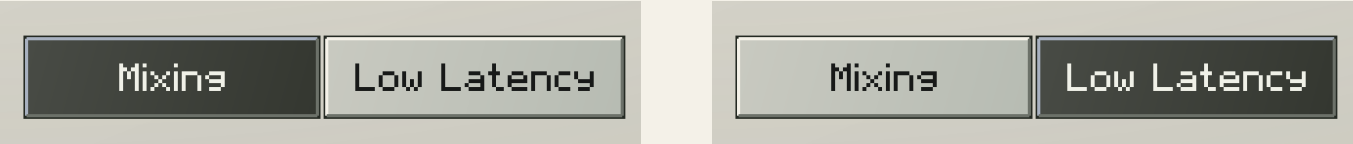
Only the attacks are processed: drum hits, picks, consonants. The sustain stays clean.

It is an estimate

The plugin has to guess what is an attack and what is sustain. On a single drum or a solo instrument it guesses well. On a dense mix or anything with a lot of reverb the split is blurrier. Gain, mute and solo always act on the whole band.

Mixing or Low Latency

Two ways of splitting the bands. One has no delay, one is cleaner.



Mixing

Bands are split with a spectral method that keeps the edges tidy. The price is delay: about 270 ms, which the plugin reports to your DAW. Playback and bounces stay in time. Playing or singing through it live does not work.

Low Latency

The default. Bands are split with ordinary crossover filters. No added delay, so it works for tracking, live use and anything you play in real time. The band edges overlap a bit more.

Switching

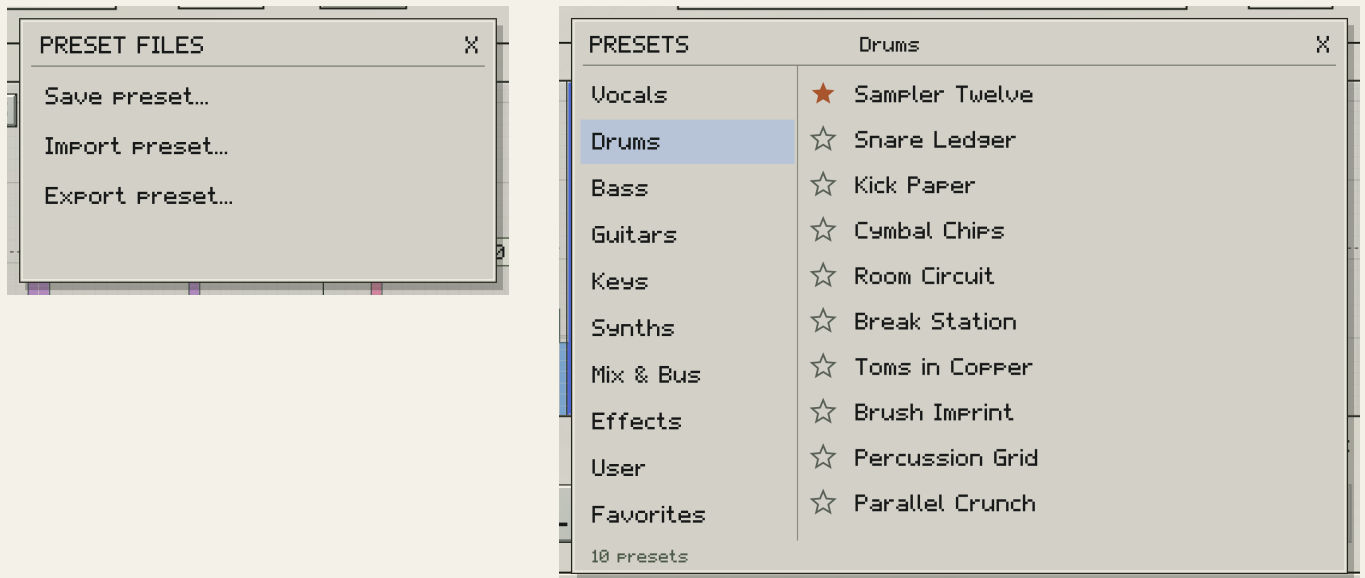
The two do not sound identical with the same settings, so pick one before you fine-tune. The choice is saved with your project, so projects made with Mixing still open in Mixing. Factory presets keep whichever one you are on.

Project sample rate	Mixing	Low Latency
44.1 kHz	12,736 samples (289 ms)	0
48 kHz	12,774 samples (266 ms)	0
96 kHz	25,542 samples (266 ms)	0
192 kHz	51,078 samples (266 ms)	0

If an instance in Mixing makes your whole session feel late while recording, this is why. Switch it to Low Latency until you mix.

Presets

88 factory presets, sorted by what you would put them on, plus your own.



Browse

Click the preset name. Pick a category on the left (Vocals, Drums, Bass, Guitars, Keys, Synths, Mix & Bus, Effects, User, Favorites), then a preset. The arrows in the top bar step through them without opening the browser.

Save

Disk icon, Save preset. Give it a name and a category. It shows up in the category you picked.

Where they live

Documents/BITLAYER/Presets, and favorites.json next to it. Copy that folder to move your presets to another computer. Installing an update or uninstalling does not touch it.

Favorites

Click the star next to a preset. Favorites belong to you, not to a project, so they show up in every session.

Import and export

Export writes a .bitlayerpreset file you can send to someone. Import loads one, or just drop the files on the plugin window.

Controls

Every control, its range and where it sits by default.

Control	Range	Default
Bit Crush	1 to 24 bits	24 (off)
Sample Reduction	200 Hz to 48 kHz	48 kHz (off)
Jitter Amount	0 to 100%	0% (off)
Jitter Rate	0.1 to 200 Hz	6 Hz
Jitter Smooth	0 to 100%	50%
Jitter Stereo Link	On / Off	On
Effect Dry/Wet (each)	0 to 100%	100%
Effect channel (each)	Stereo / Mid / Side	Stereo
Effect order	Any of the six	Crush, Reduction, Jitter
Band gain	-6 to +6 dB	0 dB
Band mode	Normal / Tonal / Transient	Normal
Bands	1 to 8	1
Main Dry/Wet	0 to 100%	100%
Engine	Low Latency / Mixing	Low Latency

Reset

Double-click any knob to put it back to its default.
Press ? and choose Reset to Init to reset the whole sound. That keeps the engine you are on.

Mouse and keys

Click in the plugin window first so the keys reach it.

To do this	Do this
Turn a knob	Drag up or down, mouse wheel, or arrow keys
Fine adjust	Hold Shift
Reset a knob	Double-click it
Type a value	Click the number under the knob, or right-click the knob
Select a band	Click it in the graph, click L1 to L8, or press 1 to 8
Add a band	Click the strip above the graph, or double-click the graph
Move a crossover	Drag it. Double-click or right-click to type a frequency
Band gain	Drag the dashed line. Double-click to reset
Bypass / solo a band	Alt-click / Ctrl-click (Cmd-click on Mac)
Delete a band	X on the band, or Delete
Reorder effects	Drag the six dots
Undo / redo	Ctrl+Z / Ctrl+Shift+Z (Cmd on Mac)
Randomize one band	Shift-click the dice
Help and Reset to Init	?
Resize the window	Drag the bottom-right corner

If a key does nothing

Some DAWs keep certain keys for themselves.
Everything can also be done with the mouse.

Installing

Close your DAW first. Afterwards, rescan plugins if BIT LAYER does not show up.

VST3 / CLAP / AUDIO UNIT ON MAC

Windows 10 or 11, 64-bit

Run BIT-LAYER-0.5.9-Windows-Setup.exe. Pick VST3, CLAP or both, then the folders: the standard ones, C:\Program Files\Common Files\VST3 and C:\Program Files\Common Files\CLAP, are filled in, and every DAW looks there. If you choose other folders, add them to your DAW's plugin folders. If a DAW is open, Setup asks you to close it first. Windows asks for administrator permission because the standard folders are shared by all users.

Mac, macOS 10.13 or later, Intel or Apple silicon

Open BIT-LAYER-0.5.9-macOS-Universal.pkg and follow it. It installs VST3, CLAP and Audio Unit under /Library/Audio/Plug-Ins. The installer is signed and notarized by Apple. Logic uses the Audio Unit.

Linux, 64-bit

Any distribution: run `sh BIT-LAYER-0.5.9-Linux-x64.run`. It installs to `~/.vst3` and `~/.clap` and needs no root. Debian or Ubuntu: `sudo apt install ./bit-layer_0.5.9_amd64.deb`. Needs glibc 2.31 or newer, which means Ubuntu 20.04, Debian 11 or anything more recent.

Updating and removing

To update, run the new installer over the old one. Your presets and projects are kept. To remove: on Windows use Installed apps, on Mac open Applications / Riverflux Audio / Uninstall BIT LAYER, on Linux run `~/.local/bin/bit-layer-uninstall` or `sudo apt remove bit-layer`.

Stuck? Write to us with your system, your DAW and what the installer said, and we will sort it out.

If something is off

The usual suspects.

What happens	What to check
Everything is late while recording	That instance is on the Mixing engine, which adds about 270 ms. Switch it to Low Latency (bottom right).
No effect	Main Dry/Wet at 0%? Band bypassed? Effect still at its off position (24 bits, 48 kHz, 0%)? Is there any audio in that band?
Side does nothing	The track is mono, or close to it. Set the effect to Stereo.
Quiet parts cut out	Low bit depths gate quiet audio. Raise the bits or lower that effect's Dry/Wet.
I hear the song in Delta	Expected when the processing removes part of the signal. Delta is the difference.
A muted band is still there	Main Dry/Wet below 100% lets the original through. Also check for a solo.
Sounds different after switching engine	The two engines split the bands differently. Adjust after switching.
Output is clipping	There is no limiter. Lower the band gains or turn the track down after the plugin.
Plugin does not appear	Check that your DAW scans the folder the plugin went to, then rescan. Remove any older copy named BITLAYER.
Presets are gone	They are in Documents/BITLAYER. If you moved computers, copy that folder across.

Before you bounce

Delta off, solos off, and the engine you meant to use.