

ENGINEERING EDITION

PRESSURE

User Manual v1.0



Mastering and mix-bus compressor

Plugin version 0.4.7 release candidate

01 / THE IDEA

Welcome to Pressure

Pressure is a focused stereo compressor for mastering, mix bus, drums, instruments and parallel work. It is not designed around extreme ratios or novelty modes. Its purpose is controlled movement: preserve the front edge, shape the body, create cohesion and make level decisions that survive honest comparison.

The fastest useful workflow

Load a suitable factory preset.

Set Input / Drive so the detector is working in the intended range.

Lower Threshold until the gain-reduction display moves musically.

Choose Clean, Glue or Lush.

Use Attack, Release and Relax to shape motion.

Set Mix for parallel compression when desired.

Engage Gain Match before deciding whether the result is better.

Start with 0.5-2 dB of gain reduction on a master or mix bus. Greater movement can be excellent on drums and parallel layers, but level-match the result before judging.

02 / ARCHITECTURE

Signal flow

1. Input / Drive	Applies -12 to +12 dB before detection and compression.
2. Sidechain HPF	Removes low-frequency energy from the detector only; audio bass remains in the program path.
3. Stereo detector	Combines RMS-like body information with peak information and links the channels.
4. Relax blend	Moves detection from fast transient emphasis toward slower musical mass.
5. Soft-knee compressor	Applies the selected Threshold, Ratio, Attack, Release and Character behavior.
6. Character stage	Clean remains neutral; Glue broadens behavior; Lush adds restrained nonlinear density.
7. Parallel Mix	Blends dry input with the compressed path.
8. Output	Applies -12 to +12 dB after the blend.
9. Bypass	Returns the unprocessed stereo input.

The detector is stereo-linked. A strong event in either channel creates the same gain movement in both channels, protecting image stability.

03 / LEVEL AND COMPRESSION

Main controls

Input / Drive	-12 to +12 dB. Changes both level into the detector and the amount of compression. Use it as the large musical pressure control.
Threshold	-36 to 0 dB. Lower values produce more gain reduction.
Ratio	1:1 to 4:1. The deliberately moderate range favors mastering and bus behavior over hard limiting.
Attack	1 to 200 ms. Faster values control the leading edge; slower values allow more punch.
Release	50 to 2000 ms. Short values recover quickly; long values create smoother motion.
Output	-12 to +12 dB after processing. Use for final level alignment when Auto Gain and Gain Match are off.

04 / MOTION

Detector and parallel controls

Relax	0 to 100%. At 0%, the detector follows fast peak emphasis. At 100%, it leans toward the slower body envelope.
Sidechain HPF	20 to 500 Hz. Raises the detector floor so bass energy causes less compression.
Mix	0 to 100%. 0% is dry; 100% is fully compressed. Intermediate values create parallel compression.
RMS / Peak display	Changes the monitoring emphasis of the central view; it does not change the stored compressor parameters.
Gain-reduction history	Shows recent gain movement so pumping, over-release and transient over-control are visible over time.

Relax and sidechain filtering solve different problems. Relax changes time emphasis between peak and body behavior; the HPF changes frequency emphasis in the detector.

05 / CLEAN, GLUE, LUSH

Character modes

Clean	8 dB knee, standard release behavior, no added nonlinear color. The transparent choice.
Glue	11 dB knee with a slightly longer effective release. A subtle dry-path relationship helps maintain continuity.
Lush	14 dB knee with a longer effective release and restrained tanh density. The most colored, forgiving mode.

Character is not a cosmetic label. It changes knee width, recovery behavior and - in Lush - the nonlinear output of the wet path. Recheck Threshold and Output after changing modes.

06 / TRUST YOUR EARS

Level tools and comparison

Auto Gain	Provides restrained automatic makeup, capped at 3 dB. Useful for fast setup.
Gain Match	Uses current gain reduction to create a closer loudness comparison. It is a working aid, not a mastering loudness guarantee.
A / B / C	Three internal snapshots for comparing complete control states.
Undo / Redo	Ten control snapshots in each direction. Theme changes are intentionally excluded from audio-control history.
Bypass	Returns dry input for a direct processed/unprocessed check.

Important: Auto Gain and Gain Match serve different purposes. Auto Gain accelerates setup. Gain Match helps judge whether the processing itself improved the music.

07 / SIX MUSICAL LIBRARIES

Presets and favorites

Pressure includes 60 factory presets: ten each in Mastering, Mix Bus, Transparent, Glue, Lush and Dynamic. Presets are starting points; input level and source crest factor always affect the amount of gain reduction.

Mastering	Low-ratio, controlled movement and conservative recovery.
Mix Bus	Cohesion with more audible timing choices.
Transparent	Clean-mode control that protects transient identity.
Glue	Connected center and deliberate rhythmic recovery.
Lush	Softer density and polished parallel color.
Dynamic	More active movement for drums, instruments and energetic buses.

Click a star to store a favorite. The star fills with the current theme color. Factory DEL hides a row during the editor session rather than destroying factory data.

08 / REPEATABLE WORK

Save, Load and session recall

SAVE	Writes a .pressurepreset file containing the current Pressure state.
LOAD	Reads a .pressurepreset file and restores its controls.
Session recall	The host state includes audio parameters, favorites and interface theme.
Previous / Next	Moves through the complete factory library from the top preset rail.
User Presets	Saved files can be organized outside the factory library and recalled through Load.

For reliable collaboration, send the .pressurepreset file with the session and note the plug-in version. Host automation remains tied to stable parameter IDs.

Metering and reading motion

The center display reports current gain reduction and a recent 96-point history. The right-side meters show stereo input and output activity. Use them to find timing problems, not to replace listening.

Flat line near 0 dB	The signal is below Threshold, the sidechain filter is excluding dominant energy, or Ratio is close to 1:1.
Sharp isolated dips	Transient-focused compression. Raise Attack or Relax if the front edge feels pinched.
Long low plateaus	Release may be too slow, or Threshold may be too low.
Rhythmic waves	Compression is following the groove. Decide whether that motion helps the song.
Unequal L/R meter levels	The source is asymmetric; gain reduction remains linked for stereo stability.

10 / FINAL-STAGE CONTROL

Mastering workflow

Begin in Clean or Glue. Set Ratio between 1.2:1 and 1.8:1. Use a slower Attack to preserve transient life, then tune Release so the history returns naturally between musical phrases. Raise the sidechain HPF when kick or bass drives too much movement.

A practical mastering sequence

Start with Mix at 100% and Gain Match on.

Aim for roughly 0.5-2 dB gain reduction on loud passages.

Switch between Clean and Glue, then reset Threshold if necessary.

Increase Relax when high-frequency events feel nervous.

Use Output only after the processing decision is made.

Check bypass at equal apparent loudness.

Pressure is a compressor, not a limiter. Leave final true-peak control and delivery ceiling to the limiter later in the chain.

11 / GROOVE

Mix-bus and drum workflows

For mix bus, begin with Glue, 1.5:1-2:1, Attack around 20-80 ms and Release around 150-600 ms. Tune to the music rather than tempo mathematics alone.

Parallel drums

Choose Glue or Lush.

Use faster Attack and a lower Threshold for obvious movement.

Set Sidechain HPF high enough that the kick does not dominate every event.

Pull Mix down to 30-70% and blend beneath the dry kit.

Use Gain Match before deciding that the blend adds energy.

For vocals and instruments, Lush can add density at moderate ratios. Use slower release for continuity and lower Mix when consonants or pick attack need to remain forward.

12 / DETECTOR MATHEMATICS

Engineering notes

Pressure converts detector level to dB, applies a soft-knee gain-reduction law, then smooths the gain coefficient. In simplified form:

$x = \text{level} - \text{threshold}$

$\text{slope} = 1 - 1/\text{ratio}$

$\text{GR} = \text{slope} \times x$ above the knee, with a quadratic transition inside the knee.

The detector combines approximately 78% body energy and 22% peak energy before Relax blends toward the fast peak envelope. Maximum instantaneous gain reduction is constrained to 6 dB. Auto Gain is capped at 3 dB.

These limits are deliberate. Pressure is tuned as a controlled musical compressor, not an unlimited dynamics laboratory.

Automation and technical behavior

Automation	Input, Threshold, Ratio, Attack, Release, Mix, Relax, Sidechain HPF, Output, Character, Auto Gain, Gain Match and Bypass are host parameters.
Stereo format	Stereo input and stereo output. Unsupported layouts are rejected.
State	JUCE ValueTree state serialization for host recall.
Resizing	Fixed aspect ratio with menu sizes of 80%, 100%, 120% and 150%.
Themes	Ruby Black, Rustic Teal, Rustic Blue and Deep Purple. Theme selection is saved but excluded from audio Undo/Redo.
Formats	AU and VST3 production targets. Validate each release build in the supported host matrix.

When automating fast changes, listen for musical discontinuities. Threshold and Mix are generally the safest performance controls; mode changes are better placed at section boundaries.

14 / RELEASE CONFIDENCE

Troubleshooting and final checklist

Too much pumping	Raise Sidechain HPF, increase Relax, lengthen Release or reduce gain reduction.
Transients feel dull	Slow Attack, reduce Ratio, raise Mix toward dry, or choose Clean.
Result sounds louder, not better	Enable Gain Match and reduce Output.
Not enough movement	Lower Threshold, raise Input / Drive, reduce Relax or choose a more active preset.
Preset missing	Check category filters, Favorites and hidden factory rows; factory data remains protected.
Undo changes theme	This should not occur in v0.4.7. Theme is excluded from control history.
No audio	Check Bypass, host routing, Mix, Output and whether the correct AU/VST3 instance is loaded.

Final test before delivery

Confirm sample-rate changes and host reopening.

Verify every control, mode and meter.

Recall A/B/C, favorites and user preset files.

Test ten Undo and ten Redo operations.

Cycle all four themes and all interface sizes.

Compare bypass and Gain Match at equal loudness.

Check conservative mastering and active parallel use cases.

PRESSURE

Control the movement. Keep the music alive.

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