

CS-5501 V2

CHANNEL STRIP



MANUAL

TBProAudio

2024

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1 Introduction

Welcome to CS-5501, a channel strip plugin with gate/expander, EQs, compressor, saturation, limiter, de-esser, extensive side-chain and stereo placement options, flexible module routing, over sampling and AB_LM-Lite for perceptual loudness matching.

2 Features

CS-5501 offers following features:

- 2x 7 band EQ
- 2x noise gate/expander
- 2x compressor, VCA/FET/OPTP design
- 2x de-esser
- 2x limiter
- 2x saturation
- 2x thermal noise for analogue sound emulation
- 2x clip
- full dual mono processing
- serial and parallel processing
- HQ over sampling
- linkable input/output fader including phase inversion
- module parameter link
- copy/paste module settings (across all instances)
- extended metering, input/output/gain reduction, Peak, RMS, EBU and VU
- DAW synced oscilloscope
- spectrum analyzer
- peak level display
- perceptual loudness matching (powered by ABLM Lite) and gain “freezing”
- flexible ABLM Lite routing options
- module routing
- extensive side-chain support for many effect modules
- many comfort functions like soloing and signal monitoring
- mono mode on stereo channel
- parameter randomizer
- preset management
- module preset management
- undo/redo
- selectable colour theme
- large and easy to use GUI
- free GUI scaling
- 64-bit internal processing
- very efficient CPU usage design
- smart silence processing

3 Overview

CS-5501 is a multi functional channel strip providing all necessary tools to process all kind of audio signals like vocals and instruments.

TBProAudio CS-5501 Overview



CS-5501 comes with double EQ/compressor/limiter/gate/expander/de-esser/saturation/clip and thermal noise emulation. All modules have stereo placement options and are freely routable. Some of the effect modules have external side chain options. Each module can work either in serial or parallel mode.

CS-5501 provides also IN/OUT/GR VU meter, IN/OUT fader, extensive monitoring functions and over sampling.

CS-5501 includes an oscilloscope, a spectrum analyzer and a peak level display.

On top CS-5501 adds the function called ABLM Lite providing perceptual loudness matching.

4 Minimum System Requirements

- Windows 7, OpenGL 2 GFX card
- Mac OS X 10.11, Metal GFX card
- SSE2 CPU
- Win: 32/64 Bit VST, 32/64 Bit VST3, 32/64 Bit AAX
- OS X: 64 Bit VST, 64 Bit VST3, 64 Bit AU, 64 Bit AAX
- Tested with: Cockos Reaper, Steinberg Cubase/Nuendo/Wavelab 6+, FL Studio 12+, PT2018+, Reason 9.5+, Studio One, Ableton Live
- For latest information please visit www.tbproaudio.de

5 Plugin Controls

Mouse usage:

Click and drag horizontally changes parameter value

Shift click and drag changes parameter value slower

Ctrl click resets to default value, double click on text opens text entry

Please note that any parameter change of an effect parameter also enables the unit itself (auto activation)

5.1 Preset

5.1.1 Preset



Preset menu loads and saves user presets. Presets stored under %localappdata%/CS5501V2 (Windows) or /Users/xxx/Library/Application Support/ CS5501 V2 (Mac OSX) are imported as user presets. Previous and next buttons step through all factory presets.

The parameter randomizer modifies the current parameter set on a random base, only active modules.

5.2 Display section



The icon on the right of the preset area changes the display either to VU meters, oscilloscope, spectrum analyzer or peak level display.

5.2.1 VU Meter



CS-5501 provides the open (plugin menu) to set VU meter reference level for left and right channel independently (dual mono processing).

5.2.1.1 Meter display



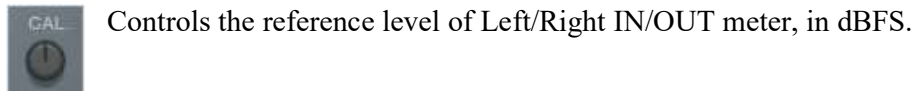
Left/Right IN/OUT VU meter with standard ballistics. Left value shows the current meter value (in dB/LU/VU), right value shows the maximum value. Mouse click on the meter resets the meter. The red LED indicates values above 0;

5.2.1.2 Meter mode

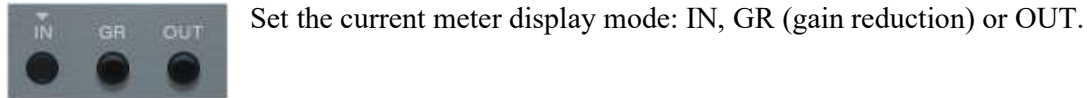


Click here to change the meter mode: PEAK (dB), RMS (dB), EBU ML (LU), EBU SL (LU) and VU (dBVU). RMS uses 600ms ballistics, VU 300ms.

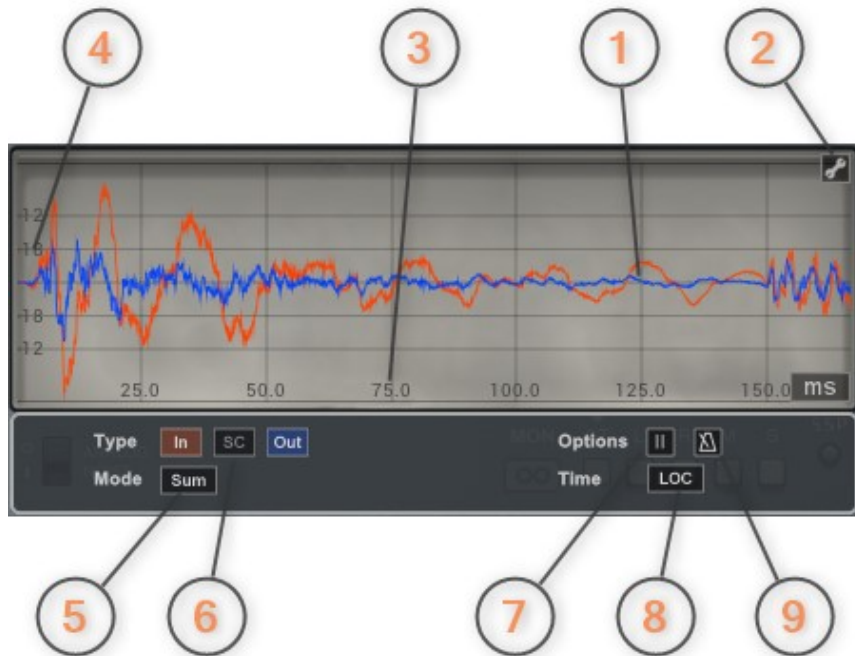
5.2.1.3 Meter calibration



5.2.1.4 Meter display mode



5.2.2 Oscilloscope



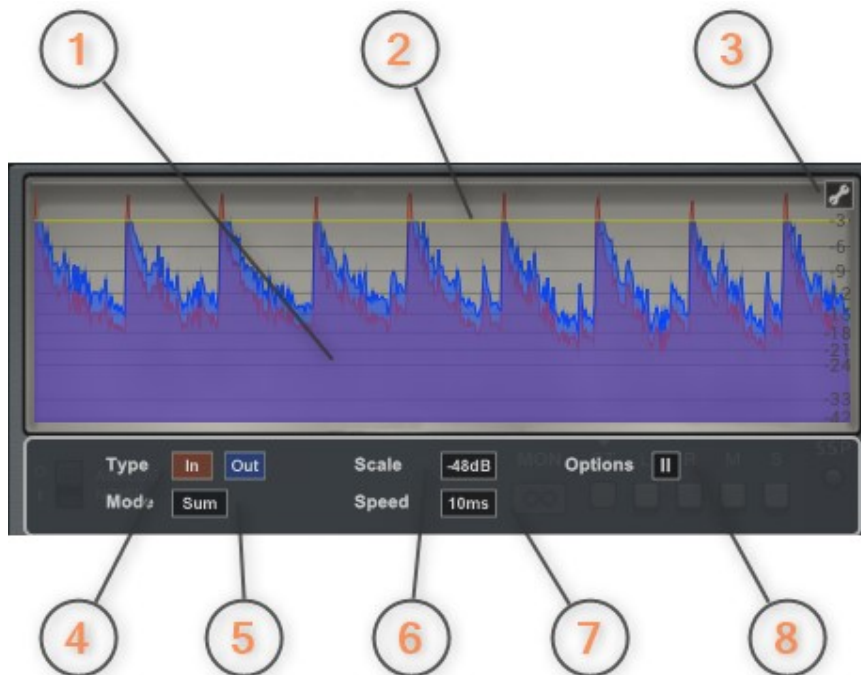
- 1) The oscilloscope displays the signal amplitude over the time. The buffer of the oscilloscope stores one second maximum.
- 2) Shows configuration page
- 3) Time scale. Mouse wheel zooms in/out. Mouse drag moves zoomed time range. Mouse click, hold and move up zooms and moves time range.
- 4) Magnitude scale. Mouse wheel zooms in/out. Mouse click, hold and move right zooms magnitude.
- 5) Signal mode selector. Shows either summed stereo, left, right, mid or side channel
- 6) Signal display selector. Shows input (after input fader), side-chain and output (before output fader) signal.
- 7) Pauses update of the display
- 8) Time setting: either buffer length in ms if DAW sync is off or tempo synced if DAW sync is on:
LOC: DAW time selection/locator information is used
1/x note: loop buffer is set to specific note length
x bar: loop buffer is set to DAW bar length (tempo and time signature)
- 9) DAW sync off/on: if off buffer length is adjusted with time control

5.2.3 Spectrum analyzer



- 1) The spectrum analyzer displays the frequency spectrum of the audio signals.
- 2) Shows configuration page
- 3) Frequency scale. Mouse wheel zooms in/out. Mouse drag moves zoomed frequency range. Mouse click, hold and move up zooms and moves frequency range.
- 4) Magnitude scale. Mouse wheel zooms in/out. Mouse click, hold and move right zooms magnitude.
- 5) Signal mode selector. Shows either summed stereo, left, right, mid or side channel
- 6) Signal display selector. Shows input (after input fader), side-chain and output (before output fader) signal.
- 7) Changes spectrum tilt
- 8) Changes analyzer speed
- 9) Pauses update of the display
- 10) Shows maximum spectrum
- 11) Shows Spectrum as bars
- 12) Shows EQ response curve

5.2.4 Peal level display



- 1) The peak level display shows the envelope of the audio signals over a period of time.
- 2) Yellow line shows the clip level
- 3) Configuration page
- 4) Input/output signal
- 5) Sum/left/right/mid or side signal
- 6) Display scale -12/-18/-24/-36/-48 dBFS
- 7) Update speed 10/20/50/100ms or infinite
- 8) Pause display update

5.2.5 Monitor



Controls the main monitor mode: either stereo (normal), left, right, mid or side signal.

5.2.6 Monitor mode



Set the monitor mode either to in-place or centred.

5.3 Over sampling & Bypass

5.3.1 Over sampling



Incoming signal could be over-sampled up to 2 or 4 times. Over sampling reduces magnitude/phase distortions near Nyquist frequency and let the filter sound much more "analogue".

5.3.2 Bypass



Global plugin by-pass.

5.4 Fader section

5.4.1 Input/output fader



CS-5501 provides independent left/right faders for incoming and outgoing signal. Double click on the fader handle enables direct value input.

5.4.2 Input phase



This control lets you invert the phase of incoming left and right signal

5.4.3 Link input/output fader



Toggles linkage of left and right input/output fader.

5.4.4 Link output to input fader



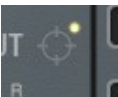
If enabled movement of input faders changes output fader in reverse direction.

5.5 ABLM Lite



Please refer to chapter 6.

5.6 ABLM Lite gain freeze



Freezes ABLM Lite gain and switches ABLM Lite to off. Small yellow LED indicates if freeze gain is active. Please refer to chapter 6.

5.7 Routing



This section controls the order of the individual effect modules. Click the slot where you want to change the effect and select the new effect from the drop-down menu.

Shift click shows the respective module. Click on the small left icon below the drop-down menu to show the corresponding module.

The yellow LED indicates the power status of the module. Click to activate/deactivated the effect, shift click to show the module.

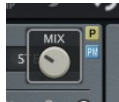
The blue solo button indicates the solo state of the module. Click to solo/un-solo the effect module. Shift click adds module to solo group.

5.8 Processing modules



Each processing module provides a menu (top left area): Copy/paste module settings (even across CS-5501 instances), load/save module settings and quick load of presets.

5.8.1 Serial and parallel processing



Each module can work either in serial or parallel mode. In parallel mode module 1 and 2 are processed in parallel and then mixed depending on the mix knob. The routing position of both modules is determined by position of module 1.

5.9 EQ



CS-5501 provides 2 independent EQ modules with 7 filters each. The filters are based on analogue design and minimize amplitude cramping near Nyquist frequency. This lets the filter sound much softer than normal digital filters.

5.9.1 EQ Module selector



Select EQ1/EQ2 module from drop-down menu

5.9.2 Off/On



Enables the module.

5.9.3 Solo



Solos the module. Shift mouse click resets solo states of all modules.

5.9.4 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.9.5 Filter band monitor



Each filter band (except LC/HC) can be monitored.

5.9.6 LC/HC



Low-cut/high-cut filter with switchable filter slope

5.9.7 HF/LF



Peak/shelf filter with adjustable Q-factor.

5.9.8 HMF/MF/LMF



Peak filter with adjustable Q-factor.

5.10 Compressor



CS-5501 provides 2 independent compressor modules. The compressor squeezes the incoming signal depending on threshold and ratio.

The compressor design is based on TBProAudio's Impress and offers 3 different classical types:

VCA stands for "Voltage Controlled Amplifier" and its compression behavior is based on PEAK, with fast attack and release.

FET stands for "Field Effect Transistor". The 1176 is his most prominent representative and offers very short attack and release times.

OPTO stands for "Optical compressor" and its compression behavior is based on RMS, with slow attack and release.

FET 1 offers a compressor ratio much closer to the original.

5.10.1 Effect module selector



Select effect module from drop-down menu

5.10.2 Off/On



Enables the module.

5.10.3 Parameter link



Links parameter of compressor 1 and 2.

5.10.4 Solo



Solos the module. Shift mouse click resets solo states of all modules

5.10.5 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.10.6 Side chain options

5.10.6.1 Internal/External



Selects either internal or external side chain. VST2 uses channel 3+4 as ext. side chain. For VST3/AU/AAX/RTAS please consult your DAW manual.

5.10.6.2 Monitor



Lets you monitor the side chain signal

5.10.6.3 Low-cut



Off/On: enables low-cut
Slope: sets filter slope
Frequency: sets filter cut-off frequency

5.10.6.4 High-cut



Off/On: enables high-cut
Slope: sets filter slope
Frequency: sets filter cut-off frequency

5.10.6.5 Link



Toggles linkage of LC and HC frequency.

5.10.7 Compressor type



VCA, FET or OPTO design

5.10.8 Threshold



Sets threshold value, in dBFS.

5.10.9 Attack



Sets attack-time, in ms. Lower values make the compressor more responsive.

5.10.10 Release



Sets release-time, in seconds. Higher values make the compressor longer working.

The metronome icon enables DAW tempo synced release times.

5.10.11 Auto release

Enables program dependent release time calculation



5.10.12 Ratio



Sets compression ratio.

5.10.13 Output



Sets output volume, in dB.

5.10.14 Mix



Set mixing-ratio of compressed and original signal, from 0 % (dry) - 100 % (wet).

5.10.15 Gain reduction meter



Shows current gain reduction, in dB

5.11 Gate/Expander



CS-5501 provides 2 independent gate/expander modules. Gate/Expander opens only if the signal reaches a certain threshold.

5.11.1 Effect module selector



Select effect module from drop-down menu

5.11.2 Off/On



Enables the module.

5.11.3 Parameter link



Links parameter of gate 1 and 2.

5.11.4 Solo



Solos the module. Shift mouse click resets solo states of all modules.

5.11.5 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.11.6 Side chain options

5.11.6.1 Internal/External



Selects either internal or external side chain. VST2 uses channel 3+4 as ext. side chain. For VST3/AU/AAX/RTAS please consult your DAW manual.

5.11.6.2 Monitor



Lets you monitor the side chain signal

5.11.6.3 Low-cut



Off/On: enables low-cut
Slope: sets filter slope
Frequency: sets filter cut-off frequency

5.11.6.4 High-cut



Off/On: enables high-cut
Slope: sets filter slope
Frequency: sets filter cut-off frequency

5.11.6.5 Link



Toggles linkage of LC and HC frequency.

5.11.7 Gate/Expander mode switch



Toggles between gate and expander mode.

5.11.8 Threshold



Sets threshold value, in dBFS.

5.11.9 Attack



Set attack time, in ms. Lower values make the gate/expander more responsive.

5.11.10 Hold



Sets hold time, in ms. Lower values start release earlier.

5.11.11 Release



Set release time, in ms. Higher values make the gate/expander longer open.

5.11.12 Range



Variable range, in dB. In gate mode min value -72dB is treated as range off.

5.11.13 Attenuation meter

Shows current signal attenuation, in dB



5.12 De-esser



CS-5501 provides 2 independent de-esser modules. Deesser is a kind of dynamic EQ. It compresses/expands the signal in a defined frequency range depending on the input/side-chain signal. The design is based on TBProAudio's dEQ6.

5.12.1 Effect module selector



Select effect module from drop-down menu

5.12.2 Off/On



Enables the module.

5.12.3 Parameter link



Links parameter of de-esser 1 and 2.

5.12.4 Solo



Solos the module. Shift mouse click resets solo states of all modules.

5.12.5 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.12.6 Side chain options

5.12.6.1 Internal/External



Selects either internal or external side chain. VST2 uses channel 3+4 as ext. side chain. For VST3/AU/AAX/RTAS please consult your DAW manual.

5.12.6.2 Monitor



Lets you monitor the side chain signal

5.12.6.3 Low-cut



Off/On: enables low-cut
Slope: sets filter slope
Frequency: sets filter cut-off frequency

5.12.6.4 High-cut



Off/On: enables high-cut
Slope: sets filter slope
Frequency: sets filter cut-off frequency

5.12.6.5 Link



Toggles linkage of LC and HC frequency.

5.12.7 Filter type



Low-shelf/bell/high-shelf filter type.

5.12.8 Narrow band/wide band



In wideband (WB) mode the de-esser reacts on events in the full frequency range, in narrowband mode (NB) only on events around de-esser centre frequency.

5.12.9 Listen



Lets you listen to the signal removed by the de-esser or to signal focused by the de-esser.

5.12.10 Threshold



Sets threshold value, in dBFS.

5.12.11 Q



Sets filter bandwidth.

5.12.12 Frequency



Sets centre frequency.

5.12.13 Attack



Sets attack-time, in ms. Lower values make the compressor more responsive.

5.12.14 Release



Sets release-time, in seconds. Higher values make the compressor longer working.

5.12.15 Ratio



Set compression ratio.

5.12.16 Gain



Set static filter gain, in dB.

5.12.17 Output



Sets output volume, in dB

5.12.18 Range



Limits the gain reduction to a certain range.

5.12.19 Gain reduction meter



Shows current gain reduction (blue) or gain boost (green), in dB.

5.13 Limiter



CS-5501 provides 2 independent limiter modules.

The limiter keeps the signal below a certain “ceiling” level. The design is based on TBProAudio’s LAXLimiter.

Please to note that Limiter introduces 128 smp latency, this is compensated by the DAW.

5.13.1 Effect module selector



Select effect module from drop-down menu

5.13.2 Off/On



Enables the module.

5.13.3 Parameter link



Links parameter of limiter 1 and 2

5.13.4 Solo



Solos the module. Shift mouse click resets solo states of all modules.

5.13.5 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.13.6 Gain



Controls the additional input gain, in dB.

5.13.7 Release

Sets the release time, in ms



5.13.8 Auto release

Enables program dependent release time calculation.



5.13.9 Ceiling

Set the maximum output level, in dBFS.



5.13.10 Gain reduction meter

Shows current gain reduction, in dB.



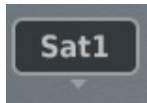
5.14 Saturation



CS-5501 provides a saturation module.

Saturation adds odd or even harmonics to the signal. The saturation effect emulates several tubes with odd and even harmonics.

5.14.1 Effect module selector



Select effect module from drop-down menu

5.14.2 Off/On



Enables the module.

5.14.3 Solo



Solos the module. Shift mouse click resets solo states of all modules.

5.14.4 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.14.5 Tube Character



Select either clean/warm/crisp/classic saturation type. Character “classic” is from former CS-3301 plugin

5.14.6 Stages



Sets number of stages to enrich the effect.

5.14.7 Fluctuation

Controls the amount of saturation fluctuation, in percent.



5.14.8 Odd

Controls the amount of odd harmonics added to the signal, in percent.



5.14.9 Even

Controls the amount of even harmonics added to the signal, in percent.



5.14.10 Mix

Controls the amount saturation added to the main signal.

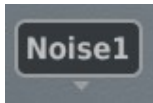


5.15 Thermal noise emulation



CS-5501 provides a module to emulate thermal noise of analogue channel strips.

5.15.1 Effect module selector



Select effect module from drop-down menu

5.15.2 Off/On



Enables the module.

5.15.3 Solo



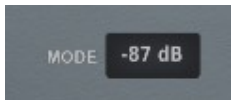
Solos the module. Shift mouse click resets solo states of all modules.

5.15.4 Stereo placement



The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.15.5 Noise mode



The module provides several noise profiles: -87/-114dB and dither 16/24 bit.

5.16 Clip

CS-5501 provides a module to clip the signal.



5.16.1 Effect module selector



Select effect module from drop-down menu

5.16.2 Off/On



Enables the module.

5.16.3 Parameter link



Links parameter of limiter 1 and 2

5.16.4 Solo



Solos the module. Shift mouse click resets solo states of all modules.

5.16.5 Stereo placement



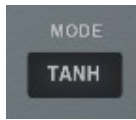
The stereo placement of the effect can be changed to stereo/left/right/mid/side.

5.16.6 Ceiling



Ceiling sets the clip level of the module. The LED indicates activity of the clip processor.

5.16.7 Clip mode



Mode selects various clip modes: tanh (default), hard, sinus and quintic clipping.

5.17 Plugin menu



The plugin menu provides various settings and functions, not found in the GUI.

5.17.1 About

Info about the plugin.

5.17.2 Open manual

Opens manual

5.17.3 Change log

Opens online change log information.

5.17.4 Check for updates now

Contacts TBProAudio server for plugin updates.

5.17.5 Check for updates automatically

Checks automatically for updates.

5.17.6 Activate plugin

Opens activation screen.

5.17.7 Tooltips

Toggles GUI hints.

5.17.8 Reset GUI Scale

Resets GUI scale to default (100%)

5.17.9 Set Min GUI Scale

Set GUI to minimum GUI scale (50%)

5.17.10 Hide Knob Overly Text

Prevents the display of the parameter value during adjustment if you want to keep it “old-school”.

5.17.11 Dual Meter Calibration

Enables individual calibrations for left and right VU meter.

5.17.12 Enable EQ component tolerances

Enables emulation of components of EQ section (currently experimental)

5.17.13 Force Mono Mode

CS-5501 detects current channel configuration automatically. Some DAWs provide only stereo tracks even for mono audio material. In case you process mono audio on a stereo track enable to save resources.

5.17.14 Fixed GUI Scale

Set GUI to fixed scales

5.17.15 Copy EQ1 settings to EQ2

Copies all EQ1 settings (excluding solo mode and channel mode) to EQ2.

5.17.16 Copy EQ2 settings to EQ1

Copies all EQ2 settings (excluding solo mode and channel mode) to EQ1.

5.17.17 Set smart silence processing globally

Propagates smart silence processing setting to all CS-5501 instances (including SSP custom threshold). This functions only if all CS-5501 instances are in the same process space. Please consult the DAW manual for more information.

5.18 Background themes



Changes background theme.

5.19 Undo/redo



Undo and redo of parameter changes.

6 ABLM Lite

ABLM Lite is a **perceptual A/B loudness matching** algorithm to help you avoid the pitfall of 'louder is better', so you can evaluate the impact of the plugin on your incoming and outgoing audio signal at equal loudness.

When you engage ABLM Lite, the algorithm analyzes the incoming signal and compares it to the outgoing signal via its RMS values and applies an automatic gain adjustment so you can focus on the plugin settings and what they are actually doing to your audio, without being distracted by loudness differences.

Please to note that ABLM Lite limits the gain adjustment to +/- 12dB to avoid gain overshoots.

ABLM Lite lets you automatically minimize the loudness either quickly (mode fast) or gently (mode slow).

The “target” symbol top right of the fader sections freezes the last ABLM Lite gain and switches ABLM Lite off. This function prints the last ABLM Lite gain settings to the gain structure of CS-5501.

The small yellow LED indicates if ABLM Lite freeze gain is active. Click on the “target” symbol sets freeze gain to 0.0 dB.

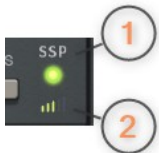


ABLM Lite is an automatic, simplified algorithm to help your workflow, based on our more advanced dedicated ABLM plugin, which allows perceptual loudness matching of third party plugins and even complete plugin chains. ABLM also offers more advanced options, including advanced measurement modes and snapshots.

For the more advanced features of ABLM, please see www.tbproaudio.de.

7 Smart silence processing (SSP)

Smart silence processing reduces CPU if silence is processed.



- 1) Click to set SSP threshold to either -186/-138/-90dBFS. This corresponds to SNR of 32/24/16Bit. Select custom threshold for user defined SSP threshold. The SSP icon indicates the processing state.
- 2) Click to set SSP threshold based on current loudness.

8 Demo mode versus Registered Mode

In demo mode (without activation) the plug-in mutes audio every 90 seconds for a short period. This could be circumvented by clicking on the "TBProAudio" logo within 90 seconds.

9 Plugin activation



The plugins needs to be registered/activated to remove demo restrictions. Please go to www.tb-proaudio.de to purchase the activation key. After purchase you will receive an email from TBProAudio with either the (zipped) activation key file or the activation key in text form. Go to the plugin menu->Activate plugin. Please follow the steps described here: <https://www.tbproaudio.de/support/productactivation>. After successful activation the key symbol shown in the GUI appears in golden colour.

10 Conclusion

Special thanks go to Crimson Merry who designed the GUI and Taviq Mastering who gave constant valuable input to improve CS-5501.

If you have any questions or suggestions just let us know. And have fun with our tools.

Your team from TBProAudio :-)