

AB-Loudness Match

Manual



by TBProAudio 2020

1 Introduction

Welcome to AB_LM, a gain control which enables level matched and sample accurate AB comparison of FX chains.

We at TBProAudio found us very often in mixing or mastering situations where we need to quickly identify the contribution of a certain plug-in (FX) or even a complex FX chain to the sound. Most DAWs can easily enable/disable (AB) single plug-ins or even whole FX chains, but in most case there is an audible loudness difference between both cases.

In order to compare the impact of a plug-in chain objectively the loudness of the incoming signal should match with the loudness of outgoing signal.

Comparing the plug-in effect at equal loudness levels avoids the "louder is better" - pitfall.

In fact AB_LM compares constantly the pre and post-FX loudness and displays the gain difference. Based on this information you can either set the match-gain manually or let AB_LM do this automatically.

AB_LM is based on the free AB Level Matching JSFX for Reaper, which should demonstrates the superior functionality of the scripting language JS in Reaper. Many thanks to the developer from Cockos!

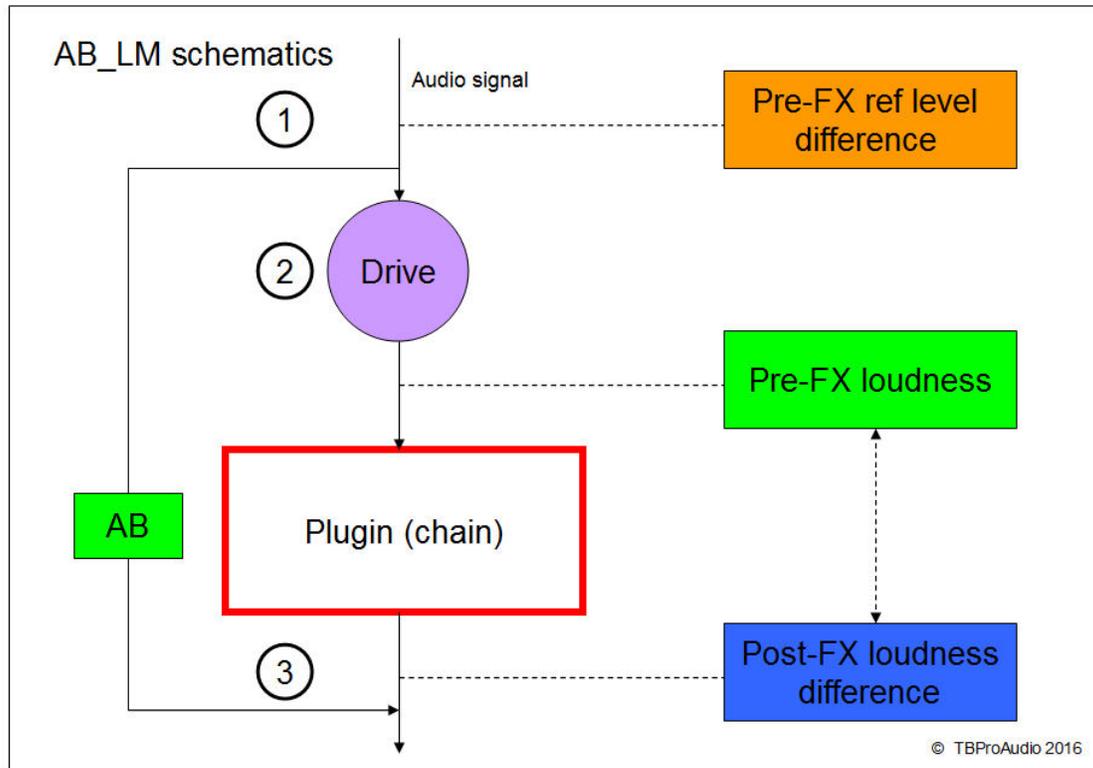
2 Features

AB_LM offers following features:

- match pre and post-FX loudness
- match pre-FX loudness with reference level
- 3 loudness match modes: manual, auto and gain stage
- delta signal monitoring
- FX chain drive
- up to 256 sender/receiver pairs including auto channel link support
- automatic latency measurement/compensation
- 6 measurement modes: RMS Sum, RMS Avg, EBU R128 SL, EBU R128 ML, VU, Max Peak
- adjustable RMS measurement window
- control several AB_LM instances simultaneously
- bypass complete AB_LM pair
- 4 snapshot slots
- tool tips
- very CPU friendly
- large and easy to use GUI

3 Design

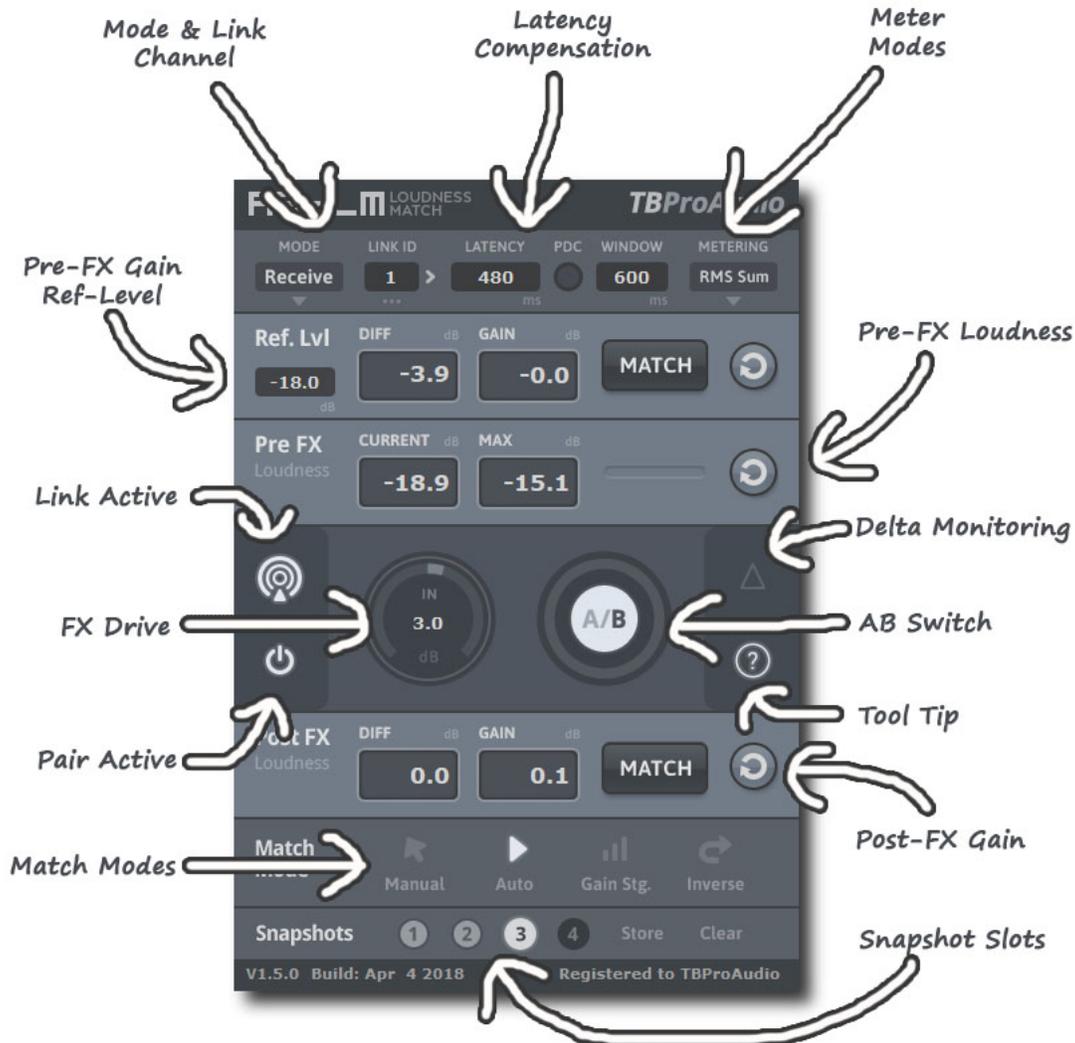
AB_LM consists of 3 gain stages:



1. The incoming signal is (optionally) leveled to a certain reference level. This keeps your ears fresh and balanced, even if you work with different audio material over a longer time period.
2. This stage changes (optionally) the signal gain fed into plug-in chain.
3. This stage matches the pre and post-FX loudness levels.

The AB button toggles seamless and loudness matched between pre and post-FX signal.

4 Overview



Mode & Link Channel

Sets the mode of the plug-in, either Sender or Receiver and the link channel for the communication. Sender is placed before the plug-in(s) which should be AB level matched, Receiver is inserted after. Use the ">"-button (Link) to quickly set next (free) sender/receiver channel.

Left mouse click on the control open the channel menu, right click an value entry box. The menu helps you find a new channel either for the sender or receiver.

Each entry has a number and the info if the number is already used by a sender (S) or receiver (R) instance. Grayed entries are not selectable.

Starting with V1.7 the procedure of finding right channel link id has changed: For each new AB LM instance just click on the ">"-button (auto link).

If there are only linked pairs, the new instance will get a sender with the next free channel link id. If the last instance was a sender, the next new instance will get a receiver with the matching channel link id.

Latency Compensation

Some plug-ins add latency to the plug-in chain. For a sample-exact AB loudness comparison audio streams need to be synchronized. This can be done automatically (just press PDC button and wait 1-2 seconds) or manually by entering the latency value (in samples).

Match Modes

AB_LM lets you match the loudness either manually, or automatically. In addition AB_LM can operate in pure gain staging mode.

Auto: Matches automatically the loudness of pre and post-FX signal

Manual: Matches the loudness of pre and post-FX signal by pressing the match button (PostFX Diff/Gain)

The match gain is added after FX chain. If "inverse" is enabled match gain is added before FX chain.

Gain (Gain staging): this mode works differently. There is no loudness match of pre and post-FX signal. The PreFX gain and additional FX drive gain is just removed from the audio stream right after the FX chain, for "pure" gain staging purposes.

Pre-FX Diff/Gain

This meter shows the loudness difference of pre-FX signal and the reference level. The match button lets you set the additional pre-FX gain based on the loudness difference.

Pre-FX Curr/Max

This meter shows the current and maximum loudness of the audio stream just before the plug-in(s). Many plug-ins work best at a certain loudness level (e.g. -18 dBFS)

Post-FX Diff/Gain

This meter shows the loudness difference of pre and post-FX signal. The match button lets you set the additional post-FX gain (match mode "Manual") based on the loudness difference. Match mode "Auto" does this automatically.

Snapshot Slots

AB_LM provides 4 snapshot slots to store and recall settings for FX drive and Post-FX gain. So you can test your plug-in chain with different gain levels, all loudness matched.

FX Drive

This parameter adjusts the additional pre-FX gain.

AB Switch

This button lets you seamless switch between pre and pre-FX audio signal.

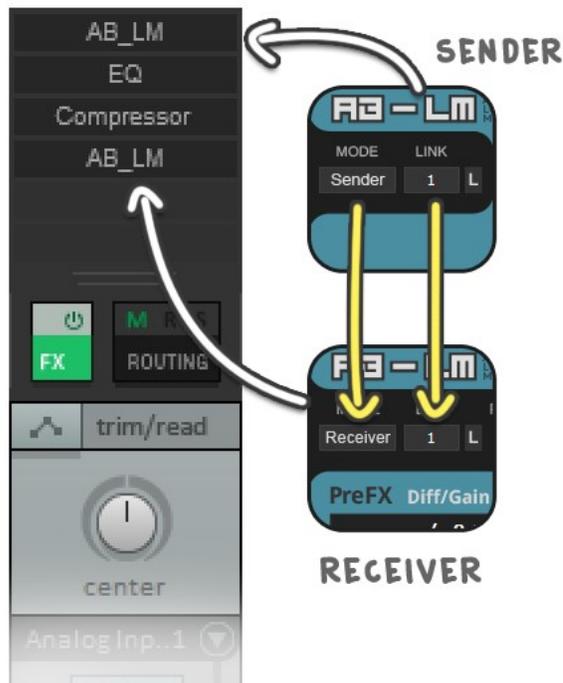
5 How to use

You can setup a plug-in (chain) controlled by AB_LM very easily with 3 steps:

Step 1: Insert AB_LM before your plug-in (and configure it as "Sender" and select link 1)

Step 2: Insert any plug-in, e.g. EQ, compressor etc.

Step 3: Insert AB_LM after your plug-in (and configure it as "Receiver" and select link 1)



Now start playing, modify the EQ or any other plug-in, monitor the gain difference, press the match button and later the FX AB button.

6 Minimum System Requirements

- Windows XP SP3 or newer
- Mac OS X 10.9 or newer
- Win: 32/64 Bit VST, 32/64 Bit VST3, 32 Bit RTAS, 32/64 Bit AAX
- OS X: 32/64 Bit VST, 32/64 Bit VST3, 32/64 Bit AU, 32 Bit RTAS, 32/64 Bit AAX
- Tested with: Cockos Reaper, Steinberg Cubase/Nuendo/Wavelab 6/7/8/9/10, FL Studio 12.x/20.x, PT10/12/2018, Reason 9.5/10, Studio One, Ableton Live

7 Plug-in Controls

7.1 Mode & Link

Sets the operation mode of AB_LM: either Sender or Receiver. Up to 256 link channels can be set. Use the ">"-button to set next free sender or receiver mode and the next free sender or receiver channel.

Per link channel only one pair is allowed: Sender 1 - Receiver 1, Sender 2 - Receiver 2 etc. The pair should be placed on one track, connections across tracks may not work. Pairs could be nested.

Note: Yellow "satellite" and "receiver" icons indicate working link.

7.2 PDC & Latency

Press the PDC button to start the automatic latency measurement. Or enter the latency value manually (up to 176.000 samples).

Note: Some DAWs require "play" mode in order to send audio through the plug-ins.

Note: The quality of latency measurement is increased by setting the effect of the FX chain initially as neutral as possible.

7.3 Metering Mode

Either pure **RMS Sum** (Channel summed RMS), **RMS Avg** (Channel averaged RMS), **EBU R128-2014 ML** (momentary loudness, 400ms) or **EBU R128-2014 SL** (short term loudness, 3000ms). Both EBU R128 modes do pre-filtering according to EBU R128-2014 specification. Additionally **VU metering** can be used (300ms raise and fall time), 0VU = -18dBFS

Max Peak mode uses the current max peak level as loudness level. Please reset PRE-FX loudness values if you change FX parameters of sandwiched plugins.

7.4 Window

This parameter sets the loudness measurement (RMS) window (in ms) (RMS Sum/Avg only).

Note: Too small values may cause audible gain changes in match mode "auto".

7.5 Ref level

If you work with calibrate audio systems set the loudness reference level (in dBFS or VU) for the incoming signal.

7.6 Pre FX: Diff, Gain Level

The meter displays the loudness difference of incoming signal level and reference level (in dB or VU). Press the match button to balance the current loudness with the reference level (ctrl mouse click balances the max loudness with reference level, shift mouse click all instances). Click on the reset button resets the measurement (shift click for all AB_LM instances).

7.7 Pre FX: Cur, Max Loudness Level

The meter displays the current and maximum loudness (in dBFS or VU) of the signal fed into FX chain (Pre-FX loudness). Click on the reset button resets the measurement (shift mouse click for all AB_LM instances).

7.8 Active

This button/LED lets you activate/deactivate the AB_LM pair. Shift mouse click activates/deactivates all instances.

7.9 Drive FX

Increases/Decreases gain of incoming signal fed into FX chain. Shift mouse drag affects all instances.

7.10 AB FX

This button/LED lets you switch between pre and post-FX signal.

Note: latency needs to be set correctly in order to get a sample-exact comparison. Shift mouse click toggles all instances.

7.11 Delta Monitoring

Monitors the difference between output and input signal depending on match modes.

e.g. in match mode “auto” only loudness changes of the sandwiched FX are audible.

If you need to monitor also static loudness changes use match mode “manual” and set Post-FX gain to 0 dB (by clicking on the reset button). Shift mouse click toggles all instances.

7.12 Disable automatic update of gain difference

During match mode “Auto” AB_LM updates by default internally the last gain difference value. This helps to get the right gain value during project load phase.

But in some DAWs this could create many undo data. So use the switch to enable/disable automatic storage feature. Shift mouse click toggles all instances.

7.13 Tool tips

Toggles tool tips.

7.14 Post FX: Diff, Gain Level

The meter displays the loudness difference of pre and post-FX signal (in dB or VU).

Depending on match mode you can balance the gain difference manually (match mode “Manual”) or automatically (match mode “Auto”) with the match button (shift mouse click for all instances with match mode “Manual”). Click on the reset button resets the measurement (shift mouse click for all AB_LM instances).

7.15 Match Mode

Manual: pre/post-FX gain difference is balanced by a click on the match button

Auto: pre/post-FX gain difference is balanced by AB-LM automatically

Gain: pre-FX gain difference (compared to reference level) is balanced by a click on the match button

7.16 Inverse

Inverse Match Mode: if enabled match gain is applied before FX chain (match mode “Manual” and “Auto” only)

7.17 Snapshots

4 slots keep the settings for FX drive and post-FX gain.

7.18 Global controls

The following parameter can be controlled across all AB_LM instances by holding the left shift key:

- FX Drive

- AB FX
- Delta Monitoring
- Active/Inactive
- Disable automatic update of gain difference

7.19 Plugin info

Click on the AB-LM logo to get information about the plugin, open the online manual and open the change log.

8 Demo mode versus Registered Mode

In demo mode (without registering) 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 Registration/Activation

This plugin must be registered and activated in order to be fully functional. You can purchase the license key here: <http://www.tb-software.com/tbproaudio>.

After purchase, you will receive the license key packed in a zip file by email. Unzip the license file to a suitable location on your PC (e.g. desktop). The license file is called "product name.license". Add the plug-in to any track in your DAW, click on the text "Demo: Click here to activate it" and select the license file. Remove the plug-in in your DAW and add it again. The GUI now says "Registered to your name".

10 GUI Design

All credits for the GUI design go to Crimson Merry (<http://twitter.com/twittersaya>). He did an incredible job by designing this clearly structured and easy to read user interface. Thank you!

11 Conclusion

So finally if you have any questions or suggestions just let us know. And have fun with our tools and visit us here: <http://www.tb-software.com/TBProAudio/index.html>

Your team from TBProAudio :-)