AB-Loudness Match

Manual

by TBProAudio 2017

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!

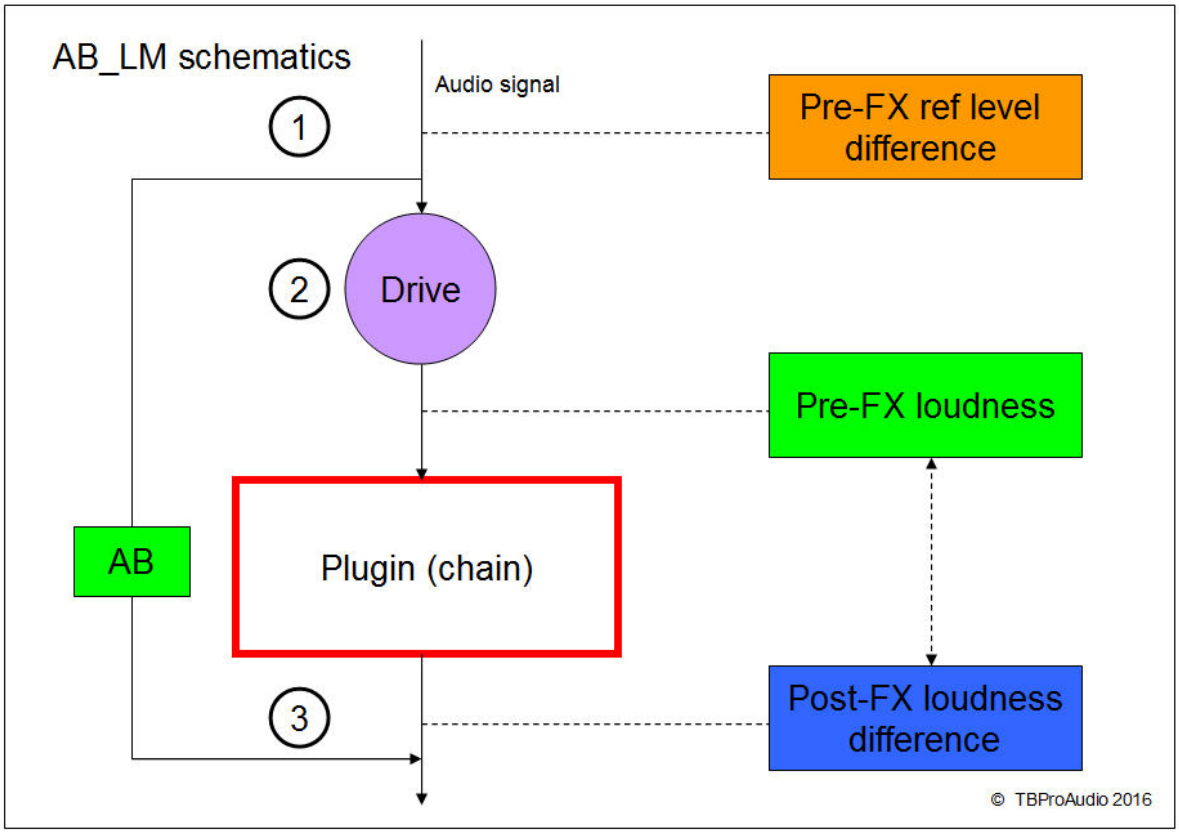
2 Features

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
- FX chain drive
- up to 256 sender/receiver pairs including auto channel link
- automatic latency measurement/compensation
- 5 measurement modes: RMS Sum, RMS Avg, EBU R128 SL, EBU R128 ML, VU
- adjustable RMS measurement window
- bypass complete AB_LM pair
- 4 snapshot slots
- very CPU friendly
- large and easy to use GUI

3 Design

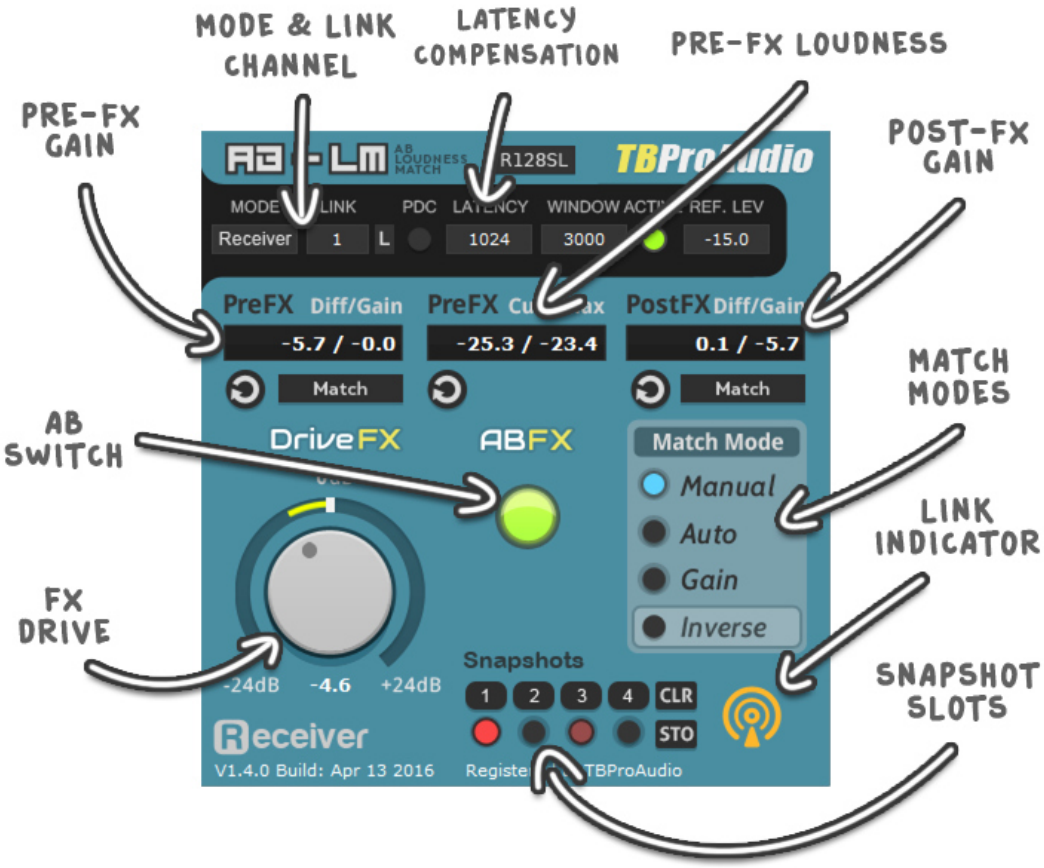
AB_LM consists of 3 gain stages:



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 switches 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 "L"-button (Link) to quickly set next highest (free) sender/receiver channel.

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).

Pre-FX Loudness
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 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 current loudness difference. Match mode "Auto" does this automatically.

Match Modes
AB-LM lets you match the loudness either manually, or automatically. The match gain is added after FX chain. If "inverse" is enabled match gain is added before FX chain.
The mode "Gain Stage" works differently: 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.

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.

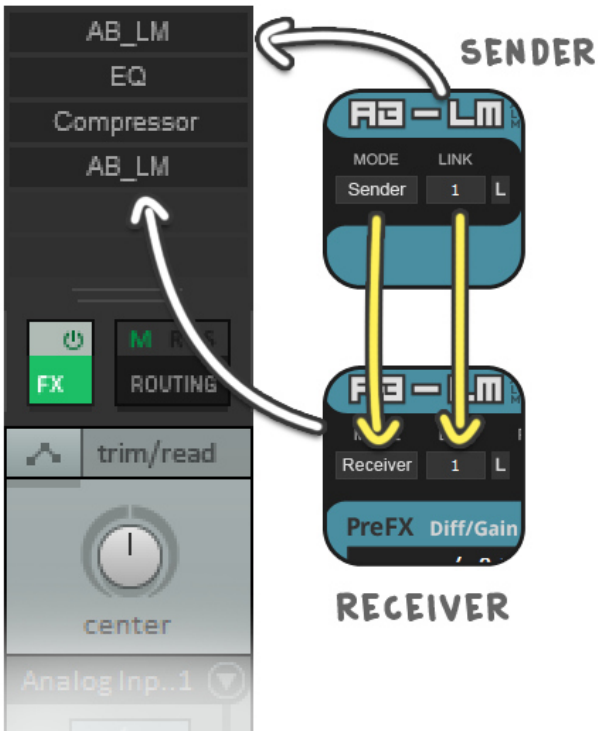
AB Switch
This button lets you seamless switch between pre and pre-FX audio signal.

Pre-FX Gain
This meter shows how close the loudness of the incoming signal is matched with a certain reference level. Many engineers work with loudness calibrated audio systems.

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 10.5 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, FL Studio 12.x, PT10/12
- All sample rates

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 "L"-button to set next highest (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.

<u>Built in auto channel link:</u>
AB_LM comes with "auto channel link" which supports you to easily setup a larger number of plug-in-in pairs without manual interaction. Due to the nature of DAW plug-ins and its internal parameter management it works well under certain conditions:

- AB_LM should be setup in pairs e.g. Sender1, Receiver1, Sender2, Receiver2.
- AB_LM selects plug-in mode (Sender/Receiver) and next free link channel automatically if you create a new instance (insert plug-in).
- If you copy a track with plug-in pairs, the link channels on the new track are renumbered based on next free channel. Even complex and nested AB_LM pairs are copied and all channel links are renumbered in the right way.

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 Measurement Mode

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

7.4 Window

This parameter sets the loudness measurement (RMS) window (in ms) (only if measurement mode is set to RMS Sum or RMS Avg).
Note: Too small values may cause audible gain changes in match mode "auto".

7.5 Active

This button/LED lets you activate/deactivate the AB_LM pair.

7.6 Ref level

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

7.7 Pre FX: Diff/Gain

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 (shift mouse click balances the max loudness with reference level)

7.8 Drive FX

Increases/Decreases gain of incoming signal fed into FX chain.

7.9 Pre FX: Cur/Max

The meter displays the current and maximum loudness (in dBFS or VU) of the signal fed into FX chain.

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.

7.11 Post FX: Diff/Gain

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 by hand, or let AB_LM do it automatically.

7.12 Match Mode

Manual: gain difference is balanced by a click on the match button
Auto: gain difference is balanced by AB-LM automatically
Gain Stage: PreGain and Drive FX gain are compensated after FX chain

7.13 Inverse

Inverse Match Mode: if enabled match gain is applied before FX chain.

7.14 Snapshots

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

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 "AB_LM" logo within 90 seconds.

9 GUI Design

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

10 Conclusion

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

Your team from TBProAudio :-)