LA xLimit IV

Manual

TBProAudio 2025

1   Introduction

Welcome to LA xLimit IV, a look ahead, wideband linked-stereo limiter including ISP (inter sample peak) detection and oversampling.
LA xLimit IV is the successor of LA xLimit II, our very popular look ahead limiter. It offers more control over transients and adaptive release curves. It also adds a second limiter stage for better performance in ISP detection mode.
The goal of the design was to cover a broad range of limiting applications in today's mixing and mastering situations with strong focus on *low aliasing*.

2 Features
LA xLimit IV offers following features:

- state of the art low aliasing look ahead limiter design
- freely adjustable limiter character
- detailed transient control
- freely adjustable adaptive release curves
- level detection modes: peak and ISP based on ITU BS1770.4
- RMS, EBU R128 and DIAL (Dialog loudness measurement)
- "real" oversampling, up to 8x
- stereo link
- built-in clipper, can be switched off
- drive mode
- adjustable latency modes
- unity gain and delta monitor modes
- DC blocker
- preset management
- Mid/Side processing mode
- side chain support
- large and accurate live meters
- comprehensive level display including infinity mode
- all sample rates
- easy to use GUI
- GUI scaling

Note: This plugin adds latency to the audio path, which is usually compensated by the DAW (PDC).

3 Design

LA xLimit IV is specifically designed for mastering, digital editing, multimedia, and any application that requires limiting of the digital signal with top notch quality and lowest aliasing. LA xLimit IV guarantees ultra fast and overshot free response by using advanced look ahead algorithms.

In order to fulfill today's TV, broadcast and music production requirements LA xLimit IV offers True-Peak limiting (ISP) based on ITU BS.1770-4 specification and on top of it up to 8x "real" oversampling. Combined with True-Peak limiting reaches even highest production standards.

LA xLimit IV includes an advanced adaptive release control system which reduces massively artifacts caused by fixed release times. In order to increase limiting sensitivity both stereo channels can be freely linked/unlinked.

After adjusting limiters threshold the maximum peak level of the signal (ceiling) can be set. Once fixed, limiting and re-leveling becomes a very easy process.

LA xLimit IV is designed to be used as last plugin in the processing chain (brick-wall limiting).

LA xLimit IV provides synced measurement of RMS, EBU R128 and DIAL (loudness gating according Dolby Labs reference code, https://www.dolby.com/us/en/technologies/speech-gating-reference-code.aspx). This measurement modes support today's mastering task like delivering according specifications like Alexa, Netflix or AES Streaming.

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

LA xLimit IV is designed to reset all internal measurements if significant parameter changes are made. This keeps all displays updated. LA xLimit IV uses various graphical elements to control the parameters of the plugin:

<u>Value knob:</u>

Mouse click and drag up/down or mouse wheel changes value.
Mouse ctrl click resets value.
Mouse double click or mouse right click opens value input box.

<u>LED-Button:</u>

Mouse click enables/disables function,

<u>Popup menu button:</u>

Mouse click opens popup menu.

6 Plugin Controls

Mouse usage:

Click and drag horizontally changes parameter value
Shift click and drag changes parameter value slower
Ctrl click rests to default value
Double click opens value edit box, finish with enter.

6.1 Plugin menu

Click on the "hamburger" icon to open the info menu: more information about the plugin, online version check access to the online manual, the change log and toggling tool tips.

6.1.1 Low Latency Modes

Mode off: 512 smp: 10.7ms@SR 48kHz (default)
Mode 256: 265 smp: 5.3ms@SR 48kHz
Mode 128: 128 smp: 2.7ms@SR 48kHz
Mode 64: 64 smp: 1.3ms@SR 48kHz
Mode 32: 32 smp: 0.7ms@SR 48kHz
Mode 16: 16 smp: 0.3ms@SR 48kHz

(figures can change if over-sampling is enabled, as over-sampling introduces additional latency)

6.1.2 DC blocker modes

LA xLimit can DC block the signal before it goes into the limiter circuit. The DC blocker offers several center frequencies of the low cut filter (1 Hz to 25 Hz)

6.2 Presets

Preset menu loads and saves user presets. Presets stored to %localappdata%/LAxLimit3 for Windows or /Users/xxx/Library/Application Support/ LAxLimit3 for Mac OSX are imported as user presets. Prev and next button step trough all presets.

6.3 Character

"Character" controls the look ahead time of the limiter. Small values let the limiter use less samples to calculate gain reduction.
0 - 100 %, default 12 %.

6.4 Transients

"Transients" controls how much of the transients are passed to the internal clipping stage. Higher values make the signal more clip.
0 - 200 %, default 0 %.

6.5 Release

Release time controls how fast the limiter recovers to the constant gain after a peak is detected. Depending on application different release times can be used. For track/bus limiting typical values are 25 up to 150 ms. For mastering applications typically 0.5 - 5 ms are used.
0 - 1000 ms, default 1.0 ms.

6.6 Adaptive Release

Adaptive release calculates the best release time every sample for optimum level with minimum artifacts and aliasing effects. For nearly all limiting applications adaptive release will outperform a fixed release time. The adaptive release curve is controlled by parameter "Dynamics".

6.7 Dynamics

"Dynamics" controls the characteristics of the adaptive release curve. Higher values gives less curve elasticity.
0 - 100 %, default 0 %.
Note: Release time control sets the minimum release time in adaptive release mode.

6.8 Stereo Link

Set to 100 % gain reduction is calculated from highest peak on both stereo channels, set to 0 % both channels are processed fully independent.
0 - 100 %, default 100 %

6.9 Drive mode

If drive mode is "off", LA xLimit IV uses threshold and ceiling as before (normal L2 mode). In drive mode "on" drive feeds additional gain into the limiter and limits the signal at the ceiling level. Dive mode simplifies the loudness adjustment by unlinking ceiling (max Peak/TP) and gain increase.

6.10 Threshold/Drive

Calibrated in dBFS.
In drive mode "off" threshold sets the minimum level where the limiter starts to act. If signal is below no limiting is done. Using Alt-key with mouse changes threshold as well.
-60 - 0 dB, default 0.0 dB
In drive mode "on" drive increases the gain fed into the limiter.
0 - 36 dB, default 0.0 dB

Limiter activity can be monitored by gain reduction (GR) meter.

6.11 Ceiling

Calibrated in dBFS. Ceiling sets the maximum level output signal can reach. If ISP is selected this is the maximum True-Peak level.

6.12 Link Threshold/Ceiling

Toggle link of threshold and ceiling, if drive mode is off.

6.13 True Peak mode

True peak mode enable ISP (inter sample peak) detection.
ISP please look here for further information:
http://en.wikipedia.org/wiki/Audio_normalization).
ISP detection of LA xLimit IV is based on the ITU BS.1770-4 specification and adapted for other sample rates than 48.000 Hz and internal oversampling.

6.14 Oversampling

Incoming signal could be oversampled up to 8 times. As LA xLimit IV uses highest quality up/down-sampling algorithms for *low aliasing* operation significantly more CPU resources are used. Additional latency is introduced due to usage of linear phase filter.

6.15 Monitor Mode

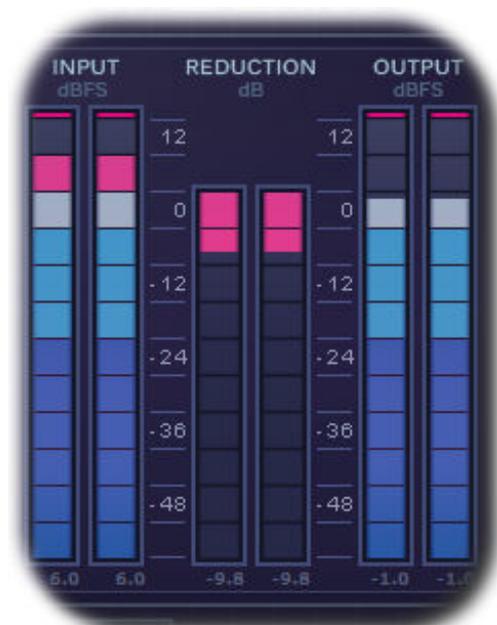Off, unity gain (removes threshold and ceiling from output signal) and delta (input minus output signal)

Mid/Side Mode

Toggle mid/side processing mode

6.16 Clip Mode

Toggle hard/soft/off clip mode

6.17 Meter

Meters for input signal (L/R Input), output signal (L/R Output) and gain reduction (L/R GR). In ISP mode True-Peak values (dBTP) are displayed otherwise peak values (dBFS).

LED signal meter range is from -60 to +12 in 3dB steps.
LED gain reduction meter is from -60 to 0 in 3dB steps.
The values just below the meters show the maximum value.
If signal reaches 0 dBFS/dBTP the top LED lights red.
Mouse click on one of the meters resets max. values.

6.18 Measurement Mode

OFF, RMS, EBU ML, EBU SL, EBU IL and DIAL (gated integrated loudness).
DIAL measurement 44100/48000Hz sample rate only.

6.19 Sync

Toggle measurement-sync with DAW (start/stop). If "on", measurement is reset before DAW starts. And ends as soon DAW stops.

6.20 Reset

Resets loudness measurement.

6.21 SC (side chain)

The SC button uses the side chain to trigger the limiter detection path, instead of the normal input signal. This can be very useful for stem mastering, when you need to deliver individual stems that have been processed with the exact same limiting as the original master.

7 Level display

V4.1 provides a comprehensive level display of the limiting process including infinity mode:

1) Enables level display
2) Selects long term measurement method: RMS/EBU ML/EBU SL/EUB IL/Dial IL
3) Displays current and max values (except EBU IL(IL and SL) and Dial (IL and SL)
4) Enables DAW synced measurement and level display
5) Reset measurement and level display
6) Select speed of level display update: 10/20/50/100ms and infinity mode.(*)
7) Select range of the magnitude display: -12/-18/-24/-48dB
8) Gain reduction level curve
9) Output level curve
10) Input level curve
11) Max level of RMS/EBU ML/EBU SL measurement. Current SL level of EBU IL and Dial measurement
12) Current level of RMS/EBU ML/EBU SL/EBU IL and Dial IL measurement

Click anywhere on the level display screen to see the level under the cursor.
(*) 10 ms update speed means that every GUI image pixel represents 10 ms of the audio signal, so in total about 7 seconds. Same for 20, 50 and 100 ms.

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

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

Your team from TBProAudio :-)