Avid Pro Limiter Guide

Documentation Feedback

At Avid, we are always looking for ways to improve our documentation. If you have comments, corrections, or suggestions regarding our documentation, email us at *techpubs@avid.com*.

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Chapter 1: Introduction

Avid Pro Limiter is an AAX format plug-in (DSP, Native, and AudioSuite) that provides true peak limiting. Pro Limiter provides "brick-wall" limiting and metering designed to prevent output clipping and distortion, without necessarily coloring the sound.

Pro Limiter supports 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz sample rates. Pro Limiter also supports mono, stereo, and greater-than-stereo multichannel formats up to 7.1.

⚠ *Greater-than-stereo formats are only available with Pro Tools HD and Pro Tools with Complete Production Toolkit.*

This guide provides information on installing and using the Avid Pro Limiter plug-in for Pro Tools sessions.

For general information on using plug-ins with Pro Tools, see the *Pro Tools Reference Guide*.

System Requirements and Compatibility

To use Avid Pro Limiter, you need the following:

- An iLok USB Smart Key
- An iLok.com account for managing iLok licenses
- A qualified Pro Tools system (version 10.3.3 or higher)

Avid can only assure compatibility and provide support for hardware and software it has tested and approved.

For complete system requirements and a list of qualified computers, operating systems, hard drives, and third-party devices, visit:

www.avid.com/compatibility

Registering Plug-Ins

Your plug-in purchase is automatically registered when you activate your iLok license (see "Authorizing Plug-Ins" on page 5).

Registered users are eligible to receive software update and upgrade notices.

For information on technical support, visit www.avid.com/support.

Working with Plug-Ins

Besides the information provided in this guide, refer to the *Pro Tools Reference Guide* for general information on working with plug-ins, including:

- Inserting plug-ins on tracks
- Using clip indicators
- Navigating the Plug-In window
- Adjusting plug-in controls
- Automating plug-ins
- Using plug-in presets

Conventions Used in This Guide

Pro Tools guides use the following conventions to indicate menu choices and key commands:

Convention	Action
File > Save	Choose Save from the File menu
Control+N	Hold down the Control key and press the N key
Control-click	Hold down the Control key and click the mouse button
Right-click	Click with the right mouse button

The names of Commands, Options, and Settings that appear on-screen are in a different font.

The following symbols are used to highlight important information:

User Tips are helpful hints for getting the most from your Pro Tools system.

Important Notices include information that could affect your Pro Tools session data or the performance of your Pro Tools system.

Shortcuts show you useful keyboard or mouse shortcuts.

Cross References point to related sections in this guide and other Pro Tools guides.

About www.avid.com

The Avid website (www.avid.com) is your best online source for information to help you get the most out of your Pro Tools system. The following are just a few of the services and features available.

Product Registration Register your purchase online.

Support and Downloads Contact Avid Customer Success (technical support); download software updates and the latest online manuals; browse the Compatibility documents for system requirements; search the online Knowledge Base or join the worldwide Pro Tools community on the User Conference.

Training and Education Study on your own using courses available online or find out how you can learn in a classroom setting at a certified Pro Tools training center.

Products and Developers Learn about Avid products; download demo software or learn about our Development Partners and their plug-ins, applications, and hardware.

News and Events Get the latest news from Avid or sign up for a Pro Tools demo.

Chapter 2: Installation and Authorization

Installing Plug-Ins for Pro Tools

The installer for your plug-in can be downloaded from the Avid Store (shop.avid.com) or through your my.avid.com account. Plug-Ins can also be purchased retail, in which case the included activation card provides the necessary information for downloading, installing, and authorizing your plug-in (www.avid.com/activation).

📑 *For more information about Avid audio plug-ins, visit www.avid.com/plugins.*

To install a plug-in:

1 Download the installer for your computer platform from www.avid.com. After downloading, make sure the installer is uncompressed (.dmg on Mac or .ZIP on Windows).

2 If Pro Tools is running, quit Pro Tools.

3 Locate and double-click the plug-in installer application.

4 Follow the on-screen instructions to complete the installation.

5 When installation is complete, click Quit (Mac) or Finish (Windows).

When you launch Pro Tools, you are prompted to authorize your new plug-in.

Authorizing Plug-Ins

Avid Pro Tools plug-ins are authorized using the iLok USB Smart Key (iLok), manufactured by PACE Anti-Piracy.

iLok USB Smart Key

An iLok can hold hundreds of licenses for all of your iLok-enabled software. Once a license for a given piece of software is placed on an iLok, you can use the iLok to authorize that software on any computer.

⚠ *An iLok USB Smart Key is not supplied with plug-ins or software options. You can use the iLok included with certain Pro Tools systems or purchase one separately.*

Once you have purchased your software from the Avid Store or entered your activation code online, an authorization license for your software is posted to your iLok account. Authorize your software by downloading the license from your iLok account to your iLok USB Smart Key.

📑 *For more information, visit the iLok website (www.iLok.com).*

To download the license for your software to your iLok:

1 If you don't already have an iLok account, visit www.ilok.com to sign up for one.

2 Log in to your iLok.com account at www.ilok.com.

3 Follow the online instructions to transfer the license from your iLok account to your iLok USB Smart Key.

Removing Plug-Ins

If you need to remove a plug-in from your Pro Tools system, follow the instructions below for your computer platform.

Mac OS X

To remove a plug-in:

1 Locate and open the Plug-Ins folder on your Startup drive (Library/Application Support /Avid/Audio/Plug-Ins).

2 Do one of the following:

• Drag the plug-in to the Trash and empty the Trash.

• Drag the plug-in to the Plug-Ins (Unused) folder.

Windows

To remove a plug-in:

1 Choose Start > Control Panel.

2 Click Programs and Features.

3 Select the plug-in from the list of installed applications.

4 Click Uninstall.

5 Follow the on-screen instructions to remove the plug-in.

Chapter 3: Pro Limiter

Avid Pro Limiter is an AAX plug-in (DSP, Native, and AudioSuite) that provides "brick-wall" limiting and metering. Pro Limiter is a true peak limiter designed to prevent output clipping and distortion without necessarily coloring the sound.

Use Pro Limiter to ensure that your mix output never exceeds digital 0 dB when hitting the digital-to-analog converters on your audio interface.

Pro Limiter plug-in

Metering

Pro Limiter uses sample peak meters for Input and Output signals.

The Peak Hold value is displayed numerically at the top of the meter and the Peak Hold indicator appears as a thin orange line in the meter. This provides highly accurate visual metering correlation with the audio signal.

Input and Output meters use the following color coding:

**Dark Blue** Indicates nominal levels from –90 dB to –20 dB.

Light Blue Indicates pre-clipping levels, from –20 dB to 0 dB.

Yellow Indicates full scale levels from 0 dB to +6 dB.

Gain Reduction meters are orange for the entire dynamic range displayed.

Input

The Input section provides input metering and controls for adjusting the level of the input signal and the display of the Input meters.
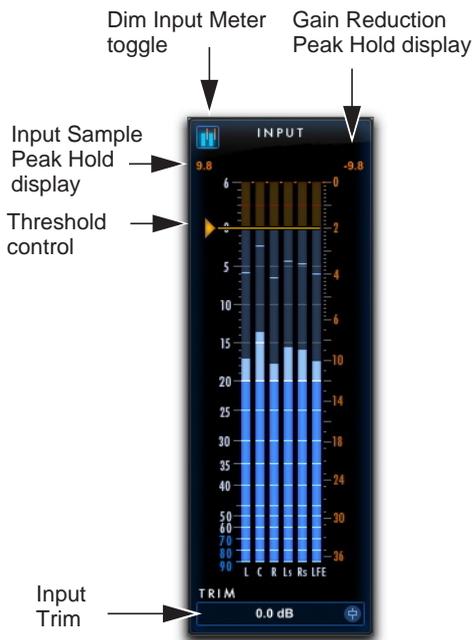
Input section with Meters

Input Trim

The Input Trim control sets the input gain of the plug-in before processing, letting you boost or attenuate gain at the plug-in input stage.

To trim the level of the input signal, do one of the following:

- Click in the Input Level field to type a value (–30.0 dB to +30.0 dB).

- Click the Input Trim control and drag up or down to adjust the Input Trim setting.

Dim Input Meter Toggle

Pro Limiter provides a Dim Input Meter option that dims the input meters while highlighting the attenuation meters. This lets you visually focus more on the gain reduction applied rather than on the incoming signal levels.

To toggle the Dim Input Meter option on or off:

- Click the Dim Input Meter toggle in the upper-left corner of the Input section.

Input and Gain Reduction Peak Hold Displays

Pro Limiter displays the Input Sample Peak Hold value (in dB) at the upper left corner of the Input meters and the Gain Reduction Peak Hold value (in dB) at the upper right corner of the Input meters.

Input Sample Peak Hold Display Shows the last greatest sample peak value from the input signal (on any channel).

Gain Reduction Peak Hold Display Shows the last greatest attenuation value applied to the input signal.

To reset either the Input or Gain Reduction Peak Hold display value:

- Click the display value you want to reset.
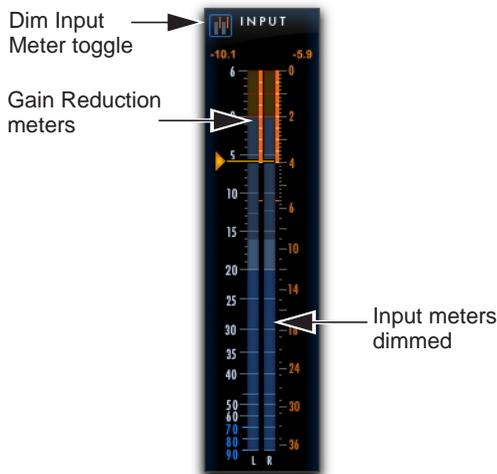
Input Meters

The Input meters show peak signal levels before processing. The Input meter scaling is shown on the left side of the Input meters (from –90 dB to +6 dB).

Gain Reduction Meters

The Gain Reduction meters are interleaved with the Input meters. Gain Reduction meters show the amount of gain reduction applied to the Input signal. The gain reduction amount varies depending on the level of the Input signal, as well as the Threshold and Character settings.

The Gain Reduction meter scaling is shown on the right side of the Input meters (from 0 dB to –36 dB).

To better see the Gain Reduction meters, you can dim the Input meters (see "Dim Input Meter Toggle" on page 8).

Gain Reduction meters shown with Input meters dimmed

Output

The Output section provides output metering and controls for adjusting the level of the output signal.
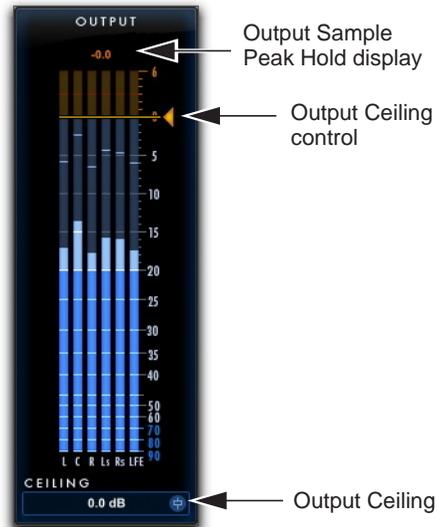
Output section with Meters

Output Meters

The Output meters show peak signal levels after processing. The Output meter scale is shown on the right side of the Output meters (from –90 dB to +6 dB).

Output Sample Peak Hold Display

Pro Limiter provides a numerical display for the output sample peak hold value (in dB) above the output meters. To reset the value, click it.

Pro Limiter Controls

Pro Limiter provides controls for setting the Threshold, Ceiling, Character (soft-saturation limiting), and Release time.

Threshold

The Threshold control sets the level an input signal must exceed to trigger limiting. Signals that fall below the Threshold setting are unaffected.

To adjust the input threshold, do one of the following:

- Click in the Threshold field to type a value (–30 dB to 0 dB).

- Click the Threshold control and drag up or down.

- Click the Threshold control on the Input meters and drag up or down.

Ceiling

The Ceiling control sets the maximum output level of the audio signal.

To adjust the output ceiling, do one of the following:

- Click in the Ceiling field (either below the Ceiling control or below the Output meters) to type a value (–30 dB to 0 dB).

- Click the Ceiling control and drag up or down.

- Click the Output Ceiling control on the Output meters and drag up or down.

Shift-click and drag either the Ceiling control or the Threshold control to link both controls and adjust them to match the same value.

Character

The Character control adds soft-saturation processing with no additional gain before applying limiting.

Release

The Release control sets the length of time it takes to cease limiting after the input signal crosses the threshold.

Release times should be set long enough that if signal levels repeatedly rise above the threshold, the gain reduction "recovers" smoothly. If the release time is too short, the gain can rapidly fluctuate as the limiter repeatedly tries to recover from the gain reduction. If the release time is too long, a loud section of the audio material could cause gain reduction that continues through soft sections of program material without recovering.

When the Auto Release option is enabled, the Release control is overridden and the Release value display is grayed out.

Channel Linking

Pro Limiter provides four different options for determining how limiting processing is applied to greater-than-stereo multi-channel formats.

Stereo Pairs When selected, limiting is only applied to the Left and Right stereo pairs only when either the Left or Right incoming signal exceeds the Threshold setting. Similarly, limiting is only applied to the Left Surround and Right Surround stereo pairs only when either the Left Surround or Right Surround incoming signal exceeds the Threshold setting. The processing of the Center channel (if present) is applied separately only when the incoming signal on for the Center channel exceeds the Threshold setting.

All (w/LFE) When selected, limiting is applied to all incoming channels whenever any channel exceeds the Threshold setting.

All (no LFE) When selected, limiting is applied to all incoming channels whenever any channel, except the LFE channel, exceeds the Threshold setting.

Front/Back When selected, limiting is only applied to the Left, Center (if present), and Right channels only when the incoming signal on any front channel input exceeds the Threshold setting. Limiting is only applied to the Surround channels only when the incoming signal on any surround (or back) channel) exceeds the Threshold setting.

💡 *Insert a multi-mono instance of Pro Limiter to ensure no linking between channels. Each channel will trigger its own processing independently of the other channels.*

Auto Release

When Auto Release is enabled, Pro Limiter overrides the Release setting and automatically adjusts the limiter release time based on changes in the program material. When the Auto Release toggle is disabled, you can set the limiter release time manually using the Release control.

Listen

Enable Listen to isolate the processed part of the audio signal. This can help you hear what parts of the input signal are triggering limiting, which, in turn, can help you better understand the characteristics of the current Threshold, Character, and Release settings.

Loudness Numerical Displays

Pro Limiter provides numeric displays that show the current loudness or peak level of the processed signal. Note that Pro Limiter conforms to the "EBU R128" and "ITU-R BS.1770-3" standards for loudness metering.

Integrated Displays the current integrated level of the processed signal level in LUFS.

Range Displays the range of the processed signal level over time in LU.

**True Peak** Displays the true peak hold value of the Output signal in dB.

Short Term Displays the short term output signal level in LUFS.

About LUFS, LU, and dB

LUFS (Loudness Unit, Referenced to Full Scale) is a unit of measurement that expresses loudness levels on an absolute scale. LU (Loudness Unit) is a unit of measurement for differences between loudness levels (loudness levels on a relative scale). For example, program material that has a loudness level of –23 LUFS will be 2 LU quieter than program material that has a loudness level –21 LUFS. LU can also be used as the units for loudness levels relative to the target level. Note that since K-weighting has been adopted as the standard for loudness units, LUFS is equivalent with LKFS in Pro Limiter.

Decibels (dB) are an expression of the ratio of two levels: the level to be described (or measured) and a reference level. Letters after dB (such as dBm) signify the reference level. For example, dBm is referenced to 1 milliwatt, whereas dBu is references to 0.775Vrms. LUFS is a measurement on a decibel scale and is relative to the loudness level of a stereo (front left and front right) 1 kHz tone peaking at 0 dBFS (0 decibels at full scale).

Histogram and Loudness Meters
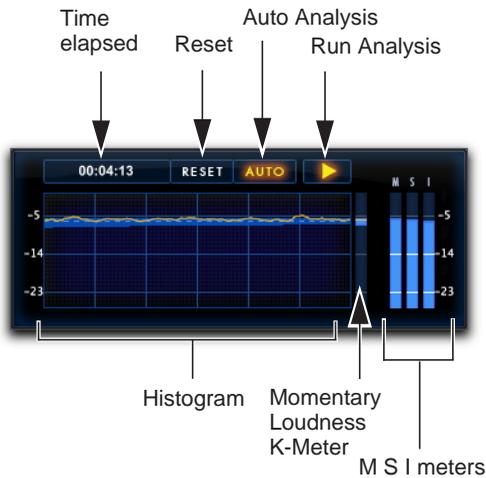
Pro Limiter Histogram and Loudness meters

Histogram

Pro Limiter provides a histogram that shows a graphic representation of loudness over time within a window of 60 seconds. The graph displays True Peak levels as a yellow line and the range of loudness over time as a blue shadow around the peak level line.

Time Elapsed Displays the amount of time elapsed since the current analysis pass started in hours, minutes, and seconds (00:00:00).

Reset Analysis Click the Reset button to reset the analysis.

Auto Analysis When Auto is enabled, Pro Limiter automatically pauses the analysis pass when the Pro Tools transport is stopped. This means that the drop in levels will not be reported with the Integrated and Range values. Note that it may be useful to disable Auto if you want to include a live audio signal being monitored through Pro Tools while the transport is stopped.

Run Analysis Click the Run Analysis (Play) button to enable (lit) or disable (unlit) analysis reporting in the histogram while the Pro Tools transport is stopped. Pro Limiter runs the analysis when the Pro Tools transport is running regardless of whether or not the Run Analysis option is enabled. Note that when the Auto analysis option is enabled, the Run Analysis option is overridden.

Loudness Meters

The Loudness meters to the right of the histogram show the level of the summed output of Pro Limiter. The meters range from 0 LUFS down to –50 dB LUFS. –23 LUFS is a common standard loudness reference level.

Momentary Loudness K-Meter Provides a display of the loudness range (as in the histogram). The current peak level is shown as a yellow line using K-scale metering.

Momentary Loudness Meter (M) Graphically displays the current true peak level.

Short Term Loudness Meter (S) Graphically displays the current short term output level.

Integrated Loudness K-Meter (I) Graphically displays the current integrated level of the processed signal using K-scale metering.

K-scale meters are RMS-based scales with an integrated sample peak meter as a secondary value. For more information about K-scale metering, see the paper "An Integrated Approach to Metering, Monitoring, and Levelling Practices" by Bob Katz, Digital Domain, Inc.

Adjusting the Loudness Meters View

The Loudness meters show a range of 27 LUFS. The default view shows from –14 to –41 LUFS. Drag up or down in the histogram to adjust the viewed range for loudness metering from 0 LUFS on the upper end down to –50 LUFS on the lower end.

AudioSuite Processing with Pro Limiter

When used as an AudioSuite plug-in, Pro Limiter does not provide real-time analysis data in the histogram or the loudness meter. Once you have rendered the audio selection with Pro Limiter processing, Pro Limiter loudness reporting updates to display the results of the processing.

Pro Limiter AudioSuite plug-in

AudioSuite Processing with Pro Limiter Loudness Analyzer

Use the Pro Limiter Loudness Analyzer to check loudness levels before rendering Pro Limiter processing if you need to read the current loudness measurements of your program material.

To analyze audio using the Pro Limiter Loudness Analyzer:

1 Make an audio selection in the Edit window.

2 Choose AudioSuite > Other > Pro Limiter Loudness Analyzer.

3 Click Analyze.

The Loudness numerical displays update to show the analyzed values (for information on the Loudness numerical displays, see "Loudness Numerical Displays" on page 11).

Pro Limiter Loudness Analyzer AudioSuite plug-in

💡 *With the Pro Limiter Loudness Analyzer, the Preview and Render buttons do not do anything useful. They are simply present as part of the AudioSuite plug-in framework.*