Avid® Pro Subharmonic
Plug-In Guide

Contents

Chapter 1: Introduction

Avid® Pro Subharmonic is an AAX format plug-in (DSP, Native, and AudioSuite) that provides low-frequency enhancement for your Pro Tools®, VENUE®, or Media Composer® system. It adds three bands of additional content created from the existing signal's bass frequencies.

Pro Subharmonic supports 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz sample rates.

The multichannel version of Pro Subharmonic supports stereo audio, and can also add a channel of LFE (.1) content to any 5.0, 6.0, or 7.0 track. Subharmonic material may also be added to the existing LFE channel of a 5.1, 6.1, or 7.1 track.

The mono/multi-mono version should be used for all other channel formats.

⚠ *Greater-than-stereo formats are only available with Pro Tools | HD Software.*

⚠ *7.0 SDDS to 7.1 SDDS and 7.1 SDDS to 7.1 SDDS instances of Pro Subharmonic are Native-only. All other channel formats are supported on both Native and DSP.*

This guide provides information on installing and using the Pro Subharmonic 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 Pro Subharmonic you need the following:

- An iLok USB Smart Key (version 2)
- An iLok.com account for managing iLok licenses
- A qualified Pro Tools system (version 11.1 or higher), VENUE® system, or Media Composer® system.

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 6).

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

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

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

Downloading Pro Tools Plug-In Installers

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.

Installing Plug-Ins for Pro Tools and Media Composer

For information on installing plug-ins for VENUE, refer to your VENUE documentation.

Installing Plug-Ins on Mac

To install a plug-in on Mac:

1 Download the installer for Mac from *www.avid.com*. After downloading, make sure the installer is uncompressed (.dmg).

2 Ensure that Pro Tools is already installed and has been launched at least once on your computer.

3 If Pro Tools is running, quit Pro Tools.

4 Locate and double-click the plug-in installer disk image.

5 Drag the plug-in (.aaxplugin) to the Plug-Ins folder alias in the disk image.

Installing Plug-Ins on Windows

To install a plug-in on Windows:

1 Download the installer for Windows from *www.avid.com*. After downloading, make sure the installer is uncompressed (.ZIP).

2 If Pro Tools is running, quit Pro Tools.

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

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

5 When installation is complete, click Finish.

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 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.

Removing Plug-Ins on Mac

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 Plug-Ins (Unused) folder.

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

Removing Plug-Ins on 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: Using Pro Subharmonic

Avid Pro Subharmonic is an AAX plug-in (DSP, Native, and AudioSuite) that synthesizes low-frequencies based on the harmonic content of the source audio signal.

Pro Subharmonic plug-in

In addition to standard knob, button, and fader controls, Pro Subharmonic also provides a graphic display of the synthesized frequencies and of the dynamic curves of the low pass and high pass filters applied to the low frequencies.

Metering

Pro Subharmonic provides channel-maximum sample peak meters for Input and Output signals.

The Peak Hold indicator appears as a thin 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.
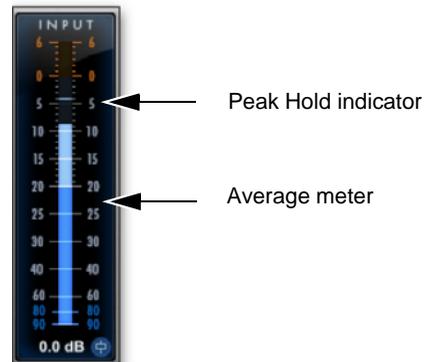
Pro Subharmonic Input meter

Input

The Input section provides input metering and controls for adjusting the level of the input signal.
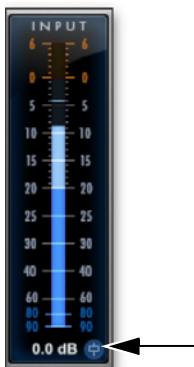
Input Level control

Input Level

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

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

- Click in the Input Level field and type a value (–18.0 dB to +18.0 dB).

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

Input Meters

The Input meters show channel-maximum sample peak meters summed from all input channels before processing (from –90 dB to +6.0 dB).

Output

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

Output Level control

Output Level

The Output Level control sets the output level after processing, letting you boost or attenuate gain of the output signal.

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

- Click in the Output Level field and type a value (–18.0 dB to +18.0 dB).

- Click the Output Volume control and drag up or down to adjust the Output Volume setting.

Output Meters

The Output meters show channel-maximum sample peak meters summed for all output channels after processing (from –90 dB to +6.0 dB).

Dynamic Frequency Display

Pro Subharmonic provides a graphic display for the synthesized frequency content, low frequency content already present in the source audio, and for the low and high pass filters.

Graphic Frequency and Dynamics display

High Pass Filter Curve Displays the frequency range and dynamic curve for the High Pass filter.

Low Pass Filter Curve Displays the frequency range and dynamic curve for the Low Pass filter.

Lower Synthesized Band Displays the dynamics of the lower range of synthesized frequencies.

Upper Synthesized Band Displays the dynamics of the upper range of synthesized frequencies.

Direct Bass Band Displays the dynamics and the frequency range of the direct bass band (the bass frequency content from the source audio signal).

High Pass and Low Pass Filter Controls

The High Pass and Low Pass filters shape the output of Pro Subharmonic. These filters apply to the direct, unprocessed low frequency content of the source signal as well as the synthesized frequencies.

High Pass and Low Pass Filter controls

HP Freq Sets the high frequency for the High Pass filter (5–1000 Hz).

HP Q Sets the Q for the High Pass filter (0.10–5.00).

LP Freq Sets the low frequency for the Low Pass filter (5–1000 Hz).

LP Q Sets the Q for the Low Pass filter (0.10–5.00).

To adjust the Frequency of the High Pass or Low Pass filter, do one of the following:

- Drag the fader icon, or drag in the numeric entry field.

- Click the numeric entry field, type a value, and press Enter.

- Move the cursor over the frequency curve in the Frequency Graph so that it shows the "FREQ" cursor, then drag to adjust the Frequency value.
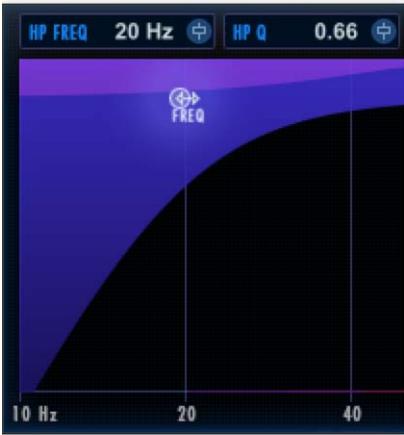
Adjusting the Frequency setting on the Frequency Graph

To adjust the Q of the High Pass or Low Pass filter, do one of the following:

- Drag the fader icon, or drag in the numeric entry field.

- Click the numeric entry field, type a value, and press Enter.

- Move the cursor over the frequency curve in the Frequency Graph so that it shows the "Q" cursor, then drag to adjust the Q value.
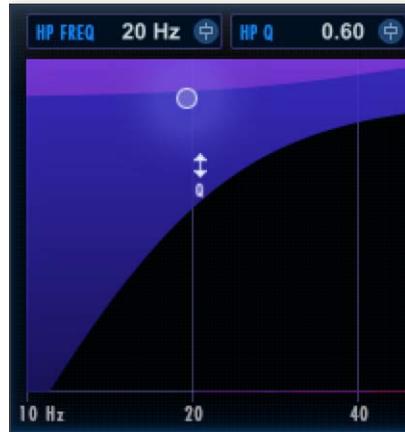
Adjusting the Q setting on the Frequency Graph

Subharmonic Frequency Range

Use the Subharmonic Frequency Range buttons to specify the frequency range of the source signal for the synthesized audio content. For example, in a post production setting, you might use the lowest option to reinforce an explosion in the LFE channel of a 5.0 source signal. Or, you might use the 60–90 Hz option for a stereo music mix to give it a little more "bump." The lower settings can add power to kick drums and explosions, while the higher ones add fatness to bass lines and low mid-range audio source signals. The best setting will depend on the audio content.

📄 *You can also use MIDI to tune Pro Subharmonic. This can be especially useful for music production. See "Tuning Subharmonics with MIDI" on page 15.*

To set the frequency range for synthesized subharmonics, click one of the following options:

- 120–180 Hz

- 80–120 Hz

- 60–90 Hz

- 40–60 Hz

Frequency Range Selector buttons

SHIFT *Shift-click the Input (Hz) button to automatically adjust the High Pass and Low Pass Frequency settings to align with the Input (Hz) setting.*

Lower, Upper, and Direct Gain Controls

Pro Subharmonic provides gain controls for the lower band, upper band, and direct bass band. You can also solo each.

Lower Gain   Upper Gain   Direct Gain

Solo button   Gain field

Band Gain controls

The Lower Band Gain control corresponds to the lower frequency of the currently selected Subharmonic Frequency Range setting. Likewise, the Upper Band Gain control corresponds to the upper frequency of the currently selected Subharmonic Frequency Range setting. The Direct Gain control lets you blend in some of the low frequency content of the source signal.

To adjust the gain for the Lower Band, Upper Band, or Direct Bass Band, do one of the following:

- Drag the Gain knob up or down, or to the left or right.

- Click the Gain field and type a value between –120 dB and 24 dB.

- Move the cursor over the corresponding Gain curve in the Frequency Graph so that it shows the "Gain" cursor, and drag to adjust the Gain value.
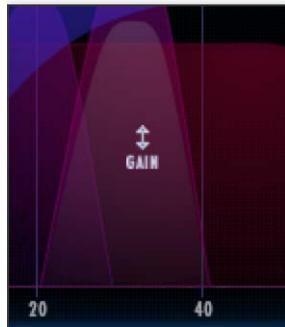
Adjusting the Gain setting on the Frequency Graph

To solo the Lower Band, Upper Band, or Direct Bass Band:

- Click the corresponding Solo button.

Drive

Use the Drive control to adjust the level of all three bands. The Drive control applies soft-saturation distortion, so it can be used to prevent internal clipping. The Drive effect is shaped by both the Low Pass and High Pass filters.

You can also select any one of six Drive Character options. These settings change the behavior and sound of Pro Subharmonic by altering the resonances of the internal filters and by adjusting the contour of the saturation stages in the processed signal path. For the cleanest, most direct sound, use Clean I. For a sound that adds some color, select one of the Resonant or Distort options.

Experiment with the various Drive Character options and the Drive level setting until you find the tone-quality you want.

Drive control

To adjust the amount of Drive, do one of the following:

- Drag the Drive knob up or down, or to the left or right.

- Click the Gain field and type a value between –18.0 dB and 18.0 dB.

To set the Drive Character, select one of the following options:

- Clean I

- Clean II

- Resonant I

- Resonant II

- Distort I

- Distort II

Mix Controls

Mono and Stereo tracks provide a single Mix control to balance the wet (added bass) signal and the dry signal. If any of the bands are soloed, the Mix solo button (the button to the right of the numeric field) flashes. Click the flashing button to unsolo all soloed bands. You can click the unlit Mix solo button to effectively mute the dry signal regardless of the Mix setting. This lets you audition only the synthesized and processed signal.

Mix control (Mono and Stereo tracks)

To adjust the dry/wet mix, do one of the following:

■ Drag the Mix knob up or down, or to the left or right.

■ Click the Gain field and type a value between 0% (all dry) and 100% (all wet).

💡 *When Mix is at 50%, both the wet and dry signal paths are at full volume. Setting the Mix control to values below 50% keeps the dry level at full, but decreases the amount of the wet signal. Conversely, settings the Mix control to values over 50% keeps the wet level at full, but decreases the level of the dry signal.*

For surround tracks, Pro Subharmonic provides multiple Mix controls.

Mix Output Lets you mix the output of Pro Subharmonic between the LFE channel and the Left and Right channels.

Wet Lets you mix the wet signal from 0–100% to the plug-in output.

Dry Lets you mix the dry signal from 0–100% to the plug-in output.

Wet and Dry Solo Buttons Let you solo the wet or dry output signals respectively. Only one of these may be soloed at a time (for example, soloing the Dry signal while the Wet signal is already soloed cancels the solo on the Wet signal).

Mix control (surround tracks)

Surround Send Controls

When Pro Subharmonic is inserted on a surround track, it provides controls to mix how much of the source audio is sent from the Front channels, the Center channel, the Surround channels, and the LFE channel (if present) for Subharmonic synthesis processing. For example, if your source audio has a big sound effect in the center channel and music in the front left and right channels, and you want subharmonics synthesized only from the sound effect, turn up the Center channel input and turn down the Front and Surround channel inputs. On .1 tracks only, Pro Subharmonic provides an LFE control so that you can create subharmonics using the audio on the LFE channel. Each input source can be soloed.

Surround Send controls

Front Send Lets you feed Pro Subharmonic from the front left and right input channels.

Center Send Lets you feed Pro Subharmonic from the center input channel.

Surround Send Lets you feed Pro Subharmonic from the surround input channels.

LFE Send (.1 Format Tracks Only) Lets you feed Pro Subharmonic from the LFE input channel.

Tuning Subharmonics with MIDI

In addition to using the Range Setting buttons, you can use MIDI to tune Pro Subharmonic. Pro Subharmonic can receive MIDI note numbers 12 through 60. This means that you can use MIDI notes to set the Band frequencies from 16 Hz up to 262 Hz. Use this to reinforce the low end of your program material based what key or mode it is in.

When Pro Subharmonic is receiving MIDI, the MIDI In icon highlights, the Range settings are controlled by the MIDI input, and the Range Setting buttons are bypassed. The Lower band is tuned to the incoming MIDI note and the Upper band is tuned to a perfect fifth above that.

⚠ *VENUE and Media Composer do not support MIDI.*

To route MIDI to Pro Subharmonic:

1 Insert Pro Subharmonic on a track.

2 Create a new MIDI track.

3 Route the output of the MIDI track to the corresponding Pro Subharmonic MIDI node.

Routing MIDI to Pro Subharmonic

To tune Pro Subharmonic with MIDI:

1 Use a MIDI track routed to the specific instance of Pro Subharmonic that you want to control.

2 Record, enter, or import a MIDI sequence on the MIDI track.

⚠ *Be sure to only use a monophonic MIDI sequence or live performance to control Pro Subharmonic.*

3 Play back the session. The MIDI In icon highlights when Pro Subharmonic is receiving MIDI.

Routing MIDI to Pro Subharmonic

💡 *The MIDI tuning feature can be used to lock Pro Subharmonic to a bass Virtual Instrument. Routing a MIDI track to both the input node of a bass Virtual Instrument and the input node of a Pro Subharmonic that is inserted after the Virtual Instrument creates subharmonics evenly across a four-octave playing range (from MIDI note number 12 up to MIDI note number 60).*

💡 *When using Pro Subharmonic with a bass Virtual Instrument, you may want to transpose the bass part up or down to better tune Pro Subharmonic. To do this, copy and paste the MIDI sequence to a new MIDI track and route the track output to Pro Subharmonic. Use Real-Time MIDI properties on the MIDI track to transpose the sequence as desired.*

MIDI Input to Pro Subharmonic AudioSuite

The AudioSuite version of Pro Subharmonic also supports MIDI input. This can be used to fine-tune the input frequency range for the AudioSuite version of Pro Subharmonic.

To tune Pro Subharmonic AudioSuite with MIDI:

1 Select the audio you want to process in the Edit window.

2 Open the AudioSuite version of Pro Subharmonic.

3 Create a new MIDI track and rout its output to Pro Subharmonic.

4 Send a MIDI note to Pro Subharmonic via the MIDI track.

5 Process the selected audio with Pro Subharmonic AudioSuite.