

Focusrite D2 and D3 Plug-Ins Guide

Version 2.1 for HD or LE Systems on Windows or Macintosh

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chapter 1

Introduction

Congratulations on your purchase of the Focusrite D2 or D3 plug-in for Pro Tools TDM systems. Focusrite D2 is a high-quality digital equalizer plug-in, and Focusrite D3 is a high-quality dynamics processor plug-in.

The Focusrite D2 and D3 plug-ins are real-time TDM plug-ins that retain the look and sound of Focusrite's renowned hardware units.

The D2 and D3 plug-ins provide support for 192 kHz, 176.4 kHz, 96 kHz, 88.2 kHz, 48 kHz, and 44.1 kHz sessions.

 *On 192 kHz or 176.4 kHz stereo tracks, Focusrite is only available as a multi-mono plug-in.*

Your Focusrite D2 or D3 plug-in package contains the following components:

- Installation CD-ROM
- License Card (for installing both the plug-in with an iLok Smart Key, not supplied)
- *Focusrite D2 and D3 Plug-Ins Guide* (electronic PDF guide)
- Registration Card

System Requirements

To use Focusrite D2 or D3, you need:

- ♦ A Digidesign-qualified Pro Tools system
 - or –
- ♦ A third-party software application that supports the Digidesign TDM, RTAS, or AudioSuite plug-in standard

 *MIX Farm and DSP Farm cards are not supported on Pro Tools|HD-series systems. HD Process cards are not supported on Pro Tools|24 MIX-series systems.*

Compatibility Information

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

For a list of Digidesign-qualified computers, operating systems, hard drives, and third-party devices, refer to the latest compatibility information on the Digidesign Web site (www.digidesign.com/compato).

 *If you are using Mac OS 9, refer to the version of this guide published with the Pro Tools 6.2 software release. This guide is available online, with other Pro Tools 6.2 documentation, at the Digidesign Web site (www.digidesign.com).*

Register Focusrite D2 and D3

Make sure to complete and return the registration card included with your plug-in. Registered users will receive periodic software update and upgrade notices. Please refer to the registration card for information on technical support.

Working with Focusrite D2 and D3 Plug-Ins

Refer to the *Pro Tools Reference Guide*, the *Digi-Rack Plug-Ins Guide*, or the electronic PDF copy of the *Digidesign Plug-Ins Guide* for information on working with plug-ins, including:

- Inserting Plug-Ins on Tracks
- Clip Indicators
- The Plug-In Window
- Adjusting Parameters
- Automating Plug-Ins
- Using the Librarian

Conventions Used in This Guide

All Digidesign guides use the following conventions to indicate menu choices and key commands:

Convention	Action
File > Save Session	Choose Save Session from the File menu
Control+N	Hold down the Control key and press the <i>N</i> key
Control-click	Hold down the Control key and click the mouse button
Right-click (Windows)	Click with the right mouse button

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 the Pro Tools Guides.*

chapter 2

Installation

Installing Focusrite D2 or D3

To install Focusrite D2 or D3, use the Installer CD-ROM.

To install Focusrite D2 or D3:

- 1 Insert the Installer CD-ROM in your CD-ROM drive and double-click the Installer.
- 2 Click Install.
- 3 When installation is complete, click Finish (Windows) or Quit (Macintosh).

When you open Pro Tools, you will be prompted to authorize your new plug-in.

Authorizing Focusrite D2 or D3

The Focusrite plug-ins are authorized using the iLok USB Smart Key and License Card from PACE Anti-Piracy.

The iLok is similar to a dongle, but unlike a dongle, it is designed to securely authorize multiple software applications from a variety of software developers.

This key can hold over 100 authorizations for all of your iLok-enabled software. Once an iLok is authorized for a given piece of software, you can use the iLok to authorize that software on any computer.

-  The iLok USB Smart Key is not supplied with your plug-in, and must be purchased separately.

License Cards are specific to each plug-in. You will receive the appropriate License Cards for the plug-ins that you purchase. License Cards have a small punch-out plastic chip called a GSM cutout.

 For additional information about iLok technology and authorizations, see the electronic PDF of the iLok Usage Guide.

To authorize the plug-in with iLok:

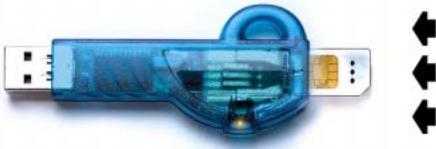
- 1 Insert the iLok into an available USB port on your computer.
- 2 Launch Pro Tools. You will be prompted to authorize any installed unauthorized plug-ins or software options.

 If you are already using a demo version of the plug-in, launch Pro Tools before you insert the iLok, then insert the iLok into any available USB port when prompted by Pro Tools.

3 Follow the on-screen instructions until you are prompted to insert the License Card into the iLok.

4 Separate the GSM cutout from the larger protective card by pulling it up and out with your thumb. Do not force the cutout down with your finger.

5 Insert the GSM cutout into the iLok. Visually verify that the metal portion of the cutout makes contact with the iLok's metal card reader.



iLok with License Card

6 Follow the on-screen instructions to complete the authorization process.

7 After the authorization has completed, remove the GSM cutout from the iLok. (If you have to remove the iLok from the computer to remove the cutout, be sure to re-insert the iLok in any available USB port on your computer when you are finished.)

Removing Expired Plug-Ins

If you let a demo version of a plug-in expire, you should remove it from your system. Otherwise, each time you open Pro Tools you will be prompted with a message that the plug-in has expired.

Windows

To remove an expired plug-in:

- 1** From the Start menu, choose Settings > Control Panel and double-click Add or Remove Programs.
- 2** Select the expired plug-in from the list of installed applications and click the Change/Remove button.
- 3** When removal is complete, click OK to close the window.

Mac OS X

To remove an expired plug-in:

- 1** Open the Plug-Ins folder or Plug-Ins (Unused) folder on your Startup drive (Library/Application Support/Digidesign).
- 2** Drag the expired plug-in to the Trash.
- 3** Empty the Trash.

chapter 3

Focusrite D2

Focusrite D2 is a high-quality digital equalizer plug-in for Pro Tools. Developed in cooperation with Focusrite, the D2 is based on the highly-acclaimed Red Range 2™ dual EQ, designed by Rupert Neve.

D2 features include:

- ◆ Up to six simultaneous bands of EQ, including: high-pass, low-shelf, low-mid peak, high-mid peak, high-shelf, and low-pass filters
- ◆ A highly accurate Cartesian graph that displays EQ curves in real-time as EQ parameters are adjusted



Focusrite D2

Focusrite D2 Configurations

There are three configurations of the Focusrite D2 plug-in, each designed to use a different amount of your system's DSP.

1–2 Band EQ

This module uses the least DSP. You can use up to two filters simultaneously, depending on which you enable. The high-pass, low-shelf, and low-pass filters each utilize the entire module and cannot be used in combination with another filter. The low-mid peak, high-mid peak, or high-shelf filters can be used in combination with each other (up to two bands total).

4-Band EQ

This module uses more DSP. You can use up to four filters simultaneously. Unlike the 1–2 Band EQ, any combination of filters can be engaged, up to a total of four bands.

6-Band EQ

This module uses the most DSP. You can use up to six filters simultaneously. By default, the low-pass and high-pass filters are in Bypass mode when the 6-Band EQ is first opened.

Adjusting Parameters

Editing Parameters Using a Mouse

You can adjust rotary controls with a mouse by dragging horizontally or vertically. Parameter values increase as you drag upward or to the right, and decrease as you drag downward or to the left.



Adjusting rotary controls

Editing Parameters Using a Computer Keyboard

Each rotary control has a corresponding parameter text field directly below it. This displays the current value of the parameter. You can edit the numeric value of a parameter with your computer keyboard.

To type a parameter value:

- 1 Click on the parameter text that you want to edit.
- 2 Change the value.
 - Type the desired value.
 - or –
 - To increase a value, press the Up Arrow on your keyboard. To decrease a value, press the Down Arrow on your keyboard.
- 3 Press Enter on the numeric keyboard to input the value and remain in keyboard editing mode.
 - or –

Press Enter on the alpha keyboard (Windows) or Return (Macintosh) to enter the value and leave keyboard editing mode.

D2 Parameters

Input Level

Input Level allows you to attenuate signal input level to the D2. The range of this control is from -18 dB to $+12$ dB.

When you use D2 in stereo, each channel has its own separate Input Level knob. To adjust input levels for both channels simultaneously, select the Link button, then drag either knob.



input Level

Output Level

Output Level allows you to adjust the overall output gain. The range of this control is from -18 dB to $+12$ dB.



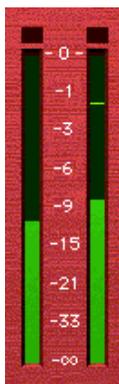
Output Level

When you use the D2 plug-in in stereo, each channel has its own separate output level knob. To adjust output levels for both channels simultaneously, select the Link button.

Meters

The D2's high-resolution plasma-style meters indicate signal levels and detect clipping at the input, algorithm, or output stage. When D2 is used in stereo, two meters appear, one for each channel.

A Clip Indicator is located above each meter. It indicates clipping by increasing its brightness as successive samples are clipped. Click the Clip Indicator to clear it. Alt-clicking (Windows) or Option-clicking (Macintosh) clears both channels when D2 is used in stereo.



Meters (Stereo mode)

Metering:

- Green = nominal levels.
- Yellow = pre-clipping at -6 below full scale signal.
- Red = full scale signal (clipping).

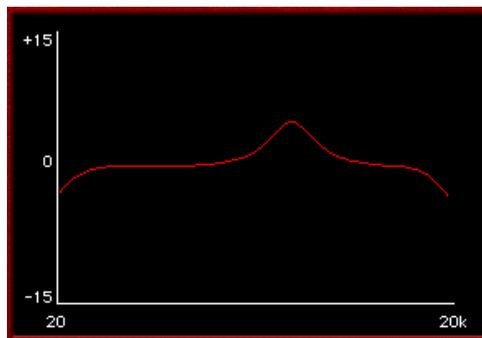


With Pro Tools 6.4, the Plug-In window includes a Clip LED that lights red to indicate plug-in clipping. The Plug-In Clip LED follows Pro Tools settings for clip indication. (For more information, see the Pro Tools Reference Guide, the DigiRack Plug-Ins Guide, or the electronic PDF copy of the Digidesign Plug-Ins Guide.)

The Cartesian Graph

The Cartesian Graph displays a visual representation of the current EQ settings. As you adjust the parameters of any currently active filter, the Cartesian Graph will plot the changes to the EQ

curve in real-time. If you are using D2 in stereo, the Cartesian Graph displays the EQ curve for the right channel in red and the left channel in blue.



Cartesian Graph



Alt-clicking (Windows) or Option-clicking (Macintosh) the Cartesian Graph resets all D2 parameters to their default settings. To reset parameters for both channels when in Stereo mode, Alt-Shift-click (Windows) or Option-Shift-click (Macintosh) the Cartesian Graph.

EQ Filter Controls

Each of the six different EQ filters has its own controls and its own icon. The icons act as three-state switches for enabling, disabling, or bypassing the specific filter. The current state of a filter is indicated by its color:

- White = enabled. In this state the filter is active, audible, and using available DSP resources.
- Black = disabled. In this state the filter is not using any DSP resources and has no effect on audio.
- Gray = bypassed. In this state the filter is not active, but is still using available DSP resources. The effect of the filter is not audible.

High-Pass Filter

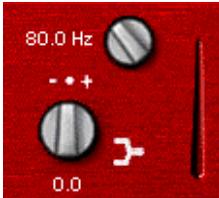
The 18 dB/octave High-Pass Filter provides a rotary control for adjusting the corner (cutoff) frequency, variable from 20 Hz to 6.4 kHz.



High-Pass Filter

Low-Shelf Filter

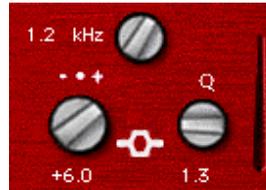
The Low-Shelf Filter provides two rotary controls: The upper rotary control adjusts the corner frequency, variable from 33 Hz to 460 Hz. The lower rotary control adjusts the filter's amplitude gain or attenuation. Amplitude range is ± 15 dB from unity.



Low-Shelf Filter

Low-Mid Peak Filter

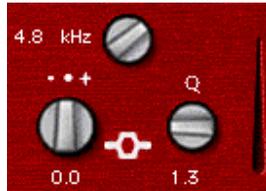
The Low-Mid Peak Filter provides three rotary controls. The upper rotary control adjusts the center frequency, variable from 33 Hz to 6.4 kHz. The lower left rotary control adjusts the filter's amplitude gain or attenuation. Amplitude range is ± 15 dB from unity (utilizing a reciprocal curve for both gain and attenuation). The lower right rotary control adjusts filter "Q" which is variable from 0.7 to 4.0.



Low-Mid Peak Filter

High-Mid Peak Filter

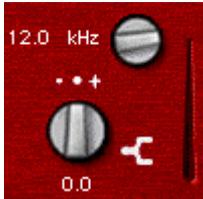
The High-Mid Peak Filter provides three rotary controls. The upper rotary control adjusts the center frequency, variable from 120 Hz to 18 kHz. The lower left rotary control adjusts the filter's amplitude gain or attenuation. Amplitude range is ± 15 dB from unity (utilizing a reciprocal curve for both gain and attenuation). The lower right rotary control adjusts filter "Q" which is variable from 0.7 to 4.0.



High-Mid Peak Filter

High-Shelf Filter

The High-Shelf Filter provides two rotary controls: The upper rotary control adjusts the corner frequency, variable from 3.3 kHz to 18 kHz. The lower rotary control adjusts the filter's amplitude gain or attenuation. Amplitude range is ± 15 dB from unity.



High-Shelf Filter

Low-Pass Filter

The 18 dB/octave Low-Pass Filter provides a rotary control for adjusting the filter's corner cut-off frequency, variable from 100 Hz to 18 kHz.



Low-Pass Filter

Enabling, Disabling and Bypassing EQ Filters

You can enable, disable, or bypass specific EQ filters by clicking them.

To disable a filter:

- Start key-click (Windows) or Control-click (Macintosh) the EQ Filter icon. When disabled, the icon is black.

To re-enable a filter:

- Click the EQ filter icon. When enabled, the icon is white.

To bypass a filter:

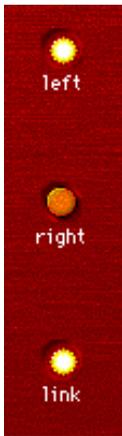
- Click the EQ filter icon a second time. When bypassed, the icon is grey.

⚠ *If you are using all available bands of the 1–2 Band or 4–Band EQ and want to change filter types, you must disable one filter before you can enable a different one.*

Using D2 in Stereo

Because Focusrite D2 has a single set of Filter parameter knobs, when it is used in stereo, you must select which channel, left or right, you want to edit.

Use the Left Channel, Right Channel, and Link buttons to do this. These controls only appear when D2 is used in stereo.



Left Channel, Right Channel, and Link buttons

Left Channel and Right Channel Buttons

The Left Channel and Right Channel buttons are used to select which channel is active for parameter editing.

Selecting the Left Channel button activates the left channel for editing. Any changes made to EQ parameters will affect the left channel of the stereo signal.

Selecting the Right Channel button activates the right channel for editing. Any changes made to EQ parameters will affect the right channel of the stereo signal.

Link Button

Selecting the Link button allows you adjust parameters for both channels simultaneously. By default, Link mode is enabled so that you can easily maintain parity between the parameter settings for both channels.

You can also use Link mode to help you maintain a relative offset between parameters settings on the two channels.

Maintaining an offset:

- 1 Deselect the Link button.
- 2 Select the desired channel button, left or right, and adjust the parameters for that channel.
- 3 Select Link mode and adjust the same parameters for the opposite channel. D2 will maintain the relative offset between the parameter settings for the two channels.



Alt-click (Windows) or Option-click (Macintosh) while linking channels with offsets to copy the parameters of the active channel to the opposite channel (including input and output levels).

chapter 4

Focusrite D3

Focusrite D3 is a high-quality dynamics processor plug-in for Pro Tools. Developed in cooperation with Focusrite, the D3 is based on the highly acclaimed Red Range 3™ dual mono/stereo compressor & limiter designed by Rupert Neve.

Focusrite D3 Configurations

There are two configurations of the real-time TDM Focusrite D3 plug-in:

- ◆ **Compressor+Limiter.** This configuration allows you to use both the compressor and the limiter at the same time. The Compressor+Limiter plug-in requires twice as much DSP as the Compressor/Limiter.
- ◆ **Compressor/Limiter.** This configuration allows you to use either the compressor or the limiter—but not both at the same time. The Compressor/Limiter plug-in uses half as much DSP as the Compressor+Limiter. It is provided so that you can conserve DSP, since you may not need both compression and limiting at the same time.



Focusrite D3

The Compressor/Limiter defaults to the compressor being enabled and the limiter disabled.

To enable the limiter:

- 1 Disable the compressor by Start key-clicking (Windows) or Control-clicking (Macintosh) its icon.
- 2 Click the Limiter icon.



Compressor and Limiter icons

The D3 Compressor

The D3 compressor reduces the dynamic range of audio signals that exceed a user-selectable threshold by a specific amount. This is accomplished by reducing output levels as input levels increase above the threshold.

The amount of output level reduction that D3 applies as input levels increase is referred to as the *compression ratio*. This parameter is adjustable. If you set the compression ratio to 2:1, for example, for each 2 dB that the signal exceeds the threshold, the output will increase only by 1 dB. With a compression ratio of 4:1 for example, an 8 dB increase in input will produce only a 2 dB increase in output.

The D3 Limiter

The D3 limiter operates as a fast-attack compressor with a high compression ratio. It doesn't attack instantaneously or look ahead in order to attack ahead of time, but instead uses a very fast,

1-millisecond attack time. As such, the D3 is not a “brick wall” limiter, but limits the overall dynamic range of signals in a sonically-pleasing way.

Like the Compressor, the Limiter is activated when the signal exceeds the user-selected threshold. The Limiter then compresses any signal above the selected threshold down to the threshold limit that you have set.

Side-Chain Processing

Compressors and limiters generally use the detected amplitude of the input signal as a control source. Other signals can also be used as a control source by using a key input. With de-essing, for example, a frequency-modified version of the input signal is used as a trigger. This is known as *side-chain* processing.

Side-chain processing allows the D3 compression or limiting to be controlled by another independent audio signal—typically another Pro Tools track. In this way you can compress or limit one track's audio using the dynamics of a different track's audio.

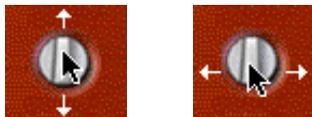
Using the D3 Plug-In in Stereo

In stereo configurations, all D3 controls except the Input Level affect both channels of the stereo signal. The D3's RMS detector (which derives the control signal that drives the dynamics processing) uses a composite of the two channels. Because of this, when stereo processing occurs, there is no image shift when signal levels differ between the two channels, since the composite control signal drives processing for both channels.

Adjusting Parameters

Editing Parameters Using a Mouse

You can adjust rotary controls with a mouse by dragging horizontally or vertically. Parameter values increase as you drag upward or to the right, and decrease as you drag downward or to the left.



Adjusting rotary controls

Editing Parameters Using a Computer Keyboard

Each rotary control has a corresponding parameter text field directly below it. This displays the current value of the parameter. You can edit the numeric value of a parameter with your computer keyboard.

To type a parameter value:

- 1 Click on the parameter text that you want to edit.
- 2 Change the value.
 - Type the desired value.
 - or –
 - To increase a value, press the Up Arrow on your keyboard. To decrease a value, press the Down Arrow on your keyboard.
- 3 Press Enter on the numeric keyboard to input the value and remain in keyboard editing mode.
 - or –

Press Enter on the alpha keyboard (Windows) or Return (Macintosh) to enter the value and leave keyboard editing mode.

D3 Parameters

Input Level

Input Level attenuates signal input level to the compressor or limiter. The range of this control is from -30 dB to 0 dB.

When you use the stereo version of the D3 plug-in, each channel has its own separate Input Level knob. To adjust input levels for both channels simultaneously, Shift-drag. Alt-Shift-clicking (Windows) or Option-Shift clicking (Macintosh) either Input Level knob resets both channels to 0 dB.



Input Level

Output Level

Output Level adjusts the overall output gain. Because large amounts of compression can restrict dynamic range, the Output Level knob is useful for compensating for heavily compressed signals and making up the resulting difference in level.

When you use the stereo version of the D3 plug-in, this single knob controls the master output for both channels. The range of this control is from -12 dB of attenuation to $+18$ dB of gain.



Output Level

Key On/Off

Key On/Off enables and disables side-chain processing. As explained earlier, side-chain processing allows the D3 plug-in to listen to the varying amplitude of a separate reference track and use it to trigger compression or limiting. Chapter 2 of this Guide explains how to set up and use a key input in greater detail.



Key On/Off

Key Listen On/Off

Key Listen On/Off enables and disables auditioning of the reference track controlling the side-chain. This is useful for fine-tuning the compressor's settings to the key input.



Key Listen On/Off

Meters

The meters indicate gain reduction (the top meter) and output level (the bottom meter). The Gain Reduction meter indicates the amount of gain reduction in dB. The Output Level meter indicates the output signal level in dB.

In Stereo mode, two Output Level meters appear, one for each channel. However, a single Gain Reduction meter is used for both channels, since the D3's RMS detector uses a composite control signal.

A red Clip Indicator appears to the right of the output meter(s). Clicking on the Clip Indicator clears it. Alt-clicking (Windows) or Option-clicking (Macintosh) clears both channels when the plug-in is used in stereo.



Meters

Metering indicators:

- Green indicates nominal levels.
- Yellow indicates pre-clipping at -6 below full scale.
- Red indicates a full scale signal (clipping).



With Pro Tools 6.4, the Plug-In window includes a Clip LED that lights red to indicate plug-in clipping. The Plug-In Clip LED follows Pro Tools settings for clip indication. (For more information, see the Pro Tools Reference Guide, the DigiRack Plug-Ins Guide, or the electronic PDF copy of the Digidesign Plug-Ins Guide.)

D3 Compressor Controls

The Compressor icon, which represents a compression curve, acts as a three-state switch for enabling, disabling, or bypassing the compressor. Its current state is indicated by the icon's color.



Compressor icon

- White indicates enabled. In this state the compressor is active and using available DSP resources.
- Black indicates disabled. In this state, the compressor is not using DSP resources.
- Gray indicates bypassed. In this state the compressor is not active, but is still using available DSP resources.



Compressor controls

To disable the compressor:

- Start key-click (Windows) or Control-click (Macintosh) the icon. When the compressor is disabled, the icon is black.

To re-enable the compressor:

- Click the icon. When the compressor is enabled, the icon is white.

To bypass the compressor:

- Click the icon a second time. When the compressor is bypassed, the icon is grey.

If you are using the *Compressor/Limiter plug-in*, which allows you to use either the compressor or the limiter (but not both simultaneously), you must disable one module by Start key-clicking the icon (Windows) or Control-clicking it (Macintosh) before you can enable the other.

Ratio

Ratio sets the compression ratio. If the ratio is set to 2:1 for example, it will compress changes in signals above the threshold by one half. The range of this control is from 1.5:1 (very little compression), to 10:1 (heavy compression, bordering on limiting).



Ratio

Threshold

Threshold sets the threshold level. Signals that exceed this level will be compressed. Signals that are below it will be unaffected. The range of this control is from 0 dB to -48 dB. A setting of 0 dB is equivalent to no compression.



Threshold

Attack

Attack sets the compressor attack time. To use compression most effectively, the attack time should be set so that signals exceed the threshold level long enough to cause an increase in the average level. This helps ensure that gain reduction doesn't decrease the overall volume. The range of this control is from 1.0 ms to 150.0 ms.



Attack

Release

Release controls how long it takes for the compressor to be fully deactivated after the input signal drops below the threshold level. In general, this setting should be longer than the attack time and long enough that if signal levels repeatedly rise above the threshold, they cause gain reduction only once. If the release time is too long, a loud section of the audio material could cause gain reduction that persists through a soft section. The range of this control is from 25 milliseconds to 2.5 seconds.



Release

Auto Release

Auto Release enables the automatic release function. In this mode the Release control has no effect on release time. Instead, the D3 uses a release time value that is program dependent and based on the audio being processed.

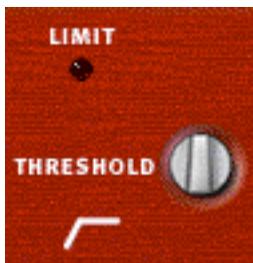


Auto Release

D3 Limiter Controls

The Limiter icon, which represents a limiter curve, acts as a three-state switch for enabling, disabling, or bypassing the limiter. Its current state is indicated by the icon's color:

- White indicates enabled. In this state, the limiter is active and using available DSP resources.
- Black indicates disabled. In this state, the limiter is not using DSP resources.
- Gray indicates bypassed. In this state, the limiter is not active, but is still using available DSP resources.



Limiter controls



Limiter In/Out icon

To disable the limiter:

- Start key-click (Windows) or Control-click (Macintosh) the icon. When the limiter is disabled, the icon is black.

To re-enable the limiter:

- Click the icon. When the limiter is enabled, the icon is white.

To bypass the limiter:

- Click the icon a second time. When the limiter is bypassed, the icon is grey.

If you are using the Compressor/Limiter plug-in, which allows you to use either the compressor or the limiter (but not both simultaneously), you must disable one module by Start key-clicking the icon (Windows) or Control-clicking it (Macintosh) before you can enable the other.

Limit LED

When lit, the Limit LED indicates that limiting is being applied. When unlit, limiting is not being applied.



Limit LED

Threshold

This sets the threshold level. Signals that exceed this level will be limited. Signals that are below it will be unaffected. A setting of 0 dB is equivalent to no limiting. The range of this control is from -24 dB to 0 dB.



Threshold

appendix a

DSP Requirements

The number of TDM plug-ins you can use at one time depends on how much DSP power is available in your system. Since the TDM hardware on Pro Tools cards provide dedicated DSP for plug-ins, plug-in performance isn't limited by CPU processing power.

The tables in this appendix show the total number of instances of each plug-in that can be powered by a single DSP chip on Pro Tools|HD and Pro Tools|24 MIX cards. DSP usage differs according to card type.

There are a total of nine DSP chips on a Pro Tools|HD card (HD Core, HD Process, and HD Accel). HD Core and HD Process cards provide identical chip sets. HD Accel cards provide newer, more powerful DSP chips (making the HD Accel card ideal for DSP-intensive plug-ins, and for high sample rate sessions). There are six DSP chips on a Pro Tools|24 MIX card.

Not all plug-ins are supported on all types of chips. The following tables indicate the number of compatible chips per card.

⚠ *The tables show theoretical maximum performance when no other plug-ins are sharing available DSP resources. You will typically use more than one type of plug-in simultaneously.*

Plug-ins used in multi-mono format on greater-than-stereo tracks require one mono instance per channel of the multi-channel audio format. For example, a multi-mono plug-in used on a 5.1 format track, requires six mono instances since there are six audio channels in the 5.1 format.

Monitoring DSP Usage

The System Usage window (Windows > Show System Usage) shows how much DSP is available in your system and how it is being used in the current Pro Tools session.

 *For more information about DSP usage and allocation, see the Pro Tools Reference Guide.*

Focusrite DSP Requirements

The Focusrite plug-ins have the following DSP requirements:

HD Accel Card

Table 2. Maximum instances of real-time TDM plug-ins per DSP chip for an HD Accel card at different sample rates (mono and stereo)

Sample Rate:	44.1/48 kHz		88.2/96 kHz		174.6/192 kHz		Compatible DSP Chips per HD Accel Card
	Mono	Stereo	Mono	Stereo	Mono	Stereo	
Focusrite d2 v2.0 (1-band or 2-band)	55	20	28	14	12	6	9
Focusrite d2 (4-band)	28	14	14	7	6	3	9
Focusrite d2 (6-band)	10	5	7	3	3	1	9
Focusrite d3 (comp+limiter)	23	21	11	10	5	4	9
Focusrite d3 (comp/limiter)	43	36	20	17	9	8	9

HD Core and HD Process Cards

Table 3. Maximum instances of real-time TDM plug-ins per DSP chip for an HD Core or HD Process card, at different sample rates (mono and stereo)

Sample Rate:	44.1/48 kHz		88.2/96 kHz		174.6/192 kHz		Compatible DSP Chips per HD Core or Process Card
	Mono	Stereo	Mono	Stereo	Mono	Stereo	
Focusrite d2 (1-band or 2-band)	28	14	12	2	4	2	9
Focusrite d2 (4-band)	28	7	6	6	2	1	9
Focusrite d2 (6-band)	7	3	3	1	1	1	9
Focusrite d3 (comp+limiter)	10	9	4	4	1	1	9
Focusrite d3 (comp/limiter)	18	16	8	7	3	3	9

Pro Tools|24 MIX Card

Table 4. Maximum instances of real-time TDM plug-ins per DSP chip for a Pro Tools|24 MIX card

Plug-In	Mono	Stereo	Compatible DSP Chips per Mix Card
Focusrite d2 (1-band or 2-band)	24	12	6
Focusrite d2 (4-band)	12	6	6
Focusrite d2 (6-band)	6	3	6
Focusrite d3 (comp+limiter)	8	7	6
Focusrite d3 (comp/limiter)	14	12	6

DSP Farm Card

Table 5. Maximum instances of real-time TDM plug-ins per DSP chip for a DSP Farm card

Plug-In	Mono	Stereo	Compatible DSP Chips per DSP Farm Card
Focusrite d2 (1-band or 2-band)	12	6	4
Focusrite d2 (4-band)	6	3	4
Focusrite d2 (6-band)	3	1	4
Focusrite d3 (comp+limiter)	4	3	4
Focusrite d3 (comp/limiter)	7	6	4

appendix b

DSP Delays Incurred by TDM Plug-Ins

Virtually all TDM plug-ins incur some amount of signal delay.

This is significant only if you use a plug-in on one channel of a stereo or multichannel signal but not the others, since this can cause the channels to be slightly out of phase.

If you are working with mono tracks, or are processing all channels with the same plug-in, the signal delays are not long enough to be significant and should not be a concern.

Table 3 on page 24 shows the delays inherent in each plug-in.

Channel Delay Indicator

The Channel Delay Indicator in the Mix window displays the total delay, in samples, incurred on the track from the use of any TDM plug-in on that channel.

To see the amount of time delay on a track that uses plug-in inserts.

- In the Mix window, Control-click (Windows) or Command-click (Macintosh) the track's Volume Indicator to toggle between Volume ("vol"), Peak ("pk") and Channel Delay ("dly") indications.

Compensating For Delays

If it becomes necessary to compensate for plug-in delay, use the TimeAdjuster plug-in included with Pro Tools. See the *DigiRack Plug-Ins Guide* or *Pro Tools Reference Guide* for more information on TimeAdjuster.



For a comprehensive guide to calculating DSP-induced delays, see the Pro Tools Reference Guide.

Focusrite D2 and D3 DSP Delay

Table 3. Samples of delay incurred by each TDM plug-In on HD, MIX, and DSP Farm cards

Plug-In	Samples of Delay on HD Cards	Samples of Delay on MIX Cards	Samples of Delay on DSP Farm Cards
Focusrite d2 (1-band or 2- band)	5	5	3
Focusrite d2 (4-band)	5	5	3
Focusrite d2 (6-band)	5	5	3
Focusrite d3 (Comp+Lim)	4	4	4
Focusrite d3 (Comp/Lim)	4	4	4

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