



Drawmer Dynamics Plug-Ins Guide

Version 9.0

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chapter 1

Introduction

Thank you for purchasing the Drawmer Dynamics plug-in for Pro Tools®|HD and VENUE™ systems.

Based in England, Drawmer has a longstanding reputation for creating high-quality, industry-standard analog and digital signal processing devices, including microphone preamplifiers, esoteric tube equipment, equalizers, and most significantly, dynamics processors.

The Drawmer Dynamics plug-in is a real-time TDM plug-in that retains the look and sound of tow of Drawmer's renowned hardware units, the highly-acclaimed Drawmer DS201 and DL241.

There are two configurations of the Drawmer Dynamics plug-in:

DrawmerECL Providing an Expander, Compressor, and Limiter.

DrawmerGCL Providing a Gate, Compressor, and Limiter.

Contents of the Boxed Version of Your Plug-In

Your Drawmer Dynamics plug-in package contains the following components:

- Installation disc
- Activation Card with an Activation Code

System Requirements and Compatibility

To use Drawmer Dynamics, you need the following:

- An iLok USB Smart Key
- An iLok.com account for managing iLok licenses
- One of the following:
 - A qualified Pro Tools|HD system or Pro Tools|HD Accel system
 - or –
 - A qualified VENUE system

⚠ *The Drawmer Dynamics plug-in does not support sample rates above 96 kHz.*

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.

Working with Plug-Ins

See the *Pro Tools Reference Guide* for general information on working with plug-ins in Pro Tools[®], 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 and VENUE 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

Installers for your plug-ins can be downloaded from the Avid Store (<http://shop.avid.com>) or can be found on the plug-in installer disc (included with boxed versions of plug-ins).

An installer may also be available on the Pro Tools installer disc or on a software bundle installer disc.

 For information on installing plug-ins for VENUE systems, see your D-Show guide.

To install a plug-in:

- 1 Do one of the following:
 - 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).
 - or –
 - Insert the Installer disc into your computer.
- 2 Double-click the plug-in installer application.
- 3 Follow the on-screen instructions to complete the installation.
- 4 When installation is complete, click Finish (Windows) or Quit (Mac).

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


Authorizing Plug-Ins

Software is 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 (such as Pro Tools|HD-series systems), or purchase one separately.

Authorizing Downloaded Software


If you downloaded software from the Avid Store (<http://shop.avid.com>), you authorize it by downloading a license from [iLok.com](http://www.iLok.com) to an iLok.

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

Authorizing Boxed Versions of Software

If you purchased a boxed version of software, it comes with an Activation Code (on the included Activation Card).

To authorize software using an Activation Code:

- 1 If you do not have an iLok.com account, visit www.iLok.com and sign up for an account.
 - 2 Transfer the license for your software to your iLok.com account by doing the following:
 - Visit www.avid.com/activation.
 - and –
 - Input your Activation Code (listed on your Activation Card) and your iLok.com User ID. Your iLok.com User ID is the name you create for your iLok.com account.
 - 3 Transfer the licenses from your iLok.com account to your iLok USB Smart Key by doing the following:
 - Insert the iLok into an available USB port on your computer.
 - Go to www.iLok.com and log in.
 - Follow the on-screen instructions for transferring your licenses to your iLok.
-  *For more information, visit the iLok website (www.iLok.com).*
- 4 Launch Pro Tools.
 - 5 If you have any unauthorized software installed, you are prompted to authorize it. Follow the on-screen instructions to complete the authorization process.

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 /Digidesign/Plug-Ins).
- 2 Do one of the following:
 - Drag the plug-in to the Trash and empty the Trash.
 - or –
 - Drag the plug-in to the Plug-Ins (Unused) folder.

Windows

To remove a plug-in:

- 1 Choose Start > Control Panel.
- 2 Under Programs, click Uninstall a program.
- 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

Drawmer Dynamics Parameters

This chapter explains the parameters of the Drawmer Dynamics Expander, Gate, and Compressor modules.

For information on using Drawmer Dynamics, see “Using Drawmer Dynamics” on page 21.



DrawmerECL plug-in



DrawmerGCL plug-in

Adjusting Plug-In Parameters

You can adjust plug-in controls by dragging the control's slider or knob, or by typing a value into the control's text box. Additionally, some plug-ins have switches that can be enabled by clicking on them.

To adjust a plug-in control:

- 1 Begin audio playback so that you can hear the control changes in real time.
- 2 Adjust the controls of the plug-in for the effect you want. Refer to “Editing Parameters Using a Mouse” on page 7 and “Editing Parameters Using a Computer Keyboard” on page 8.

Closing the plug-in will save the most recent changes.

Editing Parameters Using a Mouse

You can adjust rotary controls 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.

Keyboard Shortcuts

- ◆ For finer adjustments, Control-drag (Windows) or Command-drag (Mac) the control.
- ◆ To return a control to its default value, Alt-click (Windows) or Option-click (Mac) the control.

Increment & Decrement

For incremental parameter adjustment, click the up or down increment buttons at the right of each parameter text box.



Using the increment and decrement buttons

Editing Parameters Using a Computer Keyboard

Some controls have text boxes that display the current value of the parameter. You can edit the numeric value of a parameter with your computer keyboard.

If multiple plug-in windows are open, Tab and keyboard entry remain focused on the plug-in that is the target window.

To change control values with a computer keyboard:

- 1 Click the text box corresponding to the control that you want to adjust.
 - 2 Change the value.
 - To increase a value, press the Up Arrow on your keyboard. To decrease a value, press the Down Arrow on your keyboard.
- or –
- Type the desired value.

💡 In fields that support values in kilohertz, typing “k” after a number value will multiply the value by 1,000. For example, type “8k” to enter a value of 8,000.

3 Do one of the following:

- 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 (Mac) to enter the value and leave keyboard editing mode.

💡 To move forward through the different control fields, press the Tab key. To move backward, press Shift+Tab.

Editing Parameters Using a Scroll Wheel

Some controls have text boxes that display the current value of the parameter. You can edit the numeric value of a parameter using a scroll wheel.

To change control values using a scroll wheel:

- 1 Click the text box corresponding to the control that you want to adjust.
- 2 To increase a value, scroll up with the scroll wheel. To decrease a value, scroll down with the scroll wheel.

Toggling Switches

To toggle a switch:

- Click the switch.

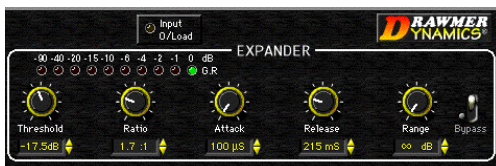
Expander Module

The Expander is part of the DrawmerECL plugin and is modelled on the Drawmer DL241 and DS201 hardware processors.

For more information on using the Expander, see “Using the Expander Module” on page 24.

Features

- ◆ Auto-adaptive attack and release for a more musical response
- ◆ Upward expansion capability with a wide Threshold
- ◆ Adjustable Ratio with soft-knee options
- ◆ Gain reduction LED metering



Expander

A common problem with compression is that maximum gain compensation occurs during extremely quiet passages or during pauses. This results in an increase of background noise, the degree of which depends on the amount of compression applied.

The accepted way of dealing with this problem is to use an Expander for low-level gating that keeps quiet passages or pauses in the material clean. A problem with simple expanders is that they may undesirably process low-level audio signals, since the expander has no way of differentiating low-level audio signals from noise.

On a vocal track, for example, this can lead to the start or ending of words being accidentally removed, especially if the singer has a wide dynamic range.

Auto-Adaptive Expansion

The Expander has the ability to automatically adapt its settings to audio material. This mode of operation is enabled by turning the Ratio control fully clockwise to the Soft or Softer setting. It automatically varies ratio and release time depending on the dynamics of the signal being processed.

The Expander's transition from unity gain to maximum gain reduction is then dependant on how far the input level exceeds the threshold setting.

Because the onset of expansion is progressive, low-level signals will be processed with a lower ratio of expansion while the residual noise during pauses will be processed with a higher ratio of expansion (resulting in greater attenuation). This makes the Expander easier to use effectively and more likely to preserve desired audio signals that are only slightly above the residual noise floor.

Expander Parameters

Threshold Control

The Threshold control sets the level below which expansion starts to take place. Threshold range is from -70 dB to +12 dB.

Setting this control above 0 dB permits upwards expansion, where over-compressed material can be re-expanded.

Ratio Control

The Ratio control sets the amount of attenuation applied to the signal as it decreases below the Threshold level.

Ratio range is from 1.1:1 to 50:1. At 1.1:1 the Expander closes only slightly (an input signal that is 10dB below the Threshold setting will be output at -11 dB). At 50:1 the Expander functions like a Gate (an input signal that is 2 dB below the Threshold setting will be reduced by 100 dB).

To enable the Expander's ability to automatically adapt its settings to audio material, turn the Ratio control fully clockwise until either the Soft or Softer setting appears.

Attack Control

The Attack control sets the rate at which the Expander opens from a closed state. Attack speed ranges from 100 μ S (0.0001 seconds) to 1.5 seconds. A very fast attack time can sometimes produce audible clicks on low frequency signals.

Release Control

The Release control determines the speed at which the Expander closes to the Range setting once the input signal has fallen below the Threshold level. Release ranges from 50 ms to 2.5 seconds.

With slow, legato audio material, very fast release times can result in audible and possibly undesirable side-effects, due to the gain changing too quickly.

Range Control

The Range control sets the level to which the Expander will close, once the input signal has fallen below the Threshold setting. Range is from 0 dB (no expansion) to infinity (∞ dB). In general, use a much smaller range setting than you would with a Gate.

Bypass Switch

The Bypass toggle switch bypasses the Expander.

Expander Gain Reduction (GR) Meter

This ten-element LED meter indicates from 0 dB to 90 dB of gain reduction. The number of illuminated LEDs will change as the Range control is adjusted, indicating the maximum gain reduction achievable.

The Gate Module

The Gate is part of the DrawmerGCL plug-in. It is based on the highly acclaimed Drawmer DS201 hardware dynamics processor, which was instrumental in creating many recording effects that have become industry standard practice such as the Gated reverb, and enhanced percussive kick-drums.

For more information on using the Gate module, see “Using The Gate Module” on page 22.

Features

- ◆ Variable high-pass and low-pass filters for frequency-conscious gating
- ◆ Comprehensive envelope control with attack, hold, release and range
- ◆ Ultra-fast response time
- ◆ Comprehensive side-chain filtering
- ◆ Key listen capability for monitoring the effect of the Key Filter
- ◆ LEDs for clear indication of Gate status
- ◆ Duck mode for voice-overs



Gate

Gate Parameters

HF & LF Key Filters

These controls adjust the roll-off frequencies of the Key filters. The LF or low frequency filter ranges from 32 Hz to 4 kHz and attenuates signals below the cut-off frequency at 12 dBs per octave. The HF or high frequency filter ranges from 250 Hz to 16 kHz and attenuates signals above the cut-off frequency. When both filters are used, only the frequency band between the two settings remains.

These controls do not overlap each other, since this would produce very little audio output.

Side-Chain/Internal Control

Setting this control to Side-Chain enables side-chain processing. Side-Chain processing permits triggering of the Gate by a mono source or *key input* other than the gated material itself. Setting this control to internal disables side-chain processing. (See “Using the Key Side-Chain Circuit” on page 22 for more information.)

Key Listen/Normal Switch

Set this toggle to Key Listen to monitor the audio specified as the key input. (See “Using the Key Side-Chain Circuit” on page 22 for more information.)

Threshold Control

The Threshold control sets the level below which gating takes place (the level at which the output of the Key Filter triggers the Gate). Threshold ranges from -70 dB to 0 dB. Setting this control fully counter-clockwise closes the Gate.

For most noise removal applications, set the Threshold as low as is possible, so that none of the desired signal is lost.

Attack Control

The Attack control sets the rate at which the Gate opens from a closed state. Attack ranges from 20 μ S (about 1 sample) to 1.7 seconds.

A very fast attack time can sometimes produce audible clicks on low frequency signals.

Hold Control

The Hold control determines the amount of time the Gate is held open after the signal falls below the Threshold setting. Hold range is from 2 ms to 2.2 seconds. Hold helps prevent spurious re-triggering of the Gate when using fast release times. It is also useful for creating the classic gated reverb sound often applied to drums.

The Hold cycle starts when the Threshold is crossed. Audio material with slow attacks requires the Hold setting to be at least as long as the Attack setting for it to complete its attack cycle.

Release Control

The Release control determines the speed at which the Gate closes to the Range setting after the input signal has fallen below the Threshold level. Release range is from 1 ms to 9 seconds. Longer releases help retain the original envelopes of the gated audio.

Range Control

The Range control sets the level to which the Gate closes after the input signal has fallen below the Threshold setting.

The range is from 0 dB (no gating) to infinity (fully gated, or no signal).

When Ducking is enabled, the Range control sets the level to which the signal will be reduced when open (triggered). For Ducking set this between -3 dB and -12 dB.

Gate/Duck Control

This toggle switch selects the Gate's mode of operation. In Gate mode, a signal above the Threshold will cause the Gate to open. In Duck mode, the audio passes unattenuated until the signal exceeds the Threshold. Ducking is mainly for applications such as voice-overs or removal of pops and clicks.

Bypass Control

The Bypass control bypasses the Gate.

Gate Envelope LED Meter

This traffic light-style LED shows the active state of the Gate envelope:

- When the Gate is closed, the red LED is lit.
- When the Gate is open, only the green and yellow LEDs are lit.
- When the input signal falls below the threshold, the yellow LED will light then fade over the duration of the release time.

In Duck mode, the green LED indicates an untriggered (resting) state.

Suggestions for Using the Gate

The fastest way to begin using the Expander is to choose one of the presets available in the Librarian menu. (See the *Pro Tools Reference Guide* for details.) Alternatively, create your own settings using the procedure that follows.

To use the Gate:

- 1 Bypass the Compressor by clicking the Compressor Bypass toggle.
- 2 Choose the key input mode (Side-Chain or Internal). If you select Side-Chain, from the Side Chain Input pop-up, choose the input/bus that carries the audio you want to use to trigger gating.
- 3 To hear the key input audio source you have selected to control gating, click Key Listen.
- 4 To filter the key input so that only certain frequencies trigger the plug-in, set the LF Key Filter and HF Key Filter controls to the desired frequency range.
- 5 Begin playback. Gating is now controlled by the input/bus you chose as a key input.
- 6 Select the desired amount of reduction using the Range control. Typically, set this fully counter clockwise.
- 7 Set the Attack, Hold and Release controls. For material with long legato release, use a long Release time. For material with a lot of low frequency content, use a slow Attack.
- 8 Adjust the Threshold control until the the vertical VU meter and the LED meters, show gating activity. As a rule, the Threshold should be about 3 dB below the average input level to see and hear the dynamic processing.

Additional Tips for Effective Gating

Initially, set the LF Key Filter fully counter-clockwise and the HF Key Filter fully clockwise. This lets you hear the full audio spectrum of the key input. Set the Range control fully counter-clockwise and Key Listen to Normal.

With the Release control set at its midway position, and with suitable program material fed into the Gate module, increase the Threshold level from its counter-clockwise position until the Gate starts to operate. This will be indicated by the LEDs. Pauses in the program should now be silent. If the Threshold setting is too high, the Gate will start to cut out desired audio. If so, adjust it as low as possible.

If the ends of sounds are obviously being truncated, a longer Release time may help. On the other hand, if unwanted noise is audible after the desired audio has ended, a shorter Release time is more appropriate.

Filtering Out Noise

There may be circumstances when the program material contains unwanted random noise or other sounds. For example, in a multi-miked drum kit set up, hi-hat will inevitably leak into the snare microphone, snare drum will leak into the kick drum microphone, and so on.

Similarly, when processing audio recorded on location, you may experience problems due to wind or traffic noise or close-by conversation. If the unwanted noise is different in pitch to the desired audio, it is often possible, using Key Listen, to use the filters to tune in to the wanted sound while excluding as much of the unwanted sound as possible. Used carefully, these filters can significantly decrease false triggering of the Gate.

Adjusting Attack Time Effectively

The Attack control has a very wide range. At its fastest, it can open instantaneously. Conversely, setting the Gate attack time too fast on material with a slow or moderate attack can cause clicks, particularly if the Threshold has to be set high because of excessive background noise.

This is a common problem with noise gates, especially when processing low-frequency audio such as bass guitar or bass drum. With a high threshold, a low frequency sine wave will be ignored as the signal starts from its zero level point.

As this wave climbs towards its peak, the level will suddenly exceed the threshold setting. At this point a very fast attack rate will switch the signal through the noise Gate with such a steep (almost vertical) leading edge that the low frequency sound will have a single high frequency square wave added to its first cycle, causing a click.

In cases like these, start with a fast attack time and moderate threshold, then gradually lengthen the attack time until the click disappears when the Gate opens.

Performing Ducking

Probably the most common form of Ducking is that used by radio announcers, whereby the volume of the background music being played is dropped, enabling them to speak over it. In Duck mode the Gate module can perform this effect. The music signal is routed to the input and the announcer's microphone signal is fed into the key input. (Be sure to set the key input to Side-Chain.)

The Range control is used to set the level to which the music will drop when the Ducker is triggered from the key input. The envelope controls determine the rate at which the level will drop and then recover. It is usual to select a medium to fast Attack time, so that the music level drops rapidly as soon as the announcer begins to speak—with a slow Release time of a second or so.

This will bring the music level back up slowly and smoothly. Some Hold time will help prevent chattering, when the voice on the key input pauses to breathe. This technique can also be used to reduce the level of other instruments during a solo.

Besides voice over applications, the Duck function of the Gate module can also be used to treat a signal where the peaks are too loud and require attenuating. In this application, Duck and Side-Chain key input modes should be selected, and the Range control adjusted to give the desired attenuation to signals above the Threshold setting. In extreme cases, the ducking action may be used to attenuate signal peaks, and by careful use of the filters, it may be possible to remove a snare drum from a drum mix or clicks and pops from a recording.

For most ducking applications, the lowest practical Threshold setting must be used.

Using a Stereo Gate

When using the Gate on a stereo signal, be aware that the control signal is derived by averaging the left audio channel with the right audio channel. Where one channel differs significantly from another in a stereo track, better results may be obtained if the channels are treated as two mono channels. (For a side-chain key signal, the control is always a mono signal.)

By setting up a stereo plug-in with one channel in Gate mode and the other in Duck, the envelope controls can be used to create interesting triggered panning effects, simply by feeding a mono signal into left and right channels and setting the Range control to maximum attenuation.

Difficult Material To Gate

As with any Gate, noise can only be removed during pauses in the desired material. If noise contamination is serious enough to be evident even during moderately loud program material, simple gating will do little to help. In fact, the very fact that the Gate produces silence during pauses can make the noise content of the program material even more apparent. In extreme cases, restricting the Range of the Gate to about -15 dB will adequately reduce noise during pauses but not sufficiently to cause an unacceptably dramatic change in noise level as the Gate opens and closes.

Creative Use of the Key Input Filters

The key input filters in the Gate may also be used to good effect in situations where the desired audio does not occupy the full audio spectrum. Conventional equalizers seldom have a sharp enough response to remove unwanted noise without also removing desired audio.

Used with electric guitar, this produces little below 100 Hz or above 3 kHz, so setting the Gate to Key Listen mode will enable you to use the filters to exclude much of the amplifier hum at the low end and hiss at the top end while having little effect on the sound of the guitar. The same is true for acoustic guitar. The filters can be used to reduce fret noise or a player's breathing.

Other applications of the filters include removing unpleasant overtones from direct-injected instruments and warming up digital synthesizer sounds.

Tips For Using Key Inputs and Key Input Filtering

Complicated Keying

For a more intricate and musical key input, combine several tracks together by bussing them to Auxiliary Inputs.

Leaving Key Listen Enabled

You can use the Gate as a simple filter by enabling Key Listen.

Key Filter Propagation Delay

Key input filtering with high frequency attenuation can cause a slight delay in the time the Gate takes to trigger. Under most circumstances this will be imperceptible. However, when transient sounds are being processed with the HF Key Filter control set to a very low value, some degradation of the attack transient may become apparent.

Consequently, always set the HF Key Filter control to the highest possible value when processing percussive sounds and set the Threshold as low as possible.

Cleaner Keying

It is often useful to use a Drawmer Dynamic plug-in to process the key input before it is used. Good results can be achieved by using an Expander (with the Compressor bypassed) on the key input source. This will give the key input source a more accentuated difference between

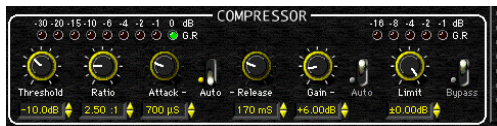
program and silence. With a cleaner key input, any associated gating will be more defined, and the Gate's Threshold settings will be easier to optimize.

The Compressor Module

The Compressor, which appears in both the DrawmerECL and DrawmerGCL plug-ins, is based on Drawmer DL241 Compressor/Limiter hardware unit.

Features

- ◆ Wide Threshold range for accurate compression
- ◆ Auto-adaptive Attack and Release for a more musical response
- ◆ Adjustable Ratio, ranging from very gentle compression to absolute Limiting
- ◆ Soft knee for progressive and unobtrusive compression
- ◆ Automatic Gain Make-up calculates the most suitable output Gain position for maximum data dynamic range
- ◆ Gain reduction meter



Compressor

The Compressor combines aspects of both traditional ratio-style compressors and soft-knee compressors, making it equally adept at creative work and subtle level control. Traditionally, soft-knee compressors have been preferable for subtle level control where the original sound is

changed as little as possible. Ratio-type compressors are generally considered better suited to creative applications where large amounts of gain reduction are required.

See “Using the Compressor Module” on page 24 for more information on using the Compressor module.

Compressor Parameters

Threshold Control

The Threshold control determines the input level above which gain reduction will be applied. Threshold range is from -64 dB to $+0$ dB. Soft knee compression takes place for signals exceeding the threshold level by up to 10 dB. Above this level, conventional ratio compression is applied.

Ratio Control

The Ratio control sets the compression ratio applied after the 10 dB soft-knee region of the Threshold is exceeded.

Ratio ranges from 1.1:1 to infinity. This allows hard limiting with adjustable attack and release.

Attack Control

The Attack control sets the rate at which the Compressor will respond to input signals that exceed the Threshold level setting. Attack ranges from 100µs to 100 ms.

When Auto Attack and Release is enabled, the control knobs have no effect.

Auto (Attack & Release) Switch

This toggle switch disables the Attack and Release rotary controls and instead optimizes the Attack and Release times to suit the dynamics of the material being processed.

Enabling this setting will often produce the subtlest level control on signals with widely varying dynamics or complete mixes.

Release Control

The Release control sets the rate at which gain returns to normal after the input signal level has fallen below the Threshold. Release range is from 50 ms to 5 seconds.

With very long release settings the Compressor may not have enough time to recover between the signal peaks.

With very short release settings low frequency signals will have a tendency to distort as the Compressor tries to release on the signal sine wave.

Gain Control

The Gain control has two functions, depending on the current state of the Auto Gain Make-up toggle switch. When Auto Gain Make-up is on, the control has a center-zero and is used as a fine trim for optimum output level. This should be centered at 0 dBfs, but can be reduced up to 9 dB, or driven harder, in which case the signal will hit the Limiter.

When Auto Gain Make Up is turned on, the gain control becomes a ± 9 dB trim. In manual mode, up to 36 dB of gain compensation can be added for level changes caused by Compression.

In the signal path, this control comes before the Peak Limiter detector. This fact should be taken into account when setting the Peak limiter threshold. Driving the gain too hard will often produce excessive limiting.

Auto Gain Make-Up Switch

With Auto Gain Make-Up on, Gain Make Up is adjusted automatically when the Compressor's Threshold, Attack and Ratio or Limiter Threshold are adjusted, so that the output level is as close as possible to the Limit Threshold.

▲ *When set to extremes, the Auto Gain Make-up feature cannot restore enough gain to make back all the level that would be required to repair excessive Compression.*

Compressor Gain Reduction Meter

This nine-element LED-style meter indicates from 0 dB to 30 dB of gain reduction.

Limit Threshold Control

The Limit Threshold control sets an absolute limit in decibels that the output signal is not allowed to exceed. This control is normally left in its fully clockwise position, where preventative limiting will sometimes occur with audio material containing high level peaks.

The Compressor Gain control should be used to ensure that the Peak Limiter operates rarely, if at all. Alternatively, you can deliberately drive it into limiting for creative effects.

Limit Gain Reduction Meter

This five-element LED-style meter indicates from 1 dB to 16 dB of gain reduction. The meter scale has been designed so that more sensitive amounts of limiting are displayed, rather than the maximum available.

Bypass (Compressor and Limiter) Switch

This toggle switch bypasses the Compressor and Peak Limiter. Normally it is used to compare the unprocessed signal with the processed signal.

Additional Suggestions for Using the Compressor

Setting up the Compressor is simpler if the Expander or Gate is initially set to Bypass and the Peak Limiter threshold set to maximum. This lets you adjust the Compressor in isolation.

Ratio Amount

The Ratio setting depends on how much the signal dynamics need controlling. As a rule, higher ratios provide a higher degree of control but also tend to be more audible in operation when high levels of gain reduction are required. The soft-knee feature of the Compressor makes this far less pronounced. Overall, a higher ratio can be used than on conventional compressors without compromising the sound quality.

Effective Gain Reduction

If the Attack & Release switch is set to Auto, setting up is simply a matter of adjusting the Threshold control until the desired amount of gain reduction occurs. You can judge this partly by ear and partly by observing the gain reduction meter.

A maximum gain reduction of between 8 dB and 12 dB is usually adequate. If more gain reduction is necessary, consider applying compression during recording and then further compression while mixing.

With Auto Gain Make-up disabled, rotate the Gain control until as near to 0 dB (full scale) signal output is seen at the VU meter. For greater simplicity, select Auto Gain Make-Up.

Background Noise

Compression during a mix increases the subjective level of background noises during pauses and quiet passages. Unless the noise problem is serious, the Expander can attenuate this noise to a very high degree, without compromising the desired audio signal.

Attack Times

The longer the attack time, the longer the Compressor takes to respond to increases in signal level and a slow attack time is often used to accentuate the beginning of percussive or plucked sounds such as drums, basses and guitars. A long attack time can also permit peaks to pass unattenuated. The limiter will pick these up, so it is quite common with slow attack times to see increased limiter activity. A fast attack time will bring the input signal under control very quickly.

Pumping

Pumping refers to heavy compression with incorrectly set envelope parameters. This results in very audible gain changes when the compressor attacks and releases. It is often an indication that the release time is too long. Release time should be set short enough so that the gain has returned to normal before the next signal peak occurs, and, in general, it should be set as short as possible before audible gain pumping occurs.

In most cases, an output of 0 dBfs is the optimum output level. Lower output levels can be set using the Limiter Threshold. You might want to do this so that later inserts can better receive

an optimized signal level at their input. If so, set the Peak Limiter Level to the desired output value then adjust the Compressor Auto or manual Gain control to ensure minimum Limiter activity.

Peak Limiter Bypass

The Peak Limiter has no bypass control. However, turning the Level control fully clockwise will prevent virtually all limiting. To use the Limiter while effectively bypassing the Compressor, turn the Compressor Threshold fully counter clockwise to its maximum of +0 dB. Then set the Ratio to its lowest setting of 1.1:1 if Gain Make-Up is set to manual. Set the Gain to 0 dB if Auto Gain is enabled.

Compensating for Apparent Dullness in Compressed Material

Compression can sometimes seem to have the effect of dulling audio material. Most of the energy in typical broadband music is contained within the bass range. This high energy causes the Compressor to operate, causing any quieter, high frequency sounds occurring at the same time to be reduced in level. That is why the cymbals and hi-hats in a heavily compressed drum track seem to dip in level whenever a loud bass drum or snare drum beat occurs.

The solution is to use less compression or increase the attack time to allow the leading edge of the brighter sounds to pass through the Compressor before gain reduction occurs. Though the semi-soft-knee compression systems used in Drawmer Dynamics modules tend to minimize this effect, in extreme cases, it may be necessary to add a little artificial brightness to the processed sound using equalization or some form of exciter.

The Limiter

If the Compressor module is used with higher ratios, it will function as a Limiter. In addition to this feature, there is a separate auto-adaptive Peak Limiter. This not only catches any peaks that a slow Compressor attack might pass through unprocessed, but also lets the user set an absolute output signal level that will not be exceeded.

Limiting is extremely valuable in digital recording where an absolute maximum recording level exists. When overdriven with Gain, it can also be used creatively to produce deliberate level-pumping effects.

Meters and Indicators

Drawmer Dynamics provides several types of LED-type signal meters and indicators.

Peak Input LED

The Peak Input LED indicates peaks in input signals. At 1.0 dB below digital full scale the LED is amber. At -0.01 dB, (just below full scale input) it is red. If the Peak Input LED frequently flashes red, the input signal is clipping and should be reduced.



Peak Input LED

VU Meter

The sixteen-element LED VU Meter shows output levels after processing. Metering ranges from 60 dB below full scale to 0 dBfs. Green LEDs indicate levels below -4 dB. Yellow LEDs indicate levels from -3 dB to -1 dB. An amber LED indicates -0.5 dB and turns red for peaks held at 0 dBfs.



VU meter (stereo)

Stereo Input Balance

This control, which appears only when Drawmer Dynamics is used in stereo, lets you correct an imbalance between stereo input images without introducing any gain. (Stereo dynamic control is best achieved with a mix that is equally centered.)



Stereo Input Balance control

The LEDs show relative input balance and how far off center the incoming stereo mix is. A perfectly matching stereo input should produce virtually no LED activity, regardless of audio level.

When centered, the Stereo Input Balance control has no effect. Moving the control to the left attenuates the right input signal by up to 6 dB and pans the image to the left. Moving the fader to the right attenuates the left input signal by up to 6 dB and pans the image to the right.

Peak input LEDs appear at both ends of the meter.

chapter 4

Using Drawmer Dynamics

Drawmer Dynamics is a real-time TDM plug-in. It processes audio non-destructively in real time. It does not alter the original source audio, but only applies its effects during playback.

Using Plug-Ins as Inserts

To use the Drawmer Dynamics plug-in, you must insert it in-line on an audio, Auxiliary Input, or a Master Fader track.

When more than one insert is used on a track, they process the audio in series, each effect being added to the previous one, from top to bottom in the Mix window.

Pre-Fader Operation

Drawmer Dynamics functions as a *pre-fader* insert, meaning that its level is not affected by a track's volume fader (except when used on a Master Fader).

For this reason, clipping can occur if you boost its gain to extremes. This is particularly true on tracks recorded at high amplitude. Watch on-screen metering to identify and rectify clipping if it occurs.

Inserting Drawmer Dynamics on a Track

To use Drawmer Dynamics in a Pro Tools session, add it to a track as an insert.

To show inserts in the Mix window:

- Choose View > Mix Window > Inserts.

To insert Drawmer Dynamics on a track:

- Click the Inserts selector on a track and select the plug-in that you want to use.

To remove Drawmer Dynamics from a track:

- Click the Insert selector and choose No Insert.

Using The Gate Module

The Gate is part of the DrawmerGCL plug-in.

Using the Key Side-Chain Circuit

The DrawmerGCL features internal and external Key side-chain capabilities. The side-chain circuit takes an internal or external Key input and uses that source to trigger affect the gate's behavior. Use the internal low- and high-pass Key filters to take advantage of frequency-conscious gating.

You can use the external sidechain feature to trigger the gate from an external source such as another mic or instrument.

Using the Internal Key Filters

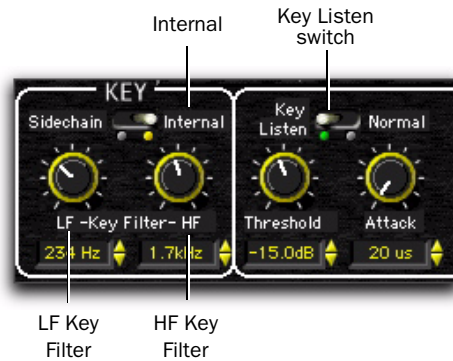
A common production technique is to use Key filter controls to filter out specific frequencies from triggering the gate's threshold.

For example, hi-hat bleed into a snare mic is a common problem. If you try to gate out the hi-hats, you might have to set a threshold so high that some of the snare drum's hits are inaudible.

You can use the DrawmerGCL to keep the hi-hat (which operates at a higher fundamental frequency than a snare drum) from opening the gate, which allows you to set the gate's threshold lower and preserve all of the drum hits.

To use the DrawmerGCL to gate out hi-hats from a snare track:

- 1 Insert the DrawmerGCL on the snare drum track.
- 2 Ensure the Key Input selector is set to No Key Input.
- 3 Set the Key section to the Internal setting.



Key filters section

- 4 Solo the snare drum.
- 5 Begin playback.
- 6 Adjust the threshold of the gate so you can hear gating.
- 7 Click Key Listen to listen to how the filters are acting on the snare drum.
- 8 Adjust the HF Key Filter control to around 1kHz, so that you hear mostly snare drum. You will hear the hi-hat slowly disappearing from the gated snare channel.
- 9 Click the Key Listen switch to normal.
- 10 Fine-tune the threshold, attack, and release so that all snare hits are preserved, but the hi-hat is effectively gated out of the snare mic.

Using a Key Input for External Side-Chain Processing

With external side-chain processing, a plug-in's detector is triggered by an external signal (such as a separate reference track or audio source) known as the *key input*.

An effective use of this feature is to use the snare drum as the trigger for opening gates inserted on room mics, giving the snare an extra added “pop.”

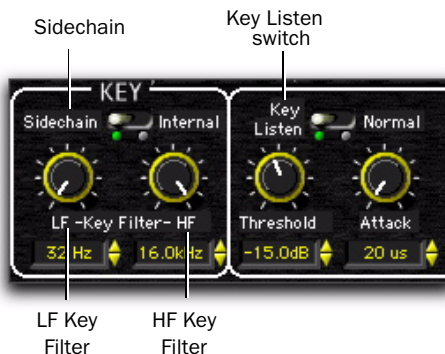
To use a snare to trigger gating on a room or ambient mic track:

- 1 Insert the DrawmerGCL on your room or ambient drum mic tracks.
- 2 On the snare track, click the send selector to choose any open bus send.
- 3 Set the snare's output bus send that you selected to “0.”
- 4 On the room or ambient mic track, click the Key Input selector and select the bus carrying the audio from the snare track.



Selecting a Key Input

- 5 Set the Key section to the Side-Chain setting.



DrawmerGCL Key filter controls

- 6 Click Key Listen to hear the audio source (in this case, the snare drum) you have selected to control the side-chain input.
- 7 Begin playback. Gating is now controlled by the snare, which you chose as the key input.
- 8 Adjust the Noise Gate's Threshold to fine tune side-chain triggering.
- 9 Adjust other parameters to achieve the exact effect you want.

Using the Expander Module

The Expander Module is part of the DrawmerECL.

The fastest way to begin using the Expander is to choose one of the presets in the Librarian menu. (See the *Pro Tools Reference Guide* for details.) Alternatively, create your own settings using the procedure that follows.

To use the Expander:

- 1 Bypass the Compressor by clicking the Compressor Bypass toggle.
- 2 Select the desired amount of reduction using the Range control.
- 3 Set the Attack and Release controls based on the character of the audio material you want to expand. For material with long, legato release, set a long Release. For material with a lots of low frequency content, set a slow Attack. For sharp, percussive sounds, set a short Attack.
- 4 Set the Ratio control based on the character of the audio material. Try a maximum setting of 2.5:1 for vocals, and higher ratios for dynamic, full mix material.
- 5 Adjust the Threshold control until the vertical VU meter and the Expander Gain Reduction (GR) meter begin to light.

As a rule, the Threshold should be between 6 dB to 10 dB below the average input level. Use a section of audio material with pauses and adjust the threshold to be as low a dB level as possible while still attenuating the noise during pauses. Listen carefully to how the sounds come in after the pauses and how cleanly they fade away again. If the Expander changes the sound in an unacceptable way, the Threshold is probably set too high.

Using the Compressor Module

The Compressor appears in both the DrawmerECL and DrawmerGCL plug-ins.

The fastest way to begin using the Compressor is to choose one of the presets available in the Librarian menu. (See the *Pro Tools Reference Guide* for details.)

Alternatively, create your own settings using the procedure that follows.

To use the Compressor:

- 1 Bypass the Gate or Expander by clicking their Bypass toggle.
- 2 Turn on Auto Attack & Release.
- 3 Turn on Auto Gain Make-up.
- 4 Set the Limiter control fully clockwise.
- 5 Set the Ratio control. For vocals, try 2.5:1 or less. For full mixes use even less. For dynamic single tracks, use more.

Adjust the Threshold control until the vertical VU meter and the Compressor Gain Reduction (GR) meter show activity. As a rule, the Threshold should be 6 dB to 10 dB below the average input level to hear much change.

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

A *DSP tables show the theoretical maximum performance when no other plug-ins or system tasks (such as I/O) are sharing available DSP resources. You will typically use more than one type of plug-in simultaneously. The data in these tables are provided as guidelines to help you gauge the relative efficiency of different plug-ins on your system. They are not guaranteed performance counts that you should expect to see in typical real-world sessions and usage.*

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).


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

Using Multi-Mono Plug-Ins on Greater-Than-Stereo Tracks

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 (Window > 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.*

Drawmer Dynamics DSP Requirements

The Drawmer plug-ins have the following DSP requirements:

HD Accel Card

Table 1. Maximum instances of 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		Compatible DSP Chips per HD Accel Card
Plug-In	Mono	Stereo	Mono	Stereo	
DrawmerECL	8	4	4	2	9
DrawmerGCL	8	4	4	2	9

HD Core and HD Process Cards

Table 2. Maximum instances of 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		Compatible DSP Chips per HD Core or HD Process Card
Plug-In	Mono	Stereo	Mono	Stereo	
DrawmerECL	4	2	2	1	9
DrawmerGCL	4	2	2	1	9

appendix b

DSP Delays Incurred by TDM Plug-Ins

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

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.

This signal delay 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.


 *Pro Tools systems provide automatic Delay Compensation (and other methods) to compensate for signal processing delays. For detailed information, see the Pro Tools Reference Guide.*

Table 3 shows the delays inherent in each Drawmer Dynamics plug-in.

Drawmer Dynamics DSP Delay

Table 3. Samples of delay incurred by each TDM plug-in on Pro Tools|HD cards

Plug-In	Samples of Delay on Pro Tools HD Cards
DrawmerECL	7
DrawmerGCL	7

appendix c

Drawmer Dynamics Demo Sessions

Several demo sessions are included with Drawmer Dynamics. These sessions illustrate how to use the plug-in during typical recording scenarios.

Using the Demo Sessions

Before opening a demo session, you must have already installed and authorized the Drawmer Dynamics plug-in.

To open a demo session:


- 1 Locate and open the demo sessions folder (Digidesign/Drawmer Dynamics/Drawmer Dynamics Demo/Demo Sessions).
- 2 Double-click the desired demo session.
- 3 When the session opens, press the Spacebar to begin playback.
- 4 Click Bypass to compare the track with and without dynamics processing.

About the Demo Sessions

Following are brief descriptions of each demo session and the features they illustrate.

“Gated Tones” Demo

This session illustrates keying of two different tone bursts from an existing short drum loop using the Gate. The three-channel session uses two Gates. The key input is from the original drum track.

 *The unprocessed audio in this session is very loud. Turn down your monitoring system if you plan to bypass the Gate.*

“Snare” Demo

This session illustrates a gated reverb effect using the Gate and a modified variation of “Gate&Comp Staccato” setting with a reduced Gate Threshold to compensate for low signal level. Notice how the reverberated sound is shortened. Imagine that the reverb could also be high level noise. Gate Release greatly affects the output.

“Noise Removal” Demo

This session illustrates how to use the Expander to effectively remove excessive background hiss from a short drum loop. Use the Bypass button to compare the processed and unprocessed audio.

“Wrong & Right” Demo

This session illustrates the right and wrong way to use a Gate. The same bass guitar audio appears on two tracks. Both tracks have the same Gate assigned, but each has differing parameter settings. Notice that using the wrong Threshold, Attack, Hold and Release settings can give very poor results from low frequency signals. Use Solo and Mute to compare the effect of the right and wrong settings.

“VoxOver” Demo

This session illustrates how to use the Gate to perform ducking. Note how the levels of the music tracks are attenuated whenever the vocal track comes in. This technique is frequently used in radio, film, and commercial voice-overs, or anywhere that automatic control over background pad level is required.

Note that one audio source (the vocal track) is used to trigger two separate mono backing tracks by positioning the key selector switch centrally. In reality, the amount of ducking in this demo is excessive, and often as little as 3 dB of attenuation may be sufficient.

The main vocal track utilizes the Expander to remove headphone spill/background noise.

Try inverting the Gate/Duck switch of one of the Gates. This will result in distinct panning of the outputs during the duration of the vocal track.

“Extra-Clean-Key & Drum” Demo

This session illustrates keying of a short drum loop from a composite track of mixed sine wave tones. The tone mix is first cleaned using the Expander assigned to the first mixer insert button. This audio is then used as a key input. The result is a cleaner key signal for the Gate.

This demo includes automation that shows how you can vary the Threshold parameter to ignore a key input.

“Clean & Dirty Drums” Demo

This session illustrates three different styles of processing using both the Gate and the Expander. There are three audio tracks, each of which demonstrates a different effect:

- ◆ The left audio channel (“Rhythm <L”) carries the original “scratchy” audio. The DrawmerGCL plug-in is loaded in a bypassed state. Adjusting the Gate Threshold to about -20 dB will allow the rest of the drum track to pass through the plug-in.
- ◆ The right audio channel (“Rhythm >R”) carries the audio after being bounced and processed. This channel has a DrawmerECL plug-in that once enabled, demonstrates Upward Expansion. This shows how to add more life to a track that suffers from an over-squashed dynamic range.
- ◆ The center channel carries audio that has been over processed. This shows the kind of effect that can be achieved with this type of double-pass processing.

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