GTX44

Four Channel Gate/Expander

User's Manual

VERSION 1.1

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Table of Contents

1.1 INTRODUCTION

Thank you for purchasing the PreSonus GTX44 four channel dynamics processor. This processor was designed using state of the art components to deliver crystal clear compression and limiting for an infinite period of time. We believe that it is an exceptional sounding unit as well as an exceptional value. Feel free to contact us at 1-800-750-0323 anytime for any reason whatsoever. We value your suggestions and your comments!

Please pay close attention to how you connect your GTX44 to your system. Improper grounding is the most common cause of noise problems found in studio or live sound systems. We urge you to at least scan this manual before hooking up your GTX44 to become familiar with its features and various applications.

Good luck and enjoy your GTX44!

1.2 FEATURES

The following is a summary of your GTX44's features:

Full Featured Gate/Expander

Each channel of yourGTX44 can be used as a frequency specific gate or expander, depending on your needs and settings.

Channel Linking

Using the Link function, you can link together two channels of the GTX44 for stereo operation. When linked, the processor follows the setting of linked channel to the left, which becomes the master. When two channels are linked the sidechains are summed.

Separate Bypass for Each Channel

All four channels have a separate bypass for listening to 'before and after' performance tests.

Insert Sidechain on Each Channel

Each channel of your GTX44 was designed with a special jack for spectral processing, and ducking applications. Sidechaining is useful for automatically ducking tracks behind a narrator for 'auto mixing' a service, broadcast or performance.

Duck Mode

Ducking lowers the level of the audio signal based upon the level of a second sidechain audio signal.

Balanced XLR and Unbalanced 1/4" Tip/Ring/Sleeve Input/Output

Your GTX44 accepts XLR connectors for balanced or a single 1/4" TRS for unbalanced inputs and outputs.

+4dBu or -10dBV Insert Switch

The operating level of your GTX44 ' S inserts can be switched between +4dBu (pro levels) to -10dBV (line levels) for ease of use with external equipment in any situation.

To Get Help

Call Us: 1-800-750-0323, 9AM to 5PM, CST
Visit our World Wide Web site: http://www.presonus.com
Email Us: presonus@presonus.com

2.1 FRONT PANEL BASIC LAYOUT

Notice that the front panel is divided into four identical sections. These are the four signal processing channels of the GTX44. Each channel contains:

Gate/Expander
Lo/Hi Filter
SideChain Monitor
Link & Bypass Control
Duck Mode

2.2 GATE/EXPANDER CONTROLS

Lo/Hi Filter

There are many situations, especially with drums, when other instruments open up the gate instead of the instrument being gated. For example, tom-tom mics are generally placed very close to the cymbals on a drum kit, creating the possibility of the cymbals opening up the tom-tom gates. The Lo/Hi Filters allow the user to specify which frequencies are 'eligible' for gating. Therefore the cymbals may be removed from 'eligibility' by using a high cut filter to filter out the high frequencies of the cymbals. The gate will no longer open up during cymbal crashes, leaving the low frequencies of the tom-tom to properly open the gates.

Threshold

The gate threshold sets the level at which the gate opens. Essentially, all signals above the threshold setting are passed through unaffected, whereas signals below the threshold setting are reduced in level by the amount set by the ratio and/or range control.

Ratio

The expansion ratio sets the amount of noise reduction applied to a signal once the signal has dropped below the expansion threshold. For example, a 2:1 expansion ratio attenuates a signal 1dB for every 1dB it drops below the threshold. Ratio's 4:1 and higher act like a noise gate. Note: The Range Control overrides the ratio control. For example: If the Expander calls for 40dB of attenuation but the Range is set to 20 dB of attenuation, the signal will be attenuated by 20dB.

Range

The range is the amount of gain reduction that the processor closes down to. Therefore, if the range is set at 0dB, there will be no change in the signal as it crosses the threshold. If the range is set to -60dB, the signal will be attenuated (reduced) by 60dB, etc.

Attack

The gate attack time sets the rate at which the gate opens. A fast attack rate is crucial for percussive instruments, whereas signals such as vocals and bass guitar require a slower attack.

Hold

Hold time is used to keep the gate open for a fixed period of time following the signal going below the gate threshold. This can be really useful for effects such as 'gated snare' where the gate remains open after the snare hit for the duration of the hold time then abruptly closes. Hold is only available when the ratio knob is set to GATE.

Release

The gate release time determines the rate at which the gate closes. Release times should typically be set so that the natural decay of the instrument or vocal being gated is not affected. Shorter release times help to clean up the noise in a signal but my cause 'chattering' in percussive instruments. Longer release times usually eliminate 'chattering' and should be set by listening carefully for the most natural release of the signal.

SC Mon

The SideChain Monitor allows you to hear the frequency range that the Lo and Hi Filter are operating on.

Link

Using the Link function, you can link together two channels of the GTX44 for stereo operation. When linked, the processors follow the setting of linked channel to the left, which becomes the master. Remember, when two channels are linked, the sidechains are summed!

Duck

Ducking lowers the level of the audio signal based upon the level of the sidechain audio signal. If the unit is in gate mode, then you can DUCK according to what the range setting.

A typical application is paging: A ducker senses the presence of audio from a paging microphone and triggers a reduction in the output level of the main audio signal for the duration of the page signal. It restores the original level once the page message is over.

Bypass

All four channels have a separate bypass for listening to 'before and after' performance tests.

2.5 BYPASS & LINK

Bypass

Activating the bypass effectively removes all processing being performed by your GTX44 and returns the signal to unity gain. You should use bypass often when setting up your GTX44 to compare the 'before and after' results of the signal processing affecting your audio signal. Bypass affects the gate and all its functions. When in Bypass the Link function is still engaged, but both channels are set to Bypass Mode.

Link

When the Link button is pushed in, the channel to the left becomes the master controller of both channels. The channel to the right's controls become disabled and metering becomes summed left and right, i.e. stereo mode. IMPORTANT: When the two channels are linked (link button pushed in), all of the right channel's controls are inactive.

2.6 PATCH PANEL (BACK)

Input/Output

The input/output jacks are unbalanced tip/sleeve or ring/sleeve connectors or balanced XLR connectors. The XLR inputs/outputs can handle up to +24dBu unbalanced or balanced.

+4/-10 Switch

This switch adjusts the insert operating level of the sidechain of your GTX44 when it is connected to line level (0dB = -10dBV) gear. With the switch in the '-10' position, the sidechain signal is raised internally. The main audio path is not affected, only the processing level is. When the switch is in the '+4' position, the signal is not changed since this matches the internal sidechain operating level of your GTX44. The +4/-10 does not change the audio level through the GTX44. . It is important to remember that Pro Gear has a hotter +4 level, whereas consumer gear runs at the lower level of -10.

Sidechain

It is sometimes impossible to set a noise gate to open precisely when an instrument sounds in a noisy environment. Most gates feature an external gate key that will allow the gate to be opened using an external signal, in effect 'triggering' the gate to open. For example a bass guitar gate might be 'triggered' using the kick drum to tighten up the low end of a mix. Or a snare track might be 'triggered' using a click track or sequencer to place the snare right in time with the music.

2.7 POWER

Power Connection

The power jack on your GTX44 accepts a standard IEC cord like those found on most computers and professional recording equipment. Your GTX44 contains a custom built in power supply, no wall wart. This way you can be assured of clean power combined with rugged construction that has been designed to last!

Power Switch

I = ON, 0 = OFF.

3.1 BASIC IDEAS AND APPLICTIONS

Why Do You Need Noise Gates?

Problems arise when there is noise or instruments in the background of the vocal mic that became more audible after the lower end of the dynamic range was raised. (air conditioner, loud drummer, etc.) You might attempt to mute the vocal between phrases in an attempt to remove the unwanted signals; however this would probably be disastrous. A better method is to use a noise gate. The noise gate threshold could be set at the bottom of the dynamic range of the vocal, say -10dBu, such that the gate would 'close' out the unwanted signals between the phrases. If you have ever mixed live you know well the problem cymbals can add to your job by bleeding through your tom mics. As soon as you add some highs to get some snap out of the tom the cymbals come crashing through, placing the horn drivers into a small orbit. Gating those toms so that the cymbals no longer ring through the tom mics will give you an enormous boost in cleaning up the overall mix.

Expansion

There are two basic types of expansion: *dynamic* and *downward*. Expansion increases the dynamic range or level of a signal after the signal crosses the expansion *threshold.* Dynamic expansion is basically the opposite of compression. In fact, broadcasters use dynamic expansion to 'undue' compression before transmitting the audio signal. This is commonly referred to as 'companding' or COMPression followed by expANDING. By far the most common use of expansion is *downward* expansion. In contrast to compression, which decreases the level of a signal after rising above the *compression threshold*, expansion decreases the level of a signal after the signal goes below the *expansion threshold*. The amount of level reduction is determined by the expansion ratio. For example, a 2:1 expansion ratio reduces the level of a signal by a factor of two. (e.g. if a level drops 5dB below the expansion threshold, the expander will reduce it to 10dB below the threshold.) Commonly used as noise reduction, expansion is very effective as a simple noise gate.

The major difference between expansion and noise gating is the fact that expansion is *dependent* on the signal level after crossing the threshold, whereas a noise gate works *independent* of a signal's level after crossing the threshold.

Noise Gating

Noise gating is the process of removing unwanted sounds from a signal by attenuating all signals below a set *threshold*. As described above, the 'gate' works independent of the audio signal after being 'triggered' by the signal crossing the gate threshold. The gate will remain open as long as the signal is above the threshold. How fast the gate opens to let the 'good' signal through is determined by the *attack* time. How long the gate stays open after the signal has gone below the threshold is determined by the *hold* time. How fast the gate closes is determined by the *release*. The range determines how much the gate attenuates the unwanted signal while closed.

Patching Using a Patch Bay

When using a patch bay to extend the GTX44's patch panel for easier access, the following should be considered:

1. Lowest noise is achieved when using balanced patch bays.
2. The input and output jacks should not be normalled (the send routed back to the return).
3. The sidechain jacks must be normalled.

Gating Drums or Percussion Instruments

Adjust the Gate on the snare to stop those other drums from 'bleeding' through the snare mic: Turn the gate release knob to about the middle position, turn the gate attack knob to fully counter-clockwise, set the gate range to -60dB, adjust the

gate threshold slowly clockwise until you begin to hear those other drums disappearing. Too high of a threshold setting might disrupt the snares natural sound; too low will let those other drums open the gate. You need to adjust the gate's threshold and release to suit your drumming taste.

This simple application applies to any percussive instrument of course. Experiment.

4.1 SPECIFICATIONS

Number of Channels	4
Dynamic Range	>115dB
Signal to Noise Ratio	>95dB
Headroom	+24dBu, Unbalanced; +24dBu Balanced
Frequency Response	10Hz to 50kHz
Gate Attack Range	10mS to 500mS
Gate Threshold Range	40dBu to +15dBu
Gate Release Time	0.01sec to 2sec
Gate Attenuation Range	0dB to -80dB
Input Impedance	10kOhms
Output Impedance	51 Ohms
THD + Noise	<0.05%
Gate Metering	-3dB to -30dB
Sidechain Output Impedance	51 Ohms
Sidechain Input Impedance	10kOhms
Internal Operating Level	+4dBu = 0dB
Sidechain Level	+4dBu or- 10dBV, Switchable
Input/Output Connectors	1/4", Tip / Sleeve, Unbalanced or XLR Balanced
Sidechain Connector	1/4", Tip Ring Sleeve
Power Supply	Internal, Linear Supply
Power Requirements	100/120/220/240VAC (Factory Configured)
Power	24 Watts
Weight	7 lbs.
Size	1U Rack

TROUBLESHOOTING

Ghost Meters

The inputs of the CL44 are not designed to be overdriven. In the event that you do overdrive the inputs on one or two channels, the meters of the other two channels (if not in use) may show activity. This “ghost activity” is not signal bleed, it is sidechain crosstalk. It will not change or affect the processing power or ability of your unit.

Installing the GTX44 into an Existing Rack

If you are installing your CL44 into an existing equipment rack, it may be necessary to purchase some additional cabling. Most dynamics processors use a 1/4” TRS Y shaped insert cable to connect to a console. The CL44 is designed to connect to a console using one 1/4” TRS cable. A 1/4” TRS Y male to dual female cable may need to connect the CL44 to an existing audio snake. Once the cabling is connected, you only need to press the FLIP switch if the sends/returns are not matched up properly.