t.c. electronic

ULTIMATE SOUND MACHINES

®

G-Natural

User's Manual

IMPORTANT SAFETY INSTRUCTIONS

The lightning flash with an arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

1 Read these instructions.
2 Keep these instructions.
3 Heed all warnings.
4 Follow all instructions.
5 Do not use this apparatus near water.
6 Clean only with dry cloth.
7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11 Only use attachments/accessories specified by the manufacturer.
12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13 Unplug this apparatus during lightning storms or when unused for long periods of time.
14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way,   such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Warning!
• To reduce the risk of fire or electrical shock, do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
• This apparatus must be earthed.
• Use a three wire grounding type line cord like the one supplied with the product.
• Be advised that different operating voltages require the use of different types of line cord and attachment plugs.
• Check the voltage in your area and use the correct type. See table below:

Voltage	Line plug according to standard
110-125V	UL817 and CSA C22.2 no 42.
220-230V	CEE 7 page VII, SR section 107-2-D1/IEC 83 page C4.
240V	BS 1363 of 1984. Specification for 13A fused plugs and switched and unswitched socket outlets.

• This equipment should be installed near the socket outlet and disconnection of the device should be easily accessible.
• To completely disconnect from AC mains, disconnect the power supply cord from the AC receptacle.
• The mains plug of the power supply shall remain readily operable.
• Do not install in a confined space.
• Do not open the unit – risk of electric shock inside.

Caution:
You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.

Service
• There are no user-serviceable parts inside.
• All service must be performed by qualified personnel.

EMC / EMI & CERTIFICATE OF CONFORMITY

EMC/EMI
This equipment has been tested and found to comply with the limits for a Class B Digital device, pursuant to part 15 of the FCC rules.
These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

For Customers in Canada:
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Certificate of Conformity
TC Electronic A/S, Sindalsvej 34, 8240 Risskov, Denmark, hereby declares on own responsibility that the following product:

> **G-Natural**
> *- Effects Processor for acoustic guitars*

that is covered by this certificate and marked with CE-label conforms with following standards:

EN 60065   Safety requirements for mains
(IEC 60065)   operated electronic and
           related apparatus for household
           and similar general use
EN 55103-1   Product family standard for
           audio,video, audio-visual and
           entertainment lighting control
           apparatus for professional
           use. Part 1: Emission.
EN 55103-2   Product family standard for
           audio, video, audio-visual and
           entertainment lighting control
           apparatus for professional
           use. Part 2: Immunity.

With reference to regulations in following directives:
73/23/EEC, 89/336/EEC

Issued in Risskov, June 2007
Mads Peter Lübeck
Chief Executive Officer

Congratulations on the purchase of your G-Natural. G-Natural is the world's first multi-effects processor for the serious acoustic guitar player.

With G-Natural you no longer have to put your guitar sound in the hands of the sound engineer or to put up with effects designed for electric guitars to boost your performance. It goes without saying that effects for electric instruments do not take the construction of a hollow body acoustic guitar into account.

G-Natural houses a suite of high quality effects fine-tuned for acoustic guitar. It's all you will ever need to cut through to your audience: Compression, EQ, Boost, Chorus, Detune, Vibrato, Tremolo, Flanger, Reverb and Delay.

With both a built-in mic preamp and standard line inputs you can choose between using a piezo or pickup system or miking your guitar with a condenser mic. Or why not do both and mix the signals inside G-Natural to get the best of both worlds?

G-Natural comes with 30 factory settings optimized for a wide variety of musical genres and playing techniques. The 30 user-customizable presets allow you to add that crucial personal touch to your sound.
G-Natural's mic pre can also be used for vocal performance. Just put G-Natural in Vocal mode and you automatically get a vocal strip EQ and compressor.

Topping an already packed feature list, a built-in tuner, digital I/O, expression pedal input and MIDI make G-Natural the number one multi-effects solution for the serious acoustic guitar player – all you need is a fresh set of strings, a load of killer tunes and you're good to go.
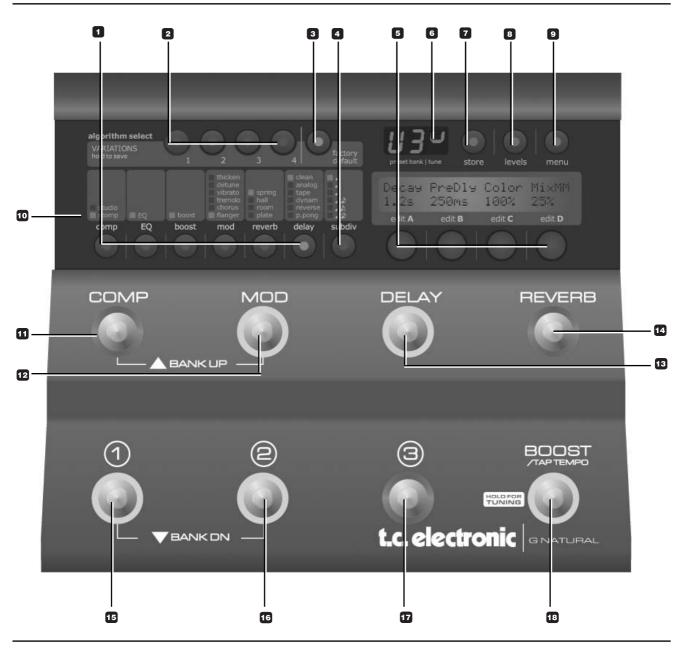
Features

- Floor-based multi effects processor
- 10 high quality TC effects tuned for acoustic guitar
- Mic preamp for vocals or guitar
- Built-in tuner and boost
- Road-ready and portable design

The current manual revision number is found at the bottom of page 3.
Latest manual revision can always be downloaded via www.tcelectronic.com.
To seek additional information and support please visit TC Support interactive
that also can be accessed via www.tcelectronic.com

OVERVIEW

1 - Effect Edit/Select buttons
Press once to enter edit mode for the current effect.
Press again to toggle between the different effect types.

2 - Variations
For each selected effect type, 4 instant variations can be stored. When creating new presets this function makes is very easy to combine your favorite reverbs with your favorite compression settings etc.

Example:
- Press COMP edit to enter the compression block.
- Edit the compression settings using encoders A-D.
- Now press and hold VARIATION key #1 to save this compression setting as one of your favorites. Note that the preset is not stored at this point, you have simply set up a favorite compression setting.
- Recall a different preset using the preset keys where you would like to apply this compression.
- Press COMP followed by VARIATION key #1.
- Your favorite compression setting #1 is now recalled into the current preset.

Each effect block can hold up to 4 variations!

3 - Factory Default
TC Electronic has predefined factory default settings for each algorithm. Press FACTORY DEFAULT to recall the default settings for the currently selected algorithm.

Example:
Assume that you have a very nice preset with a nice combination of compression, EQ, mod and maybe delay settings. However, you feel that you have edited the reverb parameters to a point where you find yourself a bit lost. - What would TC Electronic suggest?

- We assume that you are in reverb edit, thus the REVERB EDIT LED is lit.
- Press FACTORY DEFAULT.

Note that there is a factory default setting for each effect sub-type.

4- Subdivision
The subdivision parameter relates to delay effects only. It is used to calculate the actual delay time in relation to the tapped tempo.

Example:
Tapped tempo is often used with delay. Let us assume the tempo of the song is 120 BPM. Tap 1/4 notes.

If the selected subdivision is set to 1/4 note the actual delay time will be 500 ms.

If the selected subdivision is set to 1/8 note triplets the actual delay time will be 166 ms.

5 - Edit knobs A, B, C, D
Turn to adjust the parameters currently displayed above the knobs in the display.

6 - Numeric Display
The numeric display has three sections.

Left - Indicates "U" for user bank or "F" for factory bank. Only the user bank presets can be edited.

Middle - Indicates the current preset bank.
A "dot" indicates that the preset has been edited.

Right - Tuner indication.

Presets - G-Natural has 30 factory presets and 30 user preset locations.

7 - Store
Storing a preset can be done in two ways. We call them "Quick store" and "Normal store". "Quick store" is typically used when you have made changes to a preset and want to store the preset with the same name at the

OPERATION

same location. "Normal store" is used if you want to change preset location and maybe the name as well.

Quick store - press and hold STORE for 2 seconds. The preset is now stored at the current location.

📝 If you are trying to store a factory preset using "Quick store", you will automatically be directed to "Normal store" mode.

Normal Store - press STORE once:

Now the following controls are available:
- Encoder A selects preset location
- Encoder B selects preset name characters
- Encoder C changes characters
- Encoder D selects recall, delete or store mode

When selections are made press STORE to confirm.

8 - Levels
Output levels can be set for each preset. All other parameters in the levels menu are "global" parameters and do not change with presets.

9 - Menu
This menu holds important settings such as MIDI, routing, pedal settings and utility parameters. Please refer to the relevant manual sections for details.

10 - LEDs
The LEDs indicate the selected effect in each block.

11 - Comp
On/off switch for the compressor.

12 - Mod
On/off switch for the modulation block.

11+12
Press both switches at the same time to go up one bank.

13 - Delay
On/off switch for the delay block.

14 - Reverb
On/off switch for the reverb block.

13+14
Press both switches at the same time to go down one bank.

15 - Preset 1
Press to recall preset #1 in the current bank.

16 - Preset 2
Press to recall preset #2 in the current bank.

17 - Preset 3
Press to recall preset #3 in the current bank.
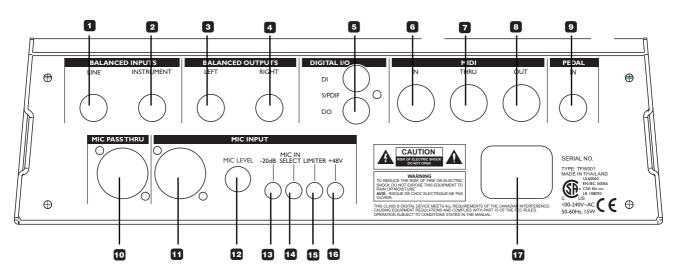
18 - Boost / Tap Tempo / Hold for Tuning
Via the footswitch parameter in the utility menu this switch can be set to act as either boost or tap tempo.

With the "Boost" function selected the entire signal can be boosted up to 10 dB. Max boost level is set via the levels menu. The boost level can be set for individual presets within the set max boost.

With "Tap Tempo" selected, the global tempo can be entered by tapping the switch.

Whether you are using tap tempo mode or boost mode for this switch the tuner mode can be accessed by pressing the switch for 2 seconds. In Tuner mode G-Natural can be set up to mute the outputs for convenient quiet tuning. This is setup in the Utility menu via the Output parameter.

1 - Line Input
Input for line instruments such as keyboards etc.
Connection type: 1/4" jack.

2 - Instrument Input
Input for:

- Guitar pedal or preamp
- Active pickups (guitar with batteries)
- Acoustic guitar with preamp
- Keyboard output

Connection type: 1/4" jack.

3/4 - Balanced Outputs
Balanced outputs on 1/4" TRS jack. These outputs may be connected directly to balanced mic inputs with 1/4"TRS to XLR adapters.

WARNING! When connecting the G-Natural outputs to microphone inputs on a mixing console, the phantom power for these channels MUST be switched off! Otherwise you may damage the G-Natural circuits.

5 - Digital I/O - S/PDIF
Sends and receives digital audio to S/PDIF standards on standard RCA connectors.

6 / 7 / 8 - MIDI In / Thru / Out
Standard MIDI interface.

9 - Pedal In
Several types of external pedals can be connected and used to control parameters.

- Connect an expression or a volume pedal to control e.g. volume
  For perfect response when using an expression or a volume pedal, the pedal must be calibrated. This is done via the pedal menu
- Via the pedal menu you can set up what parameter the expression/volume pedal should control

REAR PANEL VIEW

10 - Mic Pass Thru
This connects directly to the microphone input and is used to connect directly to a mixing console. When connecting microphones that require phantom power, you have the option of using the phantom power from either G-Natural or the mixing console.

WARNING! Please note that using phantom power from both the mixing console <u>and</u> G-Natural simultaneously will result in too much power and possible damage to the microphone.

11 - Mic Input
Balanced microphone input.

12 - Mic Level knob
Controls the input gain of the mic input.

13 - -20 dB button
Press to attenuate the mic input by 20 dB to handle e.g. high output condenser microphones.

14 - Mic In Select button
This switch enables the mic input. When not pressed (out position), G-Natural defaults to the line input.

15 - Limiter button
This enables the VOS™ optical limiter on the mic input.

16 - +48V button
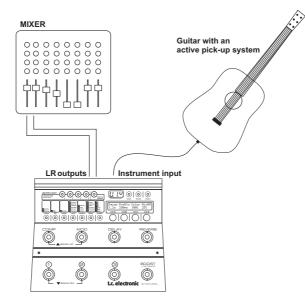This enables +48V phantom power on the mic input.

WARNING! Never plug single ended (unbalanced) microphones or instruments or signal processors (balanced or unbalanced) into the mic input if +48V phantom power is on.

17 - Power In
The switchmode power-supply accepts from 100 to 240VAC.

Guitar with piezo pick-up

This is a typical setup with a standard acoustic guitar with an active* piezo pickup system.

Connections
- Connect your guitar to the G-Natural's instrument input
- Connect L/R outputs to a mixer or to a dedicated acoustic guitar amp

NOTE When connecting the G-Natural outputs to microphone inputs on a mixing console, the phantom power for these channels MUST be switched off! Otherwise you may damage the G-Natural circuits.
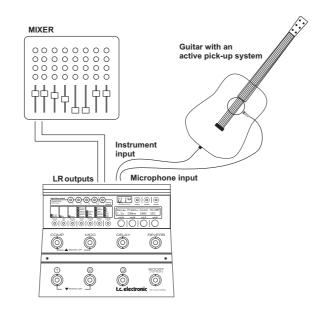
Basic settings
- Set input sensitivity via the Levels menu
- Select active effect pressing the COMP, MOD, DELAY and REVERB switches

* If the pickup system requires the use of a battery the system is active.

TYPICAL SETUPS

Guitar with piezo pick-up and dynamic microphone

It is a generally accepted fact that the best way of capturing the sound of an acoustic guitar is done using a dynamic or condenser microphone. However, in live situations where the sound level on stage can be loud it is not advisable to only use these types of microphone. If conditions allow it, a combination of an active* piezo system and a dynamic/condenser microphone may be the perfect solution. This scenario is handled perfectly with G-Natural.

Connections
• Connect the output of your guitar's piezo pickup to the instrument input of G-Natural
• Connect the microphone to the mic input of G-Natural
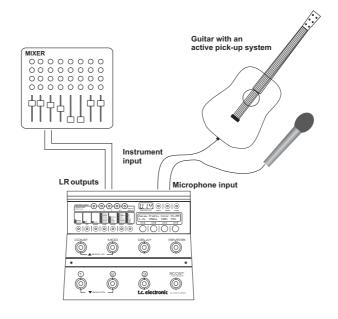• Connect L/R outputs to a mixer or to a dedicated acoustic guitar amp

WARNING! When connecting the G-Natural outputs to microphone inputs on a mixing console, the phantom power for these channels MUST be switched off! Otherwise you may damage the G-Natural circuits.

Basic settings
• If the connected microphone is a condenser type, phantom power must be switched on
• Set input sensitivity via the levels menu.
• Select active effect pressing the COMP, MOD, DELAY and REVERB switches
• G-Natural features separate EQ and compression settings for mic and instrument inputs

* If the pickup system requires the use of a battery the system is active.

Guitar with piezo pick-up + vocal microphone

As explained in the previous example G-Natural can handle both a dynamic or condenser microphone and an active* piezo pick-up system as found is many acoustic guitars. In this setup example the microphone is used for vocals.

Connections
- Connect the output of your guitars piezo pickup to the Instrument input of G-Natural
- Connect the microphone to the mic input of G-Natural
- Connect L/R outputs to a mixer or to a dedicated acoustic guitar amp

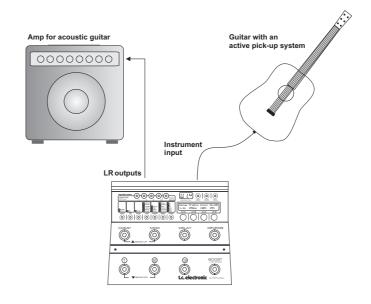* If the pickup system requires the use of a battery the system is active.

WARNING! When connecting the G-Natural outputs to microphone inputs on a mixing console, the phantom power for these channels MUST be switched off! Otherwise you may damage the G-Natural circuits.

Basic settings
- If a condenser microphone is used you must enable the +48V phantom power
- Set input sensitivity via the Levels menu
- Select active effect pressing the COMP, MOD, DELAY and REVERB switches
- G-Natural feature separate EQ and compression settings for mic and instrument inputs

TYPICAL SETUPS

G-Natural with a dedicated acoustic guitar amp

Many guitar players have invested in the increasing amount of dedicated acoustic guitar amps. Either for excellent monitoring with full control or for amplification in small clubs.

Connections
- Connect the output of your guitar's piezo pickup to the instrument input of G-Natural
- Connect the left output to the input of your amp
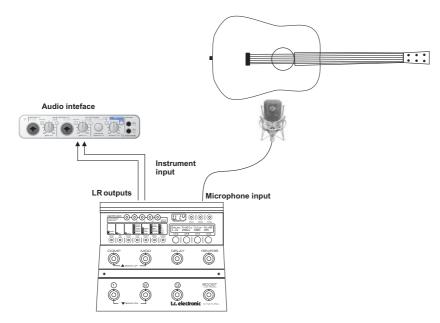- Connect L/R outputs to a mixer if you use the amp for monitoring purposes only.

> **WARNING!** When connecting the G-Natural outputs to microphone inputs on a mixing console, the phantom power for these channels MUST be switched off! Otherwise you may damage the G-Natural circuits.

Basic settings
- Set input sensitivity via the levels menu.
- Select active effect pressing the COMP, MOD, DELAY and REVERB switches
- G-Natural features separate EQ and compression settings for mic and instrument inputs

* If the pickup system requires the use of a battery the system is active.

G-Natural in a studio

In project studios you may enjoy utilizing some of the effects in G-Natural while recording. In this setup we show a setup with a condenser microphone connected to G-Natural and G-Natural's L/R outputs directly to and audio interface.

Connections
- Connect the condenser mic to the G-Naturals mic input
- Activate phantom power
- Connect L/R outputs to your audio interface (or use the digital output)

WARNING! When connecting the G-Natural outputs to microphone inputs on a mixing console, the phantom power for these channels MUST be switched off! Otherwise you may damage the G-Natural circuits.

Basic settings
- Set input sensitivity via the Levels menu
- Select active effect pressing the COMP, MOD, DELAY and REVERB switches
- G-Natural feature separate EQ and compression settings for mic and instrument inputs

MENU - ROUTING

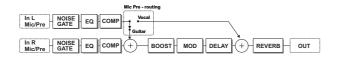**The following manual section covers the parameters accessed via the MENU key.**

Routings

Basics

- Press MENU to access
- Select Routing using encoder D
- Press MENU to confirm
- Set values using encoders A, B and C
- Change pages using encoder D
- Confirm by pressing MENU
- Exit by pressing MENU again

G-Natural has three ways of routing the chain of effects: Serial, Semi parallel and Parallel. Looking at the illustrations below you should notice the separate compression and EQ lines for the instrument and mic-pre input sections.

Serial

The Serial routing connects all effect blocks "in a straight line". This means that each effect block affects the following effect(s).
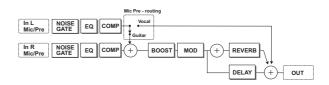

💡 **TIP** If a delay with a long delay time is used in combination with a reverb, you may find the added reverb on the delay repeats disturbing. In that case, use either the Semi Parallel or Parallel routing.

Semi Parallel

The Semi Parallel routing connects most effect blocks serially, but the reverb and delay blocks are now connected in parallel. Consequently, the delay and reverb effects do not affect each other. This means that no reverb is added to the delay repeats.

Parallel

In the Parallel routing, the same signal is fed to the input of the modulation, delay and reverb sections, and therefore these effects will not affect each other.

📝 **NOTE** If the Mic-Pre parameter in the Levels menu is set to "Vocal" and Semi Parallel routing mode is used, then the reverb and delay effects are available on the instrument and line inputs only.

If the Mic_pre parameter in the Levels menu is set to Vocal and Parallel routing mode is used, then reverb, delay and modulation effects are available on the instrument and line inputs only.

Pedal

Basics
- Press MENU to access
- Select Pedal using encoder D
- Press MENU to confirm
- Set values using encoders A, B and C
- Change pages using encoder D
- Confirm selection by pressing MENU if <menu> flashes in the right side of the display
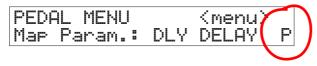- Exit by pressing MENU again

For external control of certain parameters you can connect an expression* pedal.

In this menu you assign which parameters to assign, calibrate G-Natural to the connected expression pedal and also dial in a response curve using the min, mid and max parameters.

Parameters marked with "P"
Some of the parameters in this menu are global parameters and some are saved at preset level. Parameters saved with each preset are marked with "p" in the right side of the display.

Example:

```
PEDAL MENU          <menu>
Map Param.: DLY DELAY   P
```
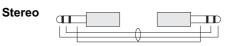
* Best result is achieved using a regular expression pedal with a linear potentiometer. However, you may also achieve satisfying results using a regular volume pedal.

Connecting Expression pedals
Depending on the type of expression pedal used, the pedal should be connected using either a regular mono 1/4" jack-to-jack cable or a stereo 1/4" jack-to-jack cable.

Mono

Stereo

If you are not sure which type to use, you may have to try both types. G-Natural measures the signal on your expression pedals output connector. Therefore only one cable should be used per expression pedal.

Map Parameter
Assigning parameters to the pedal connected to the "Pedal Input"

```
PEDAL MENU          <menu>
Map Param.: DLY DELAY   P
```

- Select a parameter to control from the list
- Press MENU to confirm
- Set Min Mid Max

Min - Mid - Max
Range: 0-100%
These settings determine the parameter response according to an expression pedal connected to the Pedal input. Values can be set for both the minimum, mid and maximum position of the pedal.

MENU - PEDAL

Master

If an expression pedal is connected to the pedal input and a preset is recalled, G-Natural can be set up to respond to either the current position of an expression pedal or to the value stored with the preset.

Preset: The parameter value stored as part of the preset applies – regardless of the current position of the expression pedal.

Pedal: The position of the expression pedal is identified at the moment of preset change, and the value stored as part of the preset is discarded.

Calibrating

In order to secure the best performance of your expression pedal, G-Natural must be calibrated to this pedal. Follow this step by step guide.

- Make sure that you have connected your pedal to the pedal connector on the rear panel
- Select "Calibrate from the Pedal Menu

```
PEDAL MENU
CALIBRATE              <menu>
```

- Press MENU
- The LCD now reads

```
PEDAL CALIBRATE
Set Min:     0         <menu>
```

- Place your pedal in minimum position ("Heel down") and press ENTER

- The LCD now reads

```
PEDAL CALIBRATE
Set Max:     0         <menu>
```

- Place your pedal in maximum position (Toe down) and press MENU

- The LCD reads: "CALIBRATION DONE"

```
PEDAL CALIBRATE
>     CALIBRATION DONE     <
```

Utility

Basics
- Press MENU to access
- Select Utility using encoder D
- Press MENU to confirm
- Set values using encoders A, B and C
- Change pages using encoder D

FX Mute
The FX Mute parameter determines how the Reverb and Delay effects should act when changing between presets and when bypassing one of these effects.

Soft:
Delay and Reverbs will "ring out"

Hard:
Delay and Reverbs will mute.

Tap Master
A preset holds both a subdivision parameter that relates to the global tapped tempo and also a fixed delay time. The tap tempo master parameter defines how the pedal responds to the global tapped tempo at preset change.

Preset:
With Tap Master in Preset mode the delay repeats will play according to the delay time stored with the preset. As soon as you tap, maybe to make a slight correction, the tapped tempo plays according to the set subdivision.

Tap:
With Tap Master in Tap mode the current tapped global tempo and the set sub-division applies instantly at preset change.

Boost Lock
Range: On or Off
When Boost Lock is set to "on" you will be able to boost the amount of dB's specified by the Boost Max. parameter on ALL presets.

EQ Lock
Range: On/off
When EQ is locked the current EQ will be used on ALL presets.

Routing Lock
Range: On/off
If you always use the same routing you may prefer to lock the current routing.

Factory Bank Lock
Range: On/off
G-Natural comes with a selection of factory presets to show the many different sounds and effects you can create with G-Natural. However, as you begin you create you own bank of presets you may prefer not to be able to select factory sounds in a live situation. In that case set Factory Bank Lock to "on". You will then NOT scroll through factory banks when you use the bank up/bank down functions.

Footswitch
Range: Boost or Tap Tempo
Determines the function of the BOOST/TAP TEMPO switch. This switch can be set to act as either boost on/off or as tap tempo.

View Angle
Adjust to get the best display viewing angle.

Clear System
Clear system will set G-Natural back to factory default settings. - Press MENU to execute and confirm.

Clear Bank
With Clear Bank you can clear the entire User preset bank. Press MENU to execute and confirm.

MENU - LEVELS

Levels menu

Basics
- Press LEVELS to access
- Set values using encoders A, B and C
- Change pages using encoder D

Where nothing else is stated the range of the level parameters is -100 dB to 0dB.

Volume
Overall output level control.

Line Level
Output level control for the Line signal

Inst. Level
Output level control for the Instrument signal.

Line Gain & Instrument Gain
These parameters set the input gain for the Line input and the Instrument input. In the example below we set the Line gain. - The procedure is identical for setting the Instrument gain.

- Switch on any pedal in your signal chain that is placed prior to G-Natural and may boost the signal
- Strum your guitar as hard as you do when you play
- Adjust the line gain until the "0" appears:

```
LEVELS MENU >>>>>>>>0
Line Gain : 16
```

- Then back off a few dB's:

```
LEVELS MENU >>>>>>  I
Line Gain : 14
```

- The correct gain is now set.

Left/Right Output
Sets the output level of left and right channels individually.

Boost Max
Range: 0 to 10 dB
This setting determines the max range of the boost function. As 0 dBFS is the max level in the digital domain digital "boost" is done by attenuating the general level and then release this attenuation when boost is required. If you never use the Boost function at all set Boost Max parameter to 0 dB. This will give you the optimal signal to noise ratio.

Input Src (Input Source)
Range: Analog or Digital
The default setting is analog. This setting enables the analog inputs on the rear panel.
If you intend to connect digital equipment to the S/PDIF input, the Input parameter must be set to "Digital".
Note that the output signal is always present on both analog outputs and on S/PDIF out as well.

Mic-Pre
Range: Vocal or Guitar
This parameter determines the routing of the mic input signal.

Guitar: This is the setting to use if the mic input is used for guitar. All processing effects are available.

Vocal: If you are using this input for a Vocal microphone signal you will most likely prefer to route this signal past the Boost, Modulation and Delay blocks.
However the routing of this signal changes in more ways depending on the selected routing mode.

Serial

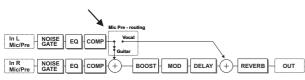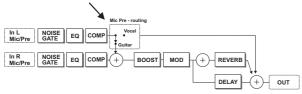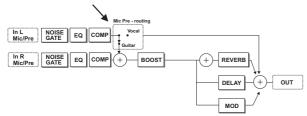In Serial routing with the Mic Pre parameter set to "Vocal", the input signal on the Mic Pre connection is routed past the Boost, Mod and Delay blocks to the Reverb.

Semi Parallel

In Semi Parallel routing with the Mic Pre parameter set to "Vocal", the input signal on the Mic Pre connection is routed past the Boost and Mod blocks to the Reverb and Delay.

Parallel

In Parallel routing with the Mic Pre parameter set to "Vocal" the input signal on the Mic Pre connection is routed past the Boost block to the Reverb, Delay and Modulation.

Volume Position
Range: Pre or Post
This parameter is relevant only if you control the volume using an external Volume/Expression pedal connected to the Pedal input. The position of the volume parameter can be placed "pre" delay/reverb/mod effects or "post" delay/reverb/mod effects.

Pre: The volume control is placed in the boost block before the input of the mod, reverb and delay effects and these effects will therefore fade out (ring) naturally when you set the pedal to minimum position.

Post: The volume control is placed after the mod, reverb and delay effects and these effects will therefore be attenuated immediately when you set the pedal to minimum position.

Digital InGain
Use this parameter to gain the signal present on the digital input. Adjust a low volumes and use a setting a few dB's lower than the where digital clipping occurs. This will ensure best signal to noise ratio.

Dither
Range: Off, 20 bit, 16 bit or 8 bit
G-Natural operates at a bit depth of 24. If you are feeding the G-Natural digital outputs to a digital device with a lower bit-depth, the dither parameter must be set according to the receiving device. As an example a signal sent to a CD recorder should typically be dithered to 16bit.

BOOST FUNCTION

Boost

Wouldn't it be nice if you could just hit a single switch and boost the entire signal for a few important phrases? With the G-Natural boost function it is easy. Via the Levels menu a max boost level is set. Within this limit you may set up a boost level for individual presets.

Essential parameters for the Boost switch:
The BOOST switch may be used either as boost on/off or as tap-tempo. This function is set via the Footswitch parameter found in the Utility menu.

```
UTILITY MENU
Footswitch: Boost
```

Boost Lock:
Range: On or Off
When Boost Lock is set to "on" you will be able to boost the amount of dB's specified by the Boost Max. parameter on ALL presets. The Boost Max. parameter is found in the Levels menu.

Boost Level:
The boost level can be set for each preset within the range of the Max Boost parameter. This range is set in the Levels menu.

Example: - Setting up the Boost Level of a preset
• Ensure that Boost Max in the Levels menu is set to a value different from 0. E.g. 6 dB
• Ensure that Boost Lock in the Utility menu is set to "off".
• Press BOOST.
• Set the boost level for that preset between 0 and 6 dB.

Basics
- To activate the Tuner, press and hold the footswitch in the lower right corner
- Set values using encoders A, B and C
- Change pages using encoder D
- Press any footswitch to exit.

In Tuner mode the following parameters can be set.

Tuner Out
Mute:
Output is muted when in tuner mode.

On:
Output is not muted when in tuner mode.

Tuner Ref
Range: 420 to 460 Hz
This parameter sets the general tuner reference. Default setting is 440 Hz.

Example - tuning a guitar:
- Press and hold the footswitch in the lower right corner until Tuner mode is accessed.

- Play e.g. the A string. Let ring.

If the note is within +/- 100 cent around "A" the tuner will recognize the note A and indicate whether the pitch of the note is too low, too high or in tune.

Too high

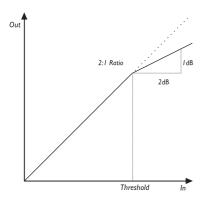**Too low**

In perfect pitch

EFFECTS - COMPRESSOR

Compressor

Introduction
A compressor is used to control the dynamic content of a signal. It can be used both for leveling out the signal's dynamics (thereby letting your guitar sound stand out clearer) and also for more radical, very recognizable effects.

G-Natural offers two types of compression. "Stomp", that offers only a few but effective handles similar to the ones found on stomp-box pedals, and "Studio" which with its extra parameters allows for greater control of the behavior of the compression.

Illustration – Basic Compression

As this illustration shows, the output signal is attenuated relative to the set ratio when the input signal exceeds the threshold point. The attack parameter specifies how fast the attenuation is achieved. Use the gain parameter to compensate the overall loss of level that might result from compression.

G-Natural compressors

G-Natural has separate compressors for the Instrument Inputs and the Mic/Pre input.

Editing compressor parameters:
• Press and hold COMP to select between "Instrument" compression and "Mic/Line" compression. The different compression modes are indicated by "M" for Microphone/Line or "I" for instrument in the right side of the display.
• Press COMP once or more to select either Studio or Stomp type
• Adjust parameters using encoders A-D

Studio Type
This type offers full control over all compression parameters.

Threshold
Range: -40 dB to 0 dB
When the signal exceeds the set threshold point, the compressor is activated. The signal's level above this threshold point is processed according to the settings of the Ratio, Attack and Release parameters (see below).

Ratio
Range: Off, 1.12:1 to Infinite:1
This parameter determines how hard the signal is compressed.

Example: With a Ratio setting of 2:1, an input signal with 4 dB above threshold is reduced to only 2 dB on the output. The "infinite" setting gives you a limiter function.

Attack
Range: 1 ms to 140 ms
The attack time is the response time of the compressor. The shorter the Attack time, the sooner the compressor will reach the specified ratio after the signal rises above the threshold point.

Release
Range: 50 to 2000 ms
The release time is the time it takes for the compressor to release the gain reduction of the signal after the Input signal drops below the threshold point again.

Level
Range: -100 dB to 0 dB
Depending on you compression settings you may prefer to lower the output level of the compression block by a few dBs. Use the compressor Level parameter to do so.

Stomp Type
The two parameters in the Stomp Box compression type controls several parameters each. TC Electronic has carefully tuned the interaction between these parameters. Fast effective results with only two handles.

Drive
Range: 1 to 20
A combination of Threshold and Ratio parameters that sets the compression amount. Make-up gain is applied automatically keeping levels intact.

Response
Range: 1 to 10
A combination of the Threshold and Release parameters. The lower the setting the more you will hear the compression.

> **TIP** When pressing the compressor footswitch both compressors (Mic and Instrument) are switched on/off. To use only one of the compressors in a preset use the following settings for the compressor you do not want to use:
>
> - Level: 0 dB,
> - Threshold: 0 dB
> - Ratio: Off

G-Natural EQs
G-Natural has separate EQs for the Instrument inputs and the Mic/Pre input.

Editing EQ parameters:

- Press and hold EQ to select between "Instrument" EQ and "Mic/Line" EQ. The different EQ modes are indicated by "M" for Microphone/Line or "I" for instrument in the right side of the display.
- Adjust parameters using encoders A-D

For each of the three bands, the following parameters are available:

Gain
Range: -12 dB to +12 dB
Use this parameter to attenuate or boost the frequency range selected with the Freq(uency) parameter.

Freq
Range: 20 Hz to 20 kHz
This parameter sets the center frequency of the frequency range that you want to attenuate or boost.

Width
Range: 0.1 to 4 octaves
This parameter sets the width of the frequency range around the frequency specified by the freq(uency) parameter.

EQ Lock
Range: On/off
Identical EQ for both Instrument and Mic Pre.
With this parameter it is possible to lock the current EQ settings on the instrument line to apply for all presets. This is done by setting the EQ Lock parameter to "on".

EFFECTS - BOOST

EFFECTS - MOD

Boost

The boost level can be set for each preset within the range of the Max Boost parameter. The Max Boost level is set in the levels menu.

Detune

The detune effect is – to some extent – similar to a chorus: The source signal is split and a specified amount of the signal is detuned by an adjustable amount of cents (100 Cent = 1 semitone). The main difference between the detune effect and the chorus effect is that the detune amount does not change: the modulating pitch is specified as an offset to the original pitch.

The detune effect comprises two voices. If you think your sound is simply too direct and clean, try a setting with only a few cent off, on both voices – e.g. +2 cent on voice 1 and -3 cent on voice 2.

Voice 1
Range: -100 to 100
This parameter determines the pitch offset of the first voice in the Detune block.

Voice 2
Range: -100 to 100
This parameter determines the pitch offset of the second Voice in the Detune block.

Delay 1
Range: 0 to 350 ms
This parameter specifies the delay of Voice 1.

Delay 2
Range: 0 to 350 ms
This parameter specifies the delay of Voice 2.

Vibrato

The vibrato effect modulates the pitch of the incoming signal. The result is similar to the vibrato technique used by vocalists. In contrast to a chorus or flanger effect, no direct signal is combined with the pitch-modulated signal.

Speed
Range: 0.050 Hz to 20 Hz
Sets the speed of the effect.

Tempo
Range: Ignore, 2 to 1/32T (T= Triplet & D= Dotted)
When set to any value between 1 and 1/32T, the G-Natural's global tempo is subdivided according to this setting. When se to "Ignore", the speed set by the speed parameter is used instead.

> **NOTE** The Tap Master parameter – located in the Utility menu – specifies whether the Global tempo or the tempo set by the speed parameter in each preset should be used at preset change.

Hi-Cut
Range: 20 Hz to 20 kHz
This parameter reduces the high-end frequencies in the vibrato effect. Try using this parameter if you feel the effect is too dominant.

Tremolo

A tremolo is basically a change of the signal level controlled by an LFO. The G-Natural offers variations of this effect; ranging from soft and smooth to hard and aggressive.

Speed
Range: 0.050 Hz to 20 Hz
This parameter sets the speed of the effect.

Tempo
Range: Ignore, 2 to 1/32T (T= Triplet & D= Dotted)
When set to any value between 1 and 1/32T, the G-Natural's Global Tempo is subdivided according to this setting. When set to "Ignore", the speed set by the Speed parameter is used instead.

> **NOTE** The Tap Master parameter – located in the Utility menu – specifies whether the global tempo or the tempo set by the speed parameter in each preset should be used at preset change.

Type
Range: Soft or Hard (Sinus or Square)
Two waveforms are available as modulation sources for the tremolo effect. Setting this parameter to hard results in a steeper effect. Listen and choose the appropriate option.

Sine

Square

Width
Range: 0 to 100%
If you set this parameter e.g. to 20% with a type setting of hard, the waveform will be on for 80% of one period. With a type setting of soft, a 50% setting would yield a full sine wave, whilst 0% and 100% would yield a crest-to-peak and peak-to crest curve, respectively.

Pulsewidth

Hi-Cut
Range: 20 Hz to 20 kHz
This parameter attenuates the high frequencies of the Tremolo effect. Use the hi-cut filter to create a less dominant tremolo effect without changing the effect's depth.

Chorus

The basic idea of a chorus effect is to split the signal and pitch modulate one of the signals slightly, then mix the two signals again.

Speed
Range: 0.050 Hz to 20 Hz
This parameter sets the speed of the effect.

Tempo
Range: Ignore, 2 to 1/32T (T= Triplet & D= Dotted)
When set to any value between 1 and 1/32T. G-Natural's Global Tempo is subdivided according to this setting. When set to "Ignore", the speed set by the Speed parameter is used instead.

The Tap Master parameter – located in the Utility menu – specifies whether the Global tempo or the tempo set by the Speed parameter in each preset should be used at preset change.

Depth
Range: 0 to 100%
The Depth parameter specifies the intensity of the effect. The value represents the amplitude of the modulating waveform.

Hi-Cut
Range: 20 Hz to 20 kHz
This parameter reduces the high-end frequencies in the chorus effect. Try using this parameter if you feel the chorus effect is too dominant in your sound and turning down the Mix or Out level doesn't give you the dampening of the Chorus effect you are looking for.

Flanger

The Flanger belongs to the same "family" of modulation effects as the Chorus effect. The signal is split, and one of the signals is pitch modulated.
The characteristic "flanging" sound occurs when part of the signal is slightly delayed and fed back to the input of the effect algorithm. Experiment with the Feedback parameter to get familiar with the achievable effects.

Speed
Range: 0.050 Hz to 20 Hz
This parameter sets the speed of the effect.

Tempo
Range: Ignore, 2 to 1/32T (T= Triplet & D= Dotted) When set to any value between 1 and 1/32T, the G-Natural's Global Tempo is subdivided according to this setting. When set to "Ignore", the speed set by the Speed parameter is used instead.

The Tap Master parameter – located in the Utility menu – specifies whether the Global tempo or the tempo set by the Speed parameter in each preset should be used at preset change.

Depth
Range: 0 to 100%
The Depth parameter specifies the intensity of the effect. The value represents the amplitude of the modulating waveform.

FeedB – FeedBack
Range: -100 to 100
This parameter controls the amount of feedback (Resonance) of the short modulated delay that causes the Flanging effect. When the Feedback is set too high (above approximately 90% to 95%), this might introduce *internal* feedback, resulting in a squealing noise that in most cases is unwanted in flanging effects. Beware of this side-effect when experimenting at high volumes. Negative values inverse the phase of the signal that is fed back to the algorithm's Input.

EFFECTS - REVERB

Reverb Types

G-Natural features four different reverb classics. All types have identical editable parameters, but the reverbs' characteristics vary.

Spring

The Spring algorithm is designed to reproduce the sound of old spring reverbs, such as the ones used in vintage guitar amps.

Hall

The Hall algorithm simulates a rather large hall and preserves the natural characteristics of the source material. Excellent when you strive for a discrete Reverb with medium to long Decay times.

Room

The Living Room type simulates a relatively small, well furnished room. In such a room, many reflections are absorbed by soft materials, and the source signal is reflected and sustained mainly from the walls.

Plate

Before the digital era, either reverberating springs or large metallic plates were used to create reverb effects. Plate reverbs sound diffuse and bright. They can be used to make the processed signal "stand out", rather than blend naturally.

These brief introductions should only give you a hint in terms of choosing the right one for a given application. Take some time to listen to the different types, experiment and don't be afraid to be innovative!

Common Reverb Parameters

Decay

Range: 0.1 to 20 seconds
The Decay parameter determines the length of the reverb diffuse field. The length is defined as the time it takes for the diffuse field to decay approximately by 60dB.

PreDly – Pre-Delay

Range: 0 to 100ms
This parameter defines a short delay placed between the direct signal and the reverb diffuse field. Use pre-delay to keep the source material clear and undisturbed from the more diffuse Reverb Diffuse Field arriving shortly after.

Color

The Color parameter can apply dramatic changes to characteristics and style of the reverb – from "dark" and "ambient" to "crisp" and "bright".

Mix

Range: 0 to 100%
This parameter sets the relationship between the dry signal and the level of the effect in this effect block.

Shape

Range: Round, Square or Curved
The shape of the simulated room is of great importance to the reverb characteristics. Try the various shapes.

Size

Range: Small, Medium or Large
Though long decay times can be applied on all reverb types, selecting a predefined (room) size may get you closer to the sound you desire. To achieve a natural sounding emulation of a big room with long decay, select "Large". Use the Medium and Small settings accordingly for simulations of smaller rooms.

Delay Types

Introduction
G-Natural offers the following delay types.

Clean Delay
The Single Delay effect is the most simple and basic delay type in G-Natural. It comprises a single delay line with all the common parameters and it gives a clear reproduction of the source material.

Analog Delay
The Analog Delay rolls off the high-end frequencies, giving you delay repeats with less edge that very often blend better and sound more natural in the mix.

Tape
The Tape Delay simulates historical, tape-based delays, including the clipping sound that occurs when the Feedback parameter is yanked past the 100% point. Try experimenting with a high Feedback level combined with the high-cut filter.

Dynamic
The Dynamic Delay is a feature that was initially introduced in the world renowned TC 2290. It allows the dynamics of the input level to reduce the delay output level while you play and increase the delay level when you stop playing. The result can be a clear and undisturbed source signal while you play and a significant delay level when pausing.

Instead of the Hi-Cut parameter the G-Natural Dynamic Delay has a "Damp" parameter. (see Delay parameters)

PingPong
The PingPong delay causes the delay to alternate between the left and right channels, resulting in a radical stereo feel.

Spill-over

All delays feature true "spill-over" – meaning the repeats of the delay can ring out when you change presets. The tempo of the delay can be defined in relation to a Global tempo, which can be tied to an incoming MIDI clock.

Delay Parameters

The following parameters are identical for all Delay types.

Delay
Range: 0 to 1800ms
This parameter sets the time between the delay repeats. This is also known as the "length" of the delay.

Feedback
Range: 0 to 120%
This parameter sets the amount of feedback from the output of the effect back to its input. Use the Feedback parameter to set how many repeats of the signal you would like to have.

Use high settings with extreme caution. Due to the spillover feature of the G-Natural, there is no way to immediately cut off the delay when you get an internal feedback at settings above 100%. If you do get internal feedback, either switch to a different Delay Type or to a different preset that uses the Delay, two times in succession.

Hi-Cut
Range: 20 Hz to 20 kHz
With digital technology, every delay can be a precise reproduction of the Input signal. But especially with long Delay times, this is not always desirable, as these pristine delays may disturb the original signal and result in a "washed-out" sound. To compensate for this, use the hi-cut filter, thereby emulating analog or style delays.

EFFECTS - DELAY

Mix
Range: 0 to 100%
This parameter sets the mix between the dry signal and
the level of the effect in this effect block.

Damp (Dynamic Delay only)
Range: 0 to 100 dB
The output of the delay repeats is controlled by the input
dynamics. This parameter sets how effective the
attenuation should be.

TECHNICAL SPECIFICATIONS

Digital Inputs and Outputs

Connectors:	RCA Phono (S/PDIF)
Formats:	S/PDIF (24 bit), EIAJ CP-340, IEC 958
Sample Rates:	44.1 kHz, 48 kHz
Frequency Response DIO:	DC to 22/23.9 kHz ± 0.01 dB @ 44.1/48 kHz

Analog Inputs

Connectors, balanced:	Mic.: XLR, Line: ¼"phone jack
Impedance - (Balanced/Unbalanced)	Mic.: 3.6/1.8 kOhm, Line: 21/13 kOhm
Line Input Level @ 0 dBFS:	24 dBu to 0 dBu
Line Sensitivity @ 12 dB headroom:	12 dBu to -12 dBu
Instrument Input Level @ 0 dBFS:	18 dBu to -12 dBu
Instrument Sensitivity @ 12 dB headroom:	6 dBu to -24 dBu
Mic. Input Level @ 0 dBFS: (Pad Off/On)	-13 dBu/7 dBu to -51 dBu/-31 dBu
Mic. Sensitivity @ 12 dB headroom: (Pad Off/On)	-25 dBu/-5 dBu to -63 dBu/-43 dBu
Line, Mic. @ Min gain, Dynamic Range:	> 92 dB, 20 Hz - 20 kHz
EIN @ Max. mic amp. gain, Rg = 200 Ohm:	126 dBu
THD:	< -100 dB (0,001 %) @ 1 kHz
Line Frequency Response:	+0/-0.1 dB, 20 Hz to 20 kHz
Mic. Frequency Response, max gain:	-1.5 dB @ 40 Hz, +0/-0.1 dB (200 Hz to 20 kHz)
Crosstalk:	<-85 dB, 20 Hz to 20 kHz
A to D Conversion:	24 bit, 128 x oversampling bitstream
A to D Delay:	0.65/0.70 ms @ S.R. = 48/44.1 kHz

Analog Outputs

D to A Conversion:	24 bit, 128 x oversampling bitstream
D to A Delay:	0.63/0.68 ms @ S.R.= 48/44.1 kHz
Connectors, balanced:	¼"phone jack
Output Impedance:	40 Ohm
Max. Output Level (Balanced/Unbalanced):	20 dBu/14 dBu, R-load = 1200 Ohm
Output Range:	20 dBu / 14 dBu / 8 dBu / 2 dBu
Dynamic Range:	> 104 dB, 20 Hz to 20 kHz
THD:	<-98 dB (0.0013 %) @ 1 kHz
Frequency Response:	+0/-0.3 dB, 20 Hz to 20 kHz
Crosstalk:	<-100 dB, 20 Hz to 20 kHz

EMC

Complies with:	EN 55103-1 and EN 55103-2
	FCC part 15, Class B, CISPR 22, Class B

Safety

Certified to:	IEC 65, EN 60065, UL6500 and CSA E60065
	CSA FILE #LR108093

Environment

Operating Temperature:	32° F to 122° F (0° C to 50° C)
Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Humidity:	Max. 90 % non-condensing

Control Interface

MIDI:	In/Out/Thru: 5 Pin DIN
Pedal:	1/4" phone jack

Supplementary

Display:	4 character LED, 24x 2 character LCD
Dimensions:	11.1" x 10.25" x 3.5" (282 x 260 x 89 mm)
Weight:	5.9 lb. (2.7 kg)
Mains Voltage:	100 to 240 VAC, 50 to 60 Hz (auto-select)
Power Consumption:	<15 W
Warranty Parts and labor:	1 year

> **Due to continuous development, these specifications are subject to change without notice.**