GEN•VI

ADVANCED DIMMING AND POWER SYSTEM

Rackmount

Wallmount

User Manual
Version V 1.09
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Covering software Version 1.08

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Contents

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1   Product Description

1.1 ABOUT THIS MANUAL

This manual describes the installation, configuration and operation of the GEN VI range of advanced dimmer/power systems manufactured by LSC Control Systems:

- GEN VI Rackmount
- GEN VI Wallmount

1.1.1   Conventions Used in this Manual

There are four different colour themes that you can select on the GEN VI touchscreen. The screen images in this manual use the default "Gothic" colour theme and a 12-channel model.
Throughout this manual, certain conventions have been used to make the meaning clearer.

- A word in **Bold** text represents a button on the touchscreen
- Emphasis is indicated by underlining
- *Notes or Hints are displayed in italic fon*t

1.2 OVERVIEW

The GEN VI dimmers can be controlled by any DMX512 lighting controller. Dimmer configuration, patching and local control is achieved via a backlit colour touchscreen on the front panel. A lock code can be used to prevent unauthorised tampering. Most control functions, configuration options and front panel operations can also be remotely controlled using the RDM (Remote Device Management) protocol.

1.2.1   Features

- DMX512 (1990), DMX512-A (E1-11) and RDM (E1-20) compliant control.
- If DMX is lost, the GEN VI can either hold the last values or fade to a "DMX Loss memory" after a programmable delay.
- RCBO (Residual Current Breaker with Overcurrent) per channel. This is a combined overload circuit breaker with earth leakage (RCD/GFI) protection and neutral disconnect function for each circuit.
- Individual dimmer channel settings for:
  - o   DMX address patching.
  - o   Minimum and maximum output levels.
  - o   Choice of three fade curves (linear, s, or custom) or LSC TruPower (switched) power output.
- LSC TruPower (switched power) provides direct power output by utilising relays guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads. Ideal for discharge lamps and LEDs.
- LSC's proprietary Current Control Technology © (CCT) protects all RCBOs from nuisance tripping due to cold lamp inrush currents.
- GEN VI Rackmount has either 10, 16 or 25 amps per channel models with a choice of rear output connectors.
- GEN VI Wallmount has either 10 or 25 amps per channel models with a choice of front output connectors or internal output terminals.
- Settable constant fan speed or fully automatic.
- 16-bit internal architecture which gives smooth fades. Essential when dimming LEDs.
- 16-bit DMX control selectable for super smooth fades.
- Pulse transformers fired dimmers will dim most types of loads. See section 7.
- 100% duty cycle operation across all channels simultaneously.
- CE and C tick approved.

1.2.2   GEN VI Control Philosophy

Each GEN VI dimmer channel can be *individually configured* to be controlled by either:

1. **DMX Only**. When configured for "DMX Only", a dimmer channel is controlled from a DMX lighting controller. If DMX fails, the channels can either hold their last state or after a programmable delay time, fade to a "DMX Loss Memory" previously stored in the GEN VI.
2. **Auto Power**. When "Auto Power" is enabled, channels configured for "Auto Power" will be *automatically* switched ON at full level whenever any valid DMX signal is detected. These channels will remain on for a programmable "hold time" when DMX is no longer detected. A channels "curve" must be set to "NonDim" before "Auto Power" can be selected. See section 3.8.4

Dimmer channels can also be controlled from the touchscreen by selecting **Rigger's Control**.

1.3 MODELS

The GEN VI rackmount is available in the following models:

*   12 channels at 10 amps per channel.
*   12 channels at 16 amps per channel.
*   6 channels at 25 amps per channel.

The GEN VI wallmount is available in the following models:

*   12 channels at 10 amps per channel.
*   6 channels at 25 amps per channel.

1.4 FACTORY-FITTED OPTIONS

1.4.1   Output Connections

Various output connector options are available. See below for details.

1.4.2   100-120VAC Input Power

GEN VI can be supplied for 100-120VAC input power operation.

1.5 FRONT PANELS

1.5.1   Rackmount GEN VI

The front panel contains the DMX input and through connectors, load RCBOs (Residual Current Breaker (RCD/GFI) with Overcurrent and neutral disconnect), SD card slot (used for software upgrades) and LCD touchscreen.

12-Channel GEN VI Rackmount
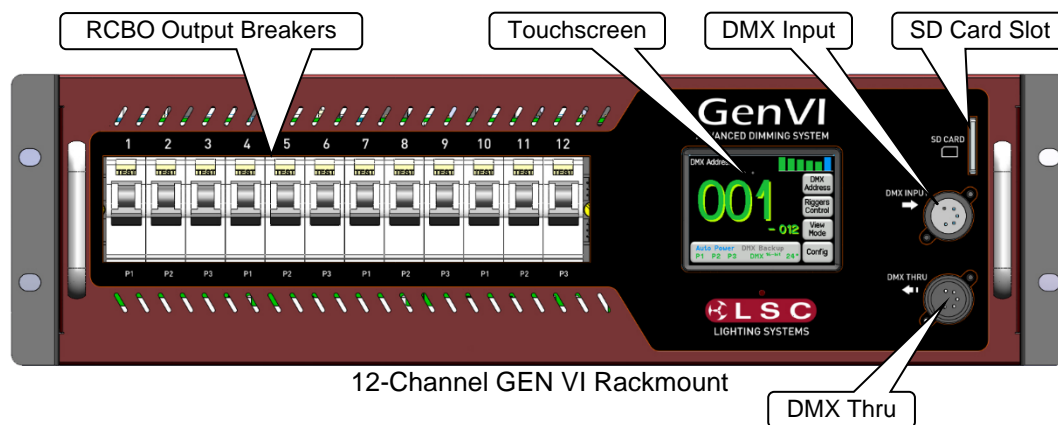
Do not use sharp objects to operate the touchscreen!

1.5.2   Wallmount GEN VI

The front panel contains load RCBOs (Residual Current Breaker (RCD/GFI) with Overcurrent and neutral disconnect), LCD touchscreen and output sockets. The DMX connectors and SD card slot are located on the side of the unit.

12-Channel GEN VI Wallmount with front outlets.

12-Channel GEN VI Wallmount with internal output terminals.

1.6 OUTPUT CONNECTORS

1.6.1   Rackmount GEN VI

12-channel rackmount dimmers can be supplied with the following types of rear-mounted load connections:

10 Amp Australian Sockets

Wieland Sockets

Socapex Sockets

Schuko Sockets

Output Channel
Number Chart

Installation Pluggable Screw Terminals

powerCon Sockets

Output Channel
Number Chart

See section 2.4.4 for the pin-outs of the Wieland and Socapex sockets and the pluggable screw terminals.

6-channel rackmount dimmers are fitted with 6 paired Australian GPO outlets (20A + 15A per channel) on the rear panel.

1.6.2   Wallmount GEN VI

12-channel wallmount dimmers can be supplied with either 1 x Australian GPO connector per channel mounted on the front panel or with output screw terminals located on the rear section of the hinged chassis. Max load = 10 Amps per channel.

6-channel wallmount dimmers can be supplied with either 6 paired Australian GPO outlets (20A + 15A per channel) mounted on the front panel or with output screw terminals located on the rear section of the hinged chassis. Max load = 25 Amps per channel.

Wallmount dimmers with front-mounted outlets can be installed in conjunction with LSC's REDBACK patch system. This allows up to 4 x GEN VI dimmers to be installed on each side of the patch bay allowing for 96 channels of dimming/power distro and the patch bay to be located in an area of only 1.8m high x 1.7m wide.

2   Installation

2.1 SAFETY

All electrical work must be carried out by suitably qualified persons.

2.2 UNPACKING

The GEN VI dimmer is fully tested and inspected before leaving the factory. Upon delivery, inspect the dimmer for signs of damage or mishandling. In the event of any damage, contact your LSC agent.

2.3 MOUNTING

2.3.1 Rackmount GEN VI

The Rackmount GEN VI is designed for mounting in a standard 19-inch rack. It occupies 3RU (Rack Units) of space. Provide adequate support for the dimmer. The dimmer weighs up to 21kgm (depending upon the model). The ventilation holes on the sides of the unit must be kept clear.

2.3.2 Wallmount GEN VI

The dimmer housing is in two parts.
- The rear section which is mounted on the wall
- The front section which is hinged to the rear section.

The rear section has provisions for mounting to walls and other upright structures such as Unistrut. Mounting brackets for Unistrut are available from LSC.
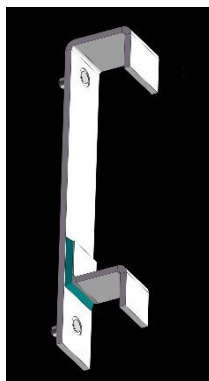
Unistrut mounting bracket LSC Part No: GVW/BRKT

The model with screw terminal for the loads has the terminals located on the rear section of the chassis forming an installation frame which can be attached to the wall and all the supply and load cable terminations completed before the main body and electronics are installed. This method ensures far easier access when terminating cables, as well as ensuring no accidental damage to the rack's electronics by other trades. When all building works are completed, the front section is mounted onto the rear section hinges and connected via internal plugs and sockets.

Allow a minimum of 150mm clearance on either side of the dimmer and 75mm vertical clearance to provide adequate ventilation.

The dimmer weighs 21.5kg.

The chassis is hinged and can be opened for access to the mounting points and wiring connections by removing the four screws as shown and lowering the front panel.

In conjunction with the REDBACK patch system, up to 4 x GVW racks can be installed each side of the patch bay, allowing for 96 channels of dimming/power distro and patch bay to be located in an area of only 1.8m high x 1.7m wide. This combination allows all the user controls to be located within a comfortable working height (between 1.8m and 1m) and ensures that no patch cables touch the floor.
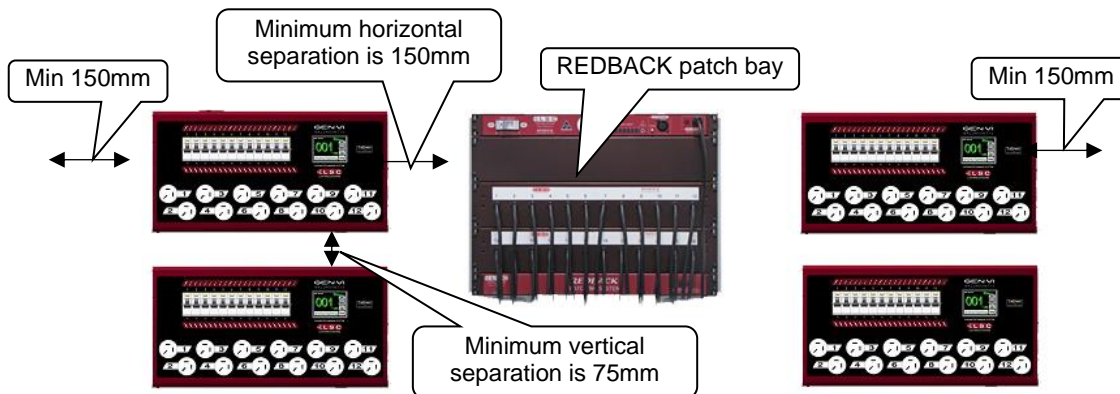
Typical 48-channel installation with REDBACK patch bay

2.4 CONNECTIONS

2.4.1 Input Power Supply

The GEN VI dimmer must be fed from a suitable external circuit breaker.

Note: The rating of the neutral conductor feeding the dimmer must be at least 1.25 times that of rated limit of any of the active phase conductors.
This is because various combinations of dimmer drive will result in a neutral current higher than the line current due to the phase control characteristics of these type of dimmers.
For example, a 40Amp 3 phase supply must have a neutral rated at 50Amps.

The nominal input voltage is 220-240 Volts. 3-phase Star (380-415V). 50-60Hz. 100-120VAC versions are available by special order from the factory.

The GEN VI can be powered from:
- 3-phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 52 Amps per phase. See neutral rating note above.
- single-phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 65 Amps (maximum).

Safety Note: Conversion between 3-phase and single-phase operation should only be undertaken by a suitably trained and qualified electrical technician.

2.4.2   Wallmount GEN VI Power Input

There are a number of possible entry points to connect the incoming 3-phase supply:
- For hardwired installations, there are two large knock-out panels located on the upper left-hand region. These knock-out panels allow wiring to enter and exit the dimmer via cable ducting on top or direct through a wall cavity at the rear.
- For portable or installation situations where a flexible 3-phase tail and plug are required, a 32mm diameter hole exists on the upper left side. A hole plug is supplied to cover this hole when the product is shipped. By removing this plug, a correct size metal or plastic strain-relief gland can be fitted to secure the 3-phase tail to the chassis.

2.4.3   Connecting DMX512

DMX 512 is the industry standard for the transmission of digital control signals between lighting equipment. DMX is usually "looped" from one piece of equipment to the next. DMX 512 is connected to the dimmer via the front panel 5 pin XLR "DMX INPUT" socket.

A "DMX THRU" socket provides a loop output to feed other DMX equipment. If the DMX line ends at this dimmer (is not looped to other dimmers or devices) then the DMX TERM switch must be set to TERM. See section 3.9

LSC recommends the use of RS485 data cable or shielded CAT5 cable for the DMX connections. Audio or microphone cables must not be used.

2.4.4   Output Pin-Outs

2.4.4.1   Socapex Sockets

Connector #1	Function	Connector #2	Function
Pin 1	Chan 1 Active	Pin 1	Chan 7 Active
Pin 2	Chan 1 Neutral	Pin 2	Chan 7 Neutral
Pin 3	Chan 2 Active	Pin 3	Chan 8 Active
Pin 4	Chan 2 Neutral	Pin 4	Chan 8 Neutral
Pin 5	Chan 3 Active	Pin 5	Chan 9 Active
Pin 6	Chan 3 Neutral	Pin 6	Chan 9 Neutral
Pin 7	Chan 4 Active	Pin 7	Chan 10 Active
Pin 8	Chan 4 Neutral	Pin 8	Chan 10 Neutral
Pin 9	Chan 5 Active	Pin 9	Chan 11 Active
Pin 10	Chan 5 Neutral	Pin 10	Chan 11 Neutral
Pin 11	Chan 6 Active	Pin 11	Chan 12 Active
Pin 12	Chan 6 Neutral	Pin 12	Chan 12 Neutral
Pin 13	Earth	Pin 13	Earth
Pin 14	Earth	Pin 14	Earth
Pin 15	Earth	Pin 15	Earth
Pin 16	Earth	Pin 16	Earth
Pin 17	Earth	Pin 17	Earth
Pin 18	Earth	Pin 18	Earth
Pin 19	Earth	Pin 19	Earth

2.4.4.2   Wieland Sockets

Connector 1	Function	Connector 2	Function
Pin 1	Chan 1 Active	Pin 1	Chan 7 Active
Pin 2	Chan 2 Active	Pin 2	Chan 8 Active
Pin 3	Chan 3 Active	Pin 3	Chan 9 Active
Pin 4	Chan 4 Active	Pin 4	Chan 10 Active
Pin 5	Chan 5 Active	Pin 5	Chan 11 Active
Pin 6	Chan 6 Active	Pin 6	Chan 12 Active
Pin 7	Not used	Pin 7	Not used
Pin 8	Not used	Pin 8	Not used
Pin 9	Chan 1 Neutral	Pin 9	Chan 7 Neutral
Pin 10	Chan 2 Neutral	Pin 10	Chan 8 Neutral
Pin 11	Chan 3 Neutral	Pin 11	Chan 9 Neutral
Pin 12	Chan 4 Neutral	Pin 12	Chan 10 Neutral
Pin 13	Chan 5 Neutral	Pin 13	Chan 11 Neutral
Pin 14	Chan 6 Neutral	Pin 14	Chan 12 Neutral
Pin 15	Not used	Pin 15	Not used
Pin 16	Not used	Pin 16	Not used

Note: Earth connection is via the clips on the side of the socket insert.

Note: This is the recommended wiring scheme for Wieland connectors. An alternative wiring scheme exists for these connectors and GEN VI dimmers can be wired to the alternative scheme by special order. If you order the alternative wiring, then the pin-outs are listed in a separate document that is included with your dimmer.

2.4.4.3   Screw Terminals
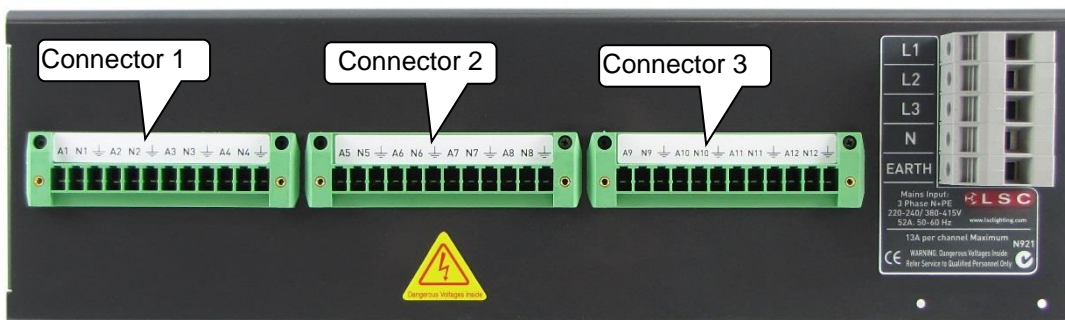
Connector 1	Function	Connector 2	Function	Connector 3	Function
Pin 1	Chan 1 Active	Pin 1	Chan 5 Active	Pin 1	Chan 9 Active
Pin 2	Chan 1 Neutral	Pin 2	Chan 5 Neutral	Pin 2	Chan 9 Neutral
Pin 3	Chan 1 Earth	Pin 3	Chan 5 Earth	Pin 3	Chan 9 Earth
Pin 4	Chan 2 Active	Pin 4	Chan 6 Active	Pin 4	Chan 10 Active
Pin 5	Chan 2 Neutral	Pin 5	Chan 6 Neutral	Pin 5	Chan 10 Neutral
Pin 6	Chan 2 Earth	Pin 6	Chan 6 Earth	Pin 6	Chan 10 Earth
Pin 7	Chan 3 Active	Pin 7	Chan 7 Active	Pin 7	Chan 11 Active
Pin 8	Chan 3 Neutral	Pin 8	Chan 7 Neutral	Pin 8	Chan 11 Neutral
Pin 9	Chan 3 Earth	Pin 9	Chan 7 Earth	Pin 9	Chan 11 Earth
Pin 10	Chan 4 Active	Pin 10	Chan 8 Active	Pin 10	Chan 12 Active
Pin 11	Chan 4 Neutral	Pin 11	Chan 8 Neutral	Pin 11	Chan 12 Neutral
Pin 12	Chan 4 Earth	Pin 12	Chan 8 Earth	Pin 12	Chan 12 Earth

3   Menu System

3.1 OVERVIEW

The GEN VI dimmer uses a touchscreen with menus on the screen that provide the functions to configure and operate the dimmer.

3.2 HELP SCREENS

Several menus have Help screens available. Press the button [?] (when available) to see the help screen. Press anywhere within the help screen to cancel.
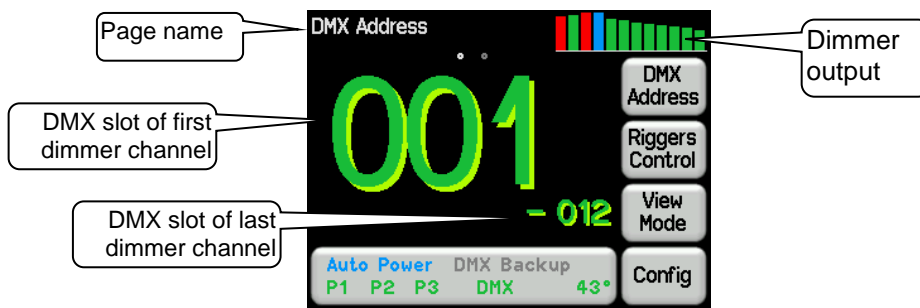
3.3 HOME PAGES

There are two "home" pages that can be selected. Pressing **View Mode** changes the display between the "DMX Address" home page and the "Dimmer Output" home page. Both home pages provide access to the "Rigger's Control" and "Config" menus.
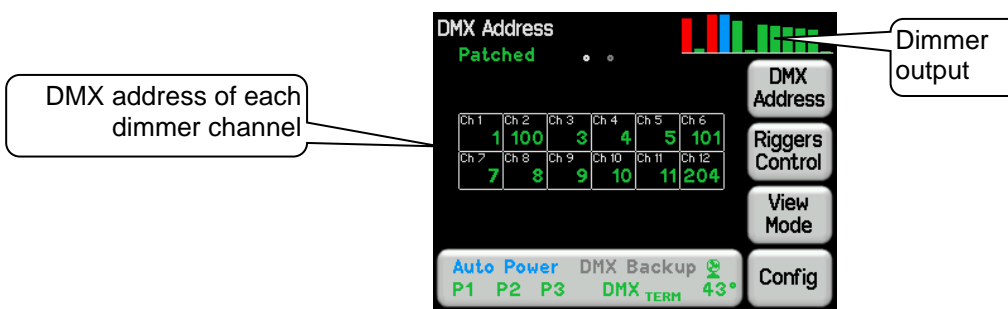
3.3.1   DMX Address Home Page

The "DMX Address" home page has two formats:
- If a 1 to 1 patch is implemented (via the "DMX Address" button) it shows the DMX addresses of the first and last channels of the dimmer (in a large and small font respectively)

"DMX Address" Home Page with 1 to 1 Patch

- If channels are individually patched it shows the word "Patched" and the DMX addresses of all channels in the dimmer

"DMX Address" Home Page with channels individually patched

Individual channel patching is performed in the DMX menu. See section 3.7

Both displays also show a colour coded mini bar-graph of the dimmer output at the top of the screen. See the "Dimmer Output" home page below for the colour code of the bar graph.
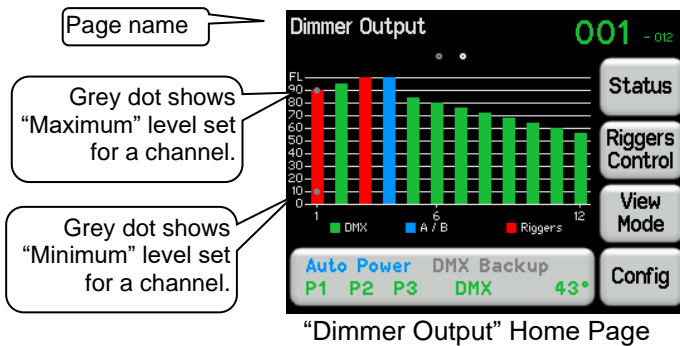
3.3.1.1   DMX Address

Patches are often performed in contiguous blocks of addresses. The "DMX Address" button provides a rapid method of patching all of the dimmers in one GEN VI rack to sequential DMX slots, starting from a DMX address that you enter. This is commonly known as a 1 to 1 patch.

To perform a 1 to 1 patch, select the "DMX Address" home page (above) then press **DMX Address**.
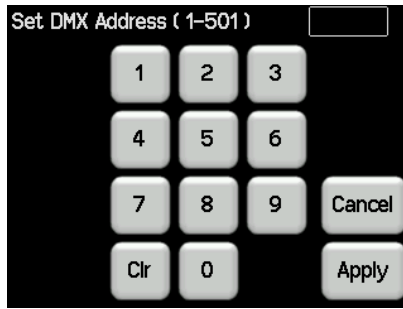
Enter the DMX address for the first channel in this GEN VI then press **Apply**.

3.3.2   Dimmer Output Home Page

Page name

Grey dot shows "Maximum" level set for a channel.

Grey dot shows "Minimum" level set for a channel.

"Dimmer Output" Home Page

The "Dimmer Output" home page has a large display of output levels of the dimmer channels that also shows the <u>control source</u> of each channel according to the colour code.

- Green = DMX control
- Blue = Auto Power or Backup (DMX loss) memory
- Red = Rigger control (via the touchscreen)

Channels are controlled on a HTP (Highest Takes Precedence) basis. If multiple sources are controlling a channel (such as DMX and rigger's control) then the highest level will be output and will hence determine the colour of the bar graph.

If a minimum or maximum level has been set for a channel they are indicated by grey dots on the channels bar graph. The output is scaled between the minimum and maximum levels.

The top right corner of the screen shows the DMX address information.

- If a 1 to 1 patch is implemented it shows the DMX addresses of the first and last channels of the dimmer rack
- If channels are individually patched it shows the word "Patched"

The "Dimmer Output" home page also and provides access to the **Status** menu.

3.3.2.1   Status

On the "Dimmer Output" home page, pressing **Status** shows the following information…
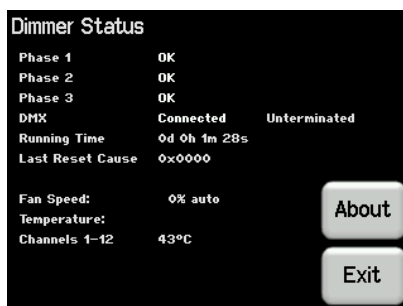
It shows the presence of the input power phases, DMX presence, the current setting of the DMX termination, dimmer running time, last cause of a reset, internal temperature and the fan speed and fan setting (constant speed or automatic).

Pressing **About** shows the software versions, RDM ID and the optional "Owner" name. See section 6 for more information about RDM. Pressing **Owner** allows you to enter a permanent name for the dimmer ("This unit belongs to:") as a deterrent against theft. If you enter an owner name then this text is permanently locked and can only be changed by an authorised LSC dealer.
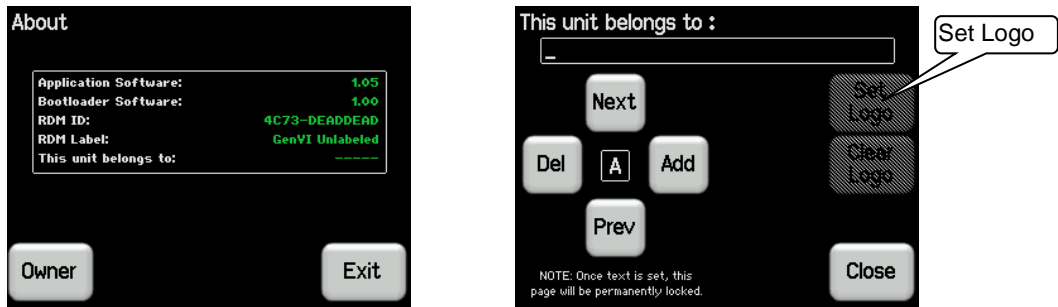

The "Owner" menu also allows you to set a "Logo" that will be momentarily displayed when power is applied to the GEN VI instead of the LSC logo. To set a custom logo a special file must be present on an SD card inserted in the GEN VI. There is a fee for LSC to convert your logo into the special file that will load into your GEN VI. Please contact LSC or your LSC agent for details.

3.4 DIMMER STATUS

The large button at the bottom of both home pages shows the status of the following…

- **Auto Power** shows the status of the "Auto power" function that switches on selected channels when DMX is present. See section 3.8.4
  Blue is active. Grey is not active.

- **DMX Backup** is the "DMX loss" memory. See section 3.8.3
  Blue is active. Grey is not active.

- **P1**, **P2**, **P3** show the presence of the input power phases.
  Green indicates power is present. Flashing red is not present.

- **DMX** shows the presence of a DMX control signal.
  Green is DMX present. Flashing Red is not present.

- **16-bit** indicates that DMX control is using 16-bit resolution. See section 3.8.2

- **TERM** indicates that the DMX line is terminated by the GEN VI dimmer. See section 3.9

- The GEN VI has an internal cooling fan. The animated fan symbol is displayed when the fan is running. The fan speed can be controlled. See section 3.12.3. The letter "C" is displayed beside the fan symbol if the speed has been set to "Constant".

- The internal temperature of the GEN VI is shown in degrees Celsius. The colour warns you if the temperature is too high.
  o At normal temperatures the display is green.
  o At 65C the display turns yellow.
  o At 75C the display turns red.
  o At 85C it flashes red.
 o At 90C the ALL OUTPUT is automatically switched OFF.
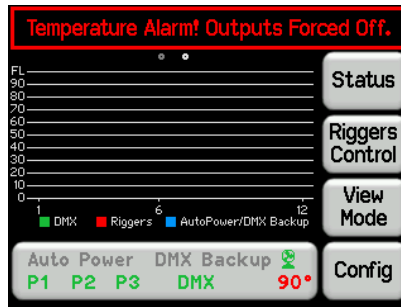
Either reduce the load or increase the cooling to reduce the temperature. If the fan has been set to a constant slow speed either increase the speed or set it to "Automatic". See section 3.12.3.

When the temperature drops below 86 degrees the outputs are <u>automatically switched back on</u>.
If the fan is set to "Constant Speed", the fan will automatically run at full speed if the temperature exceeds 65 degrees.
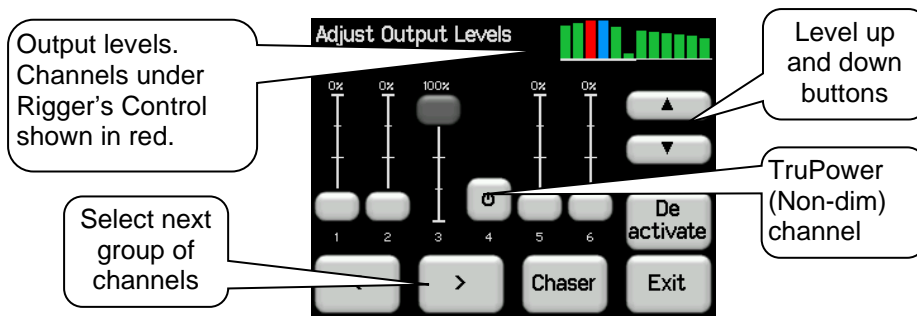
Touching [Auto Power DMX Backup P1 P2 P3 DMX TERM 43°] shows the legend for the display…
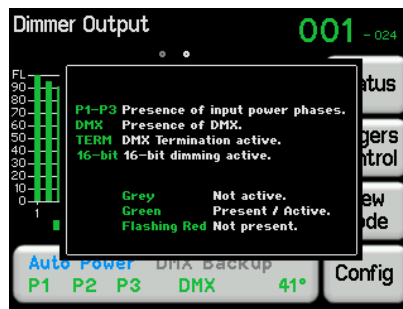
Touch anywhere within the legend window to close.

3.5 RIGGER'S CONTROL

To set the level of a channel(s) (or run a chaser) from the touchscreen, from either home page (above) press **Rigger's Control**.

The output of the rigger's controls can be turned off or on by pressing:
De activate/**Activate**. Channels are controlled on a HTP (highest Takes Precedence) basis. If multiple sources are controlling a channel (such as DMX and rigger's control) then the highest level will be output.

To set the level of a channel(s), use the <u>virtual faders</u> or touch a fader then use the ▲ or ▼ buttons. "TruPower" channels have an On/Off push button switch instead of a fader. The button turns green when it is on.
Press **<** or **>** to select more channels. When finished press **Exit**.

3.5.1   Chaser

To activate the chaser, from the "Rigger's Control" (above), press **Chaser**.
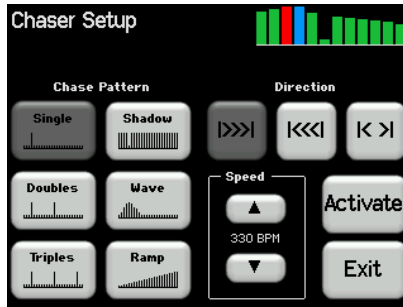
To enable the Chaser press **Activate**.
Select a pattern using the 6 "Chase Pattern" buttons.
Set the speed in BPM (Beats Per Minute) by pressing the ▲ or ▼ buttons.
Use the "Direction" buttons to select **I≫I** (forward), **I≪I** (reverse) or **I<>I** (bounce from end to end).
To disable the Chaser press **De-Activate**.
When finished press **Exit**.

3.6 CONFIG MENU
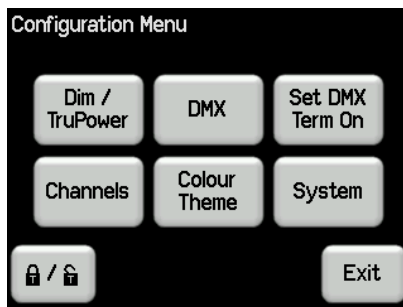
From either home page, pressing **Config** allows you to access a range of functions and setups via sub-menus.

If the GEN VI has been "locked", the **Config** button is replaced by the **Padlock** button.

Touching the **Padlock** button and entering your code number unlocks the GEN VI and reveals the **Config** button. See section 3.12 for details on how to lock and unlock the GEN VI.

The following table shows the functions that can be performed in each sub menu.

| Dim/TruPower	DMX	Set DMX Term
Fast Configuration of either Dimming or TruPower (switched) for each channel.	Patch View DMX Input levels Edit DMX Loss Memory & Delay Time Fade In/Out DMX Loss memory Enable Auto Power Auto Power Hold Time	On/Off
Channels	**Colour Theme**	**System**
Min Level Max Level Curve Source	Antarctic Dawn Redback Gothic	Code Upgrade Reset Fan Control Import/Export
Lock		
User Owner Service		

3.7 DIM/TRUPOWER

Each channel can be individually configured to be either a dimmed channel or a switched channel. Switched channels use LSC's "TruPower" technology that provides direct power by utilising relays, guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads. "TruPower" is used for devices that do not fade but need to be switched OFF or ON such as motors, discharge lamps and some LED fixtures. When the control signal exceeds 60% the channel will switch from OFF to full ON. When the control signal drops below 40%, the channel will switch OFF.

Selecting **Config**, **Dim/TruPower** provides a rapid means of for configuring channels as either "Dimming" or "TruPower".
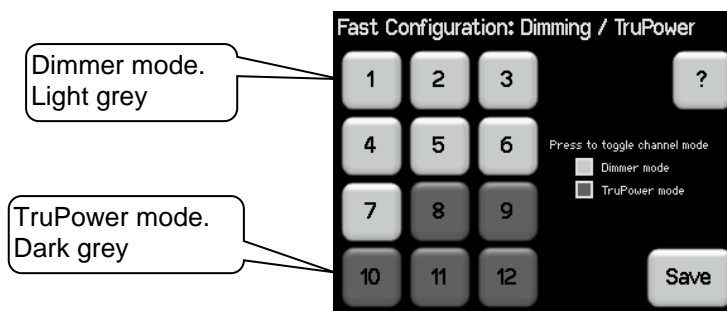
Press a channel to toggle its mode. A light grey button indicates dimmer mode and a dark grey button indicates TruPower mode. Configure your channels then press **Save**. Changing a channel from TruPower to Dimming can potentially damage connected equipment. If you change a channel from TruPower to Dimming the L curve will be applied and you will be asked to **Confirm** your changes.
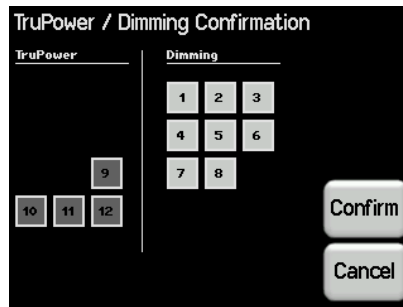
If you change a channel from Dimming to TruPower, no confirmation is required and the changes will be applied when you press **Save**.

Note that channels can also be changed between Dimming and TruPower in the "Channels" menu with more options available. See section 3.10.3.

3.8 DMX MENU

Selecting **Config**, **DMX** provides menus for:
- Patching DMX.
- Editing and activating the <u>DMX Loss</u> (D) memory.
- Enabling and time setting the <u>Auto Power</u> function.
- Viewing the Input DMX signal.
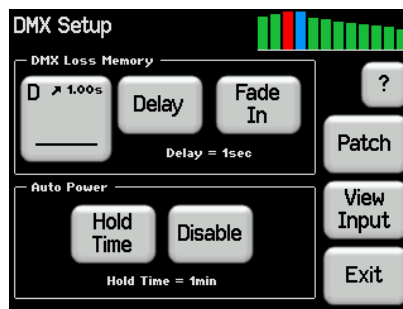

3.8.1   Patch

Each GEN VI dimmer unit numbers its channels from channel 1 through to channel 12.
The patch menu allows you to patch (connect) DMX slots (addresses) from your DMX lighting controller to GEN VI channel numbers. Patches are often performed in contiguous blocks of addresses.

*Note: The **DMX Address** button on the "DMX Address" home page provides a rapid method of patching <u>all of the dimmers</u> in one GEN VI unit to <u>sequential DMX slots</u>, starting from a DMX address that you select. See section 3.3.1.1*

The "Patch" menu allows you to individually patch dimmers channels to DMX slots. Individual patches are required when;
- A particular *DMX slot number* from the lighting controller is to control a particular GEN VI dimmer *channel number*.
- A single DMX slot number is to control multiple GEN VI channel numbers.

To individually patch dimmers channels to DMX addresses press **Config**, **DMX**, **Patch**.


Page 19
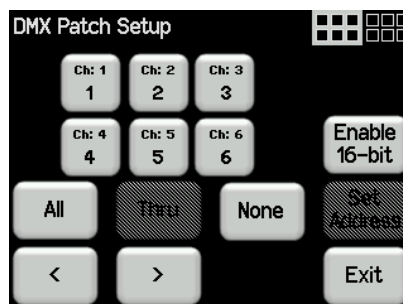
The menu shows the first 6 channels. Use the **<** or **>** buttons to see the other groups of 6 channels. Touch a channel to select it. You can select multiple channels. To select a range of channels select your first channel then press **Thru** then your last channel. Use **All** to select all channels. Press **None** to de-select all channels. When you have selected your channel(s) press **Set Address**.
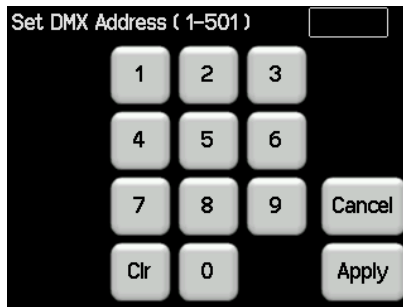
Enter the required DMX address then press **Apply**.

If more than one channel is selected, then the lowest channel number will be patched to the selected DMX slot and the following dimmers will be patched to the sequential DMX slot numbers.

For example, if channels 1, 2, 3 and 10 are selected and DMX slot number 24 is applied the result will be:

Channel	DMX Slot
1	24
2	25
3	26
10	27

To patch multiple channels to the same DMX slot <u>patch them one at a time</u>.

When finished patching press **Exit**.

If dimmer channels have been individually patched, then the "DMX Address" home page displays a table showing the patches. For example:
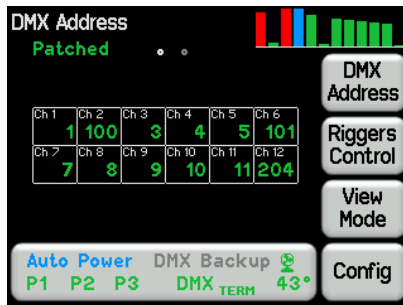
3.8.2 16-Bit DMX Control

The DMX512-A signal contains the level information for 512 DMX slots (addresses). The level for each slot is sent in 8 bits of data which gives a maximum resolution of 256 discrete levels between off and full on. If you require smoother fades, the GEN VI dimmer can be set to 16bit mode where each dimmer channel uses 2 DMX slots to control its level. This gives 65536 discrete levels when fading from off to full. Your lighting controller must also support 16-bit dimmers.

To use 16-bit control, from the "DMX Patch Setup" menu (above) press **Enable 16-Bit**. The status area at the bottom of both home pages shows you when 16-bit DMX control is selected.

12 dimmers use 24 DMX slots in 16-bit mode

16-bit DMX control is selected
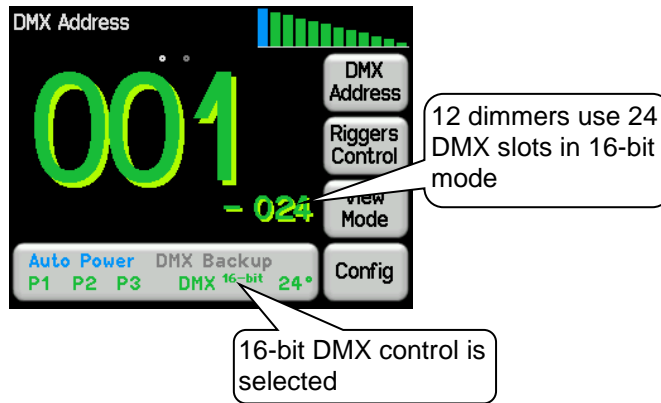
See section 5 for more information on DMX.

3.8.3 DMX Loss Memory

The GEN VI has a "DMX Loss Memory" that you can program. In the event that the DMX input signal is lost, channels set to DMX control will hold their last DMX level for a programmable "Delay" time. The default setting for this time is "Infinite". If you set a delay time other than "Infinite", the channels will fade to the "DMX Loss Memory" when the delay time expires (up to 1 hour). When DMX is restored, the GEN VI will fade back (in 1 second) to the DMX signal.

To create or edit a "DMX Loss Memory" press **Config**, **DMX**.
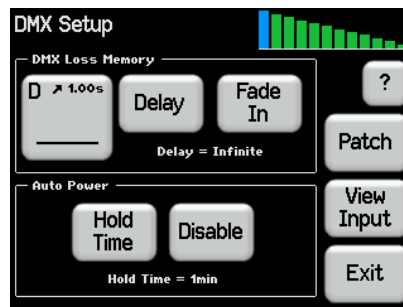
The "DMX Loss Memory" pane has 3 buttons:

- Press [D ↗ 1.00s] to create or edit the memory as described below.
- Press **Delay** to set the time that the GEN VI will wait after DMX is lost, until its output fades to the "DMX Loss Memory".
- Press **Fade In/Fade Out** to see the DMX Loss memory on the output.

The [D ↗ 1.00s] button shows a bar graph display of the current DMX Loss memory (if any) and also its fade time in seconds. For example,

Bar graph of DMX Loss Memory channel levels
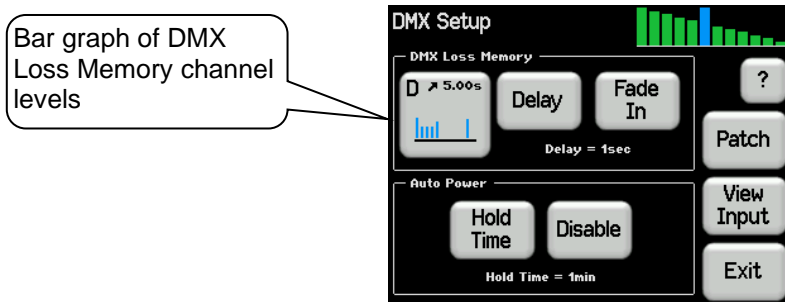
When you press [D ↗ 1.00s], the "DMX Loss Memory" menu allows you to create or edit the "DMX Loss Memory" by any of the following methods:

- Manually set channel levels using the controls on the screen.
- Take a **Snap** (snapshot) of the current DMX input signal.
- Take a **Snap** (snapshot) of the current state of the output.

Navigator shows current group of 6 selected channels highlighted

Selects next group of 6 channels

You can also set a fade time for the DMX Loss Memory.

3.8.3.1   Manually Setting Channel Levels

The "DMX Loss Memory" menu (above) shows the first 6 channels. Use the **<** or **>** buttons to see the other groups of 6 channels. The navigator at the top right of the screen shows current group of 6 selected channels highlighted.

Touch a channel to select it. You can select multiple channels. To select a range of channels select your first channel then press **Thru** then your last channel. Use **All** to select all channels. Press **None** to de-select all channels. When you have selected your channel(s) press **Level**.
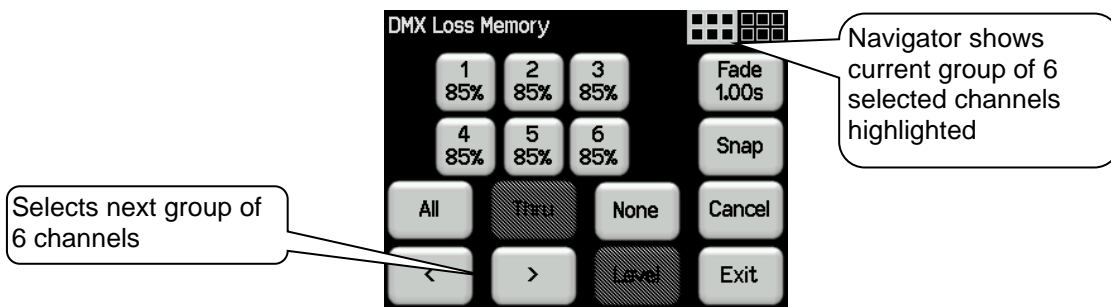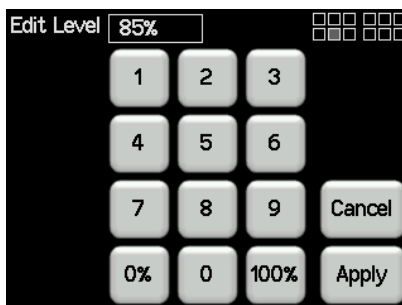

Use the keypad to set the level then press **Apply**.

3.8.3.2   Taking a Snapshot

To create a memory by taking a snapshot, press **Snap** from the "DMX Loss Memory" menu above.
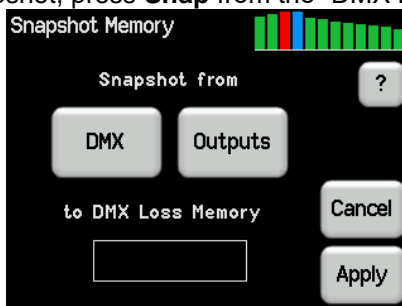
- Pressing **DMX** will take a snapshot of the current DMX input signal.
- Pressing **Outputs** will take a snapshot of the current output of the GEN VI. These channel levels could be coming from DMX or rigger's control or a combination of both.

When you take the snap, the channels levels will be displayed in the box.

Channel levels in the snapshot
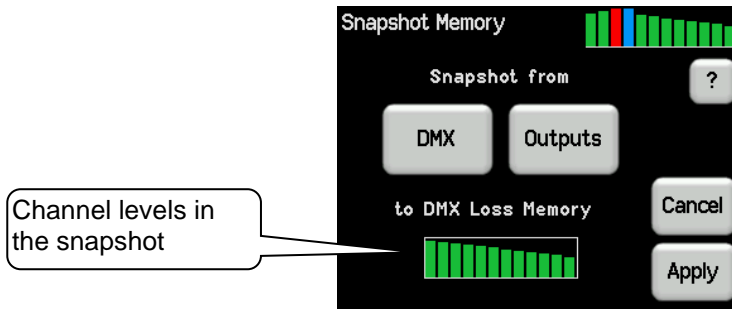
To save the snapshot to the memory press **Apply**.
The channels levels that were captured in the snapshot can be edited by manually setting channel levels as described above.

3.8.3.3 Fade Time

When editing the DMX Loss memory (above), you can set a fade (in/out) time for the memory by pressing **Fade**.
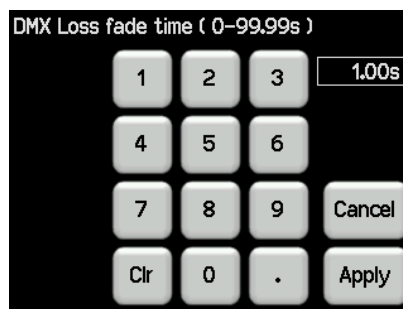
Enter a time in seconds (0 to 99.99) then press **Apply**.

3.8.3.4 Fade In/Out

The DMX Loss memory is normally activated automatically when DMX is lost but you can also manually fade the memory in or out using the **Fade In** / **Fade Out** button.

Fade In/ Fade Out
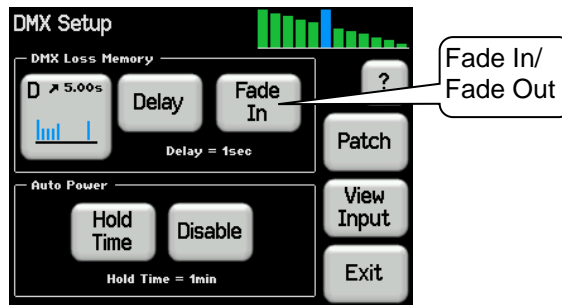
3.8.4 Auto Power

Many lighting fixtures such as LED's and moving fixtures require a constant source of non-dimmed power when they are operating. Normally you would manually switch on the power to these devices prior to a show and manually switch them off at the conclusion. Auto Power is a feature that automatically switches selected GEN VI channels to full ON whenever there is a DMX signal present on the input to the GEN VI and switches them OFF when the lighting controller is turned off and the DMX signal is not present. A "Hold Time" can be set to prevent fixtures being turned off if there is a short interruption to the DMX signal and also to allow for a cool down period for the fixtures.

In the following example, the 3 moving fixtures require non-dimmed power plus DMX for control. They are connected to a GEN VI channel that is configured for "TruPower" and "Auto Power". The 2 conventional fixtures are connected to GEN VI channels configured for either "S Curve" or "L Curve" dimming outputs. When the lighting controller is switched on, the GEN VI detects the DMX signal and automatically switches on the power to the moving fixtures.
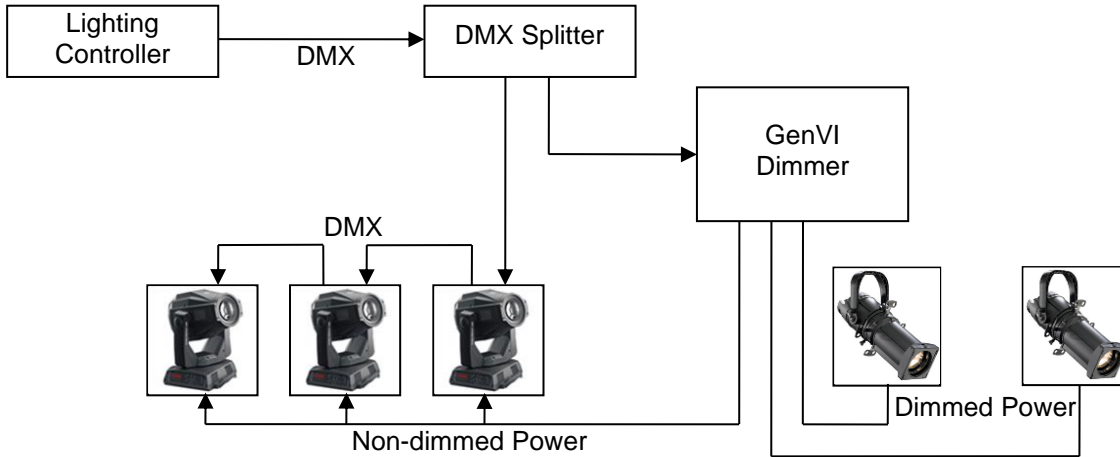
Note: To make a channel switch On when DMX is present you must "Enable" Auto Power as described below and also select "TruPower" as the channel's "Curve" and "Auto Power" as the channel's "Control Source". See section 3.7 for details.

To enable "Auto Power" select the DMX Setup menu by pressing **Config, DMX**.
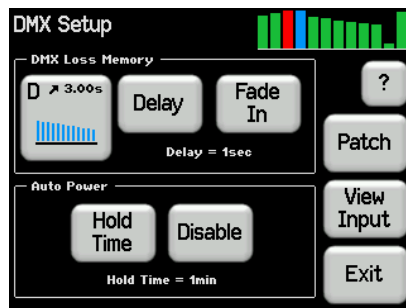
The "Auto Power" pane has 2 buttons:

- Press **Disable** to disable the Auto Power function. The button then changes to **Enable**. This is a global setting for all channels that have their control source set to "Auto Power"
- Press **Hold Time** and enter a time from 1 to 60 minutes. This is the time that the "Auto Power" channels will stay ON when the DMX signal is lost.
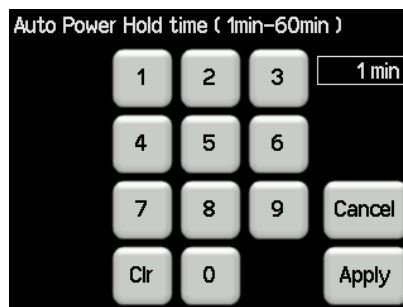
3.8.5   View Input

The "DMX Setup" menu allows you to view the channel levels on the DMX input. Press **View Input**.
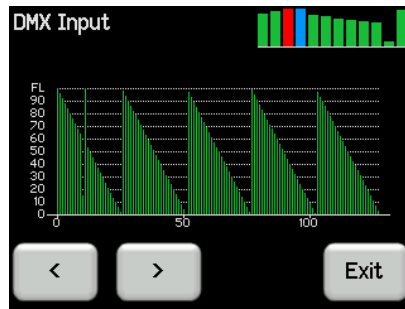
Press either **>** or **>** to scroll through all slots in the DMX Universe.

3.9 SET DMX TERM

Selecting **Config**, **Set DMX Term On/Off** switches the internal DMX termination switch On or Off respectively. See section 5 for more details on DMX.

3.10 CHANNELS MENU

Selecting **Config**, **Channels** provides menus for configuring the following parameters for each channel:
- Min. Minimum Level
- Max. Maximum Level
- Curve. The choices are: S curve diming, L (Linear) dimming, TruPower or Custom curve dimming.
- Source. The control source for the channel. The choices are: "DMX only" and "Auto Power" (On at full whenever DMX is present).
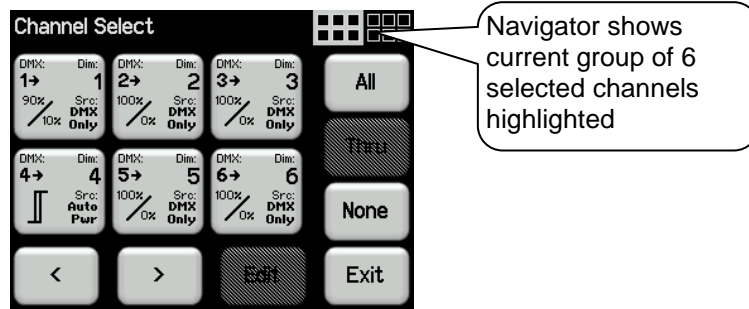
The screen shows the settings for the first 6 channels. Use the **<** or **>** buttons to see the other groups of 6 channels. The navigator in the top right of the screen shows the selected group highlighted.

Each channel button shows the settings for that channel. For example:

DMX: Dim:
2→   **2**
100%   Src:
∫ 0%   **DMX Only**

Curve = S

DMX: Dim:
55→   **3**
100%   Src:
/ 0%   **DMX Only**

Curve = Linear

Dimmer Channel 3 patched to DMX 55

DMX: Dim:
88→   **1**
100%   Src:
C   **DMX Only**
0%

Curve = Custom
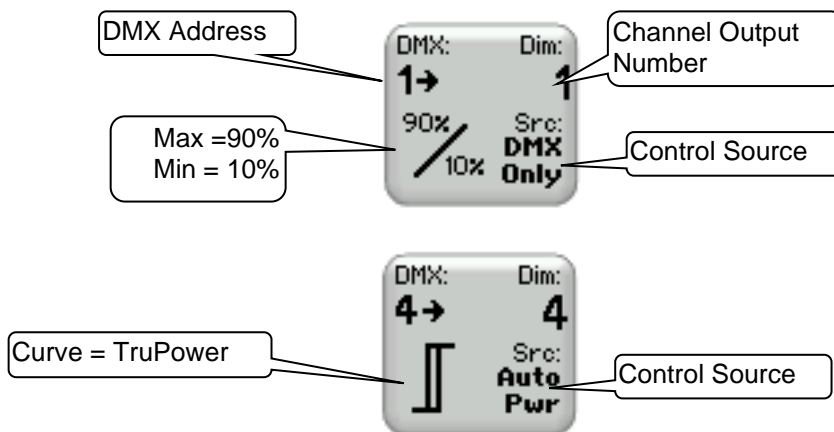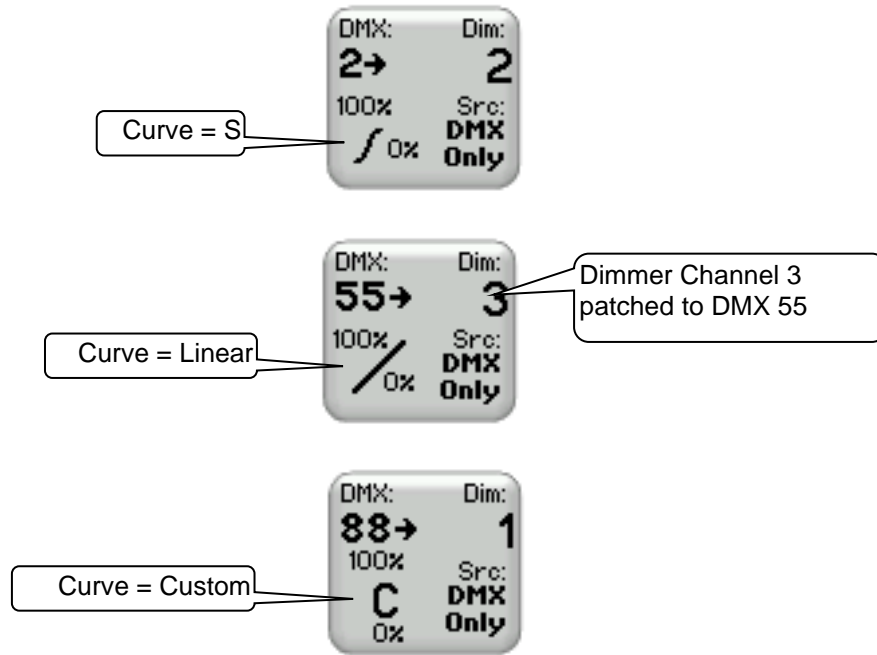
To change the settings of a channel(s), select the channel(s) by touching it. You can select multiple channels. To select a range of channels select your first channel then press **Thru** then your last channel. Use the **<** or **>** buttons to see the other groups of 6 channels. Use **All** to select all channels. Press **None** to de-select all channels.

The selected channels are highlighted in the navigator:

Selected Channels

Selected Channel

Channel Select

DMX: Dim:
1→   **1**
90% /   Src: DMX

DMX: Dim:
2→   **2**
100%   Src: DMX

DMX: Dim:
55→   **3**
100% /   Src: DMX

All
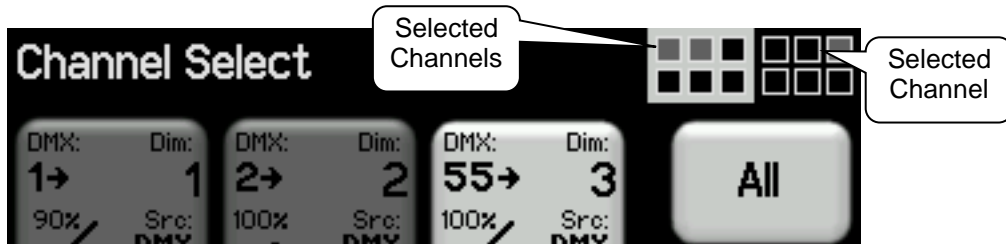
In this example channels 1, 2 and 9 are selected.

When you have selected your channel(s) press **Edit**.

There are 4 possible parameter menus: Min Level, Max level, Curve and Source. Use the ▲ and ▼ "Parameter Selector" buttons to scroll through the parameter settings for the selected channel(s).

Parameter Selector

Parameter Selector

Help

Min (0-100%)
▲   1 2 3   ?
Max 90%
Min 10%   4 5 6
Source DMX
▼   7 8 9 Cancel
0% 0 100% Apply

Min Level

Max (0-100%)
▲   1 2 3   ?
Curve
Max 90%   4 5 6
Min 10%
▼   7 8 9 Cancel
0% 0 100% Apply

Max level

Selected Parameter

Curve
▲   / S-Curve   ?
Source DMX
Curve /   / L-Curve
Max 100%
▼   ∬ TruPower   Cancel
Custom Curve   Apply

Curve

Source
▲   DMX Only   ?
Min 10%
Source DMX   Auto Power
Curve
▼   Cancel
            Apply
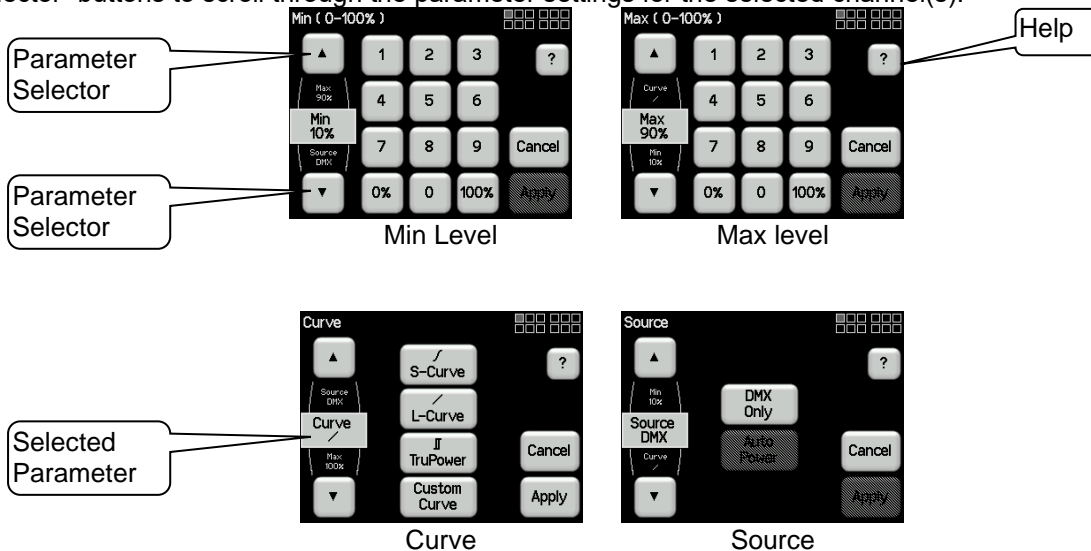
Source

- A channel must be set to the "TruPower" curve before "Auto Power" can be selected as the "Source".

- If a channel is set to "TruPower" then the Min and Max settings are not available and any Min or Max settings that may have been made are ignored.

Each parameter setting is described below and on screen help [?] also explains each parameter.

3.10.1 Min Level

"Min" sets the level of the channel output when the control signal is set to minimum. For example, setting this value slightly above zero is useful to "Pre-Heat" lamp filaments.
"Min level" is disabled in "TruPower" mode.

3.10.2 Max Level

"Max" sets the level of the dimmer output when its control signal is set to maximum. For example, setting this value to 90% will extend the life of a lamp as it never operates on full voltage or setting it to 50% provides 115 volt output.
Note: The actual output voltage is dependent upon the dimmer curve. LSC recommends that you measure the output voltage (with a 240 volt load connected) to determine the "Max" level setting you require for a specific maximum voltage. This procedure should only be carried out by suitably qualified personnel.
"Max level" is disabled in "TruPower" mode.

3.10.3 Curve

Fade Curve is the curve or "transfer characteristic" between input control signal and dimmer output. The following curves are available;

- **S curve**. Provides a normal response between control signal input and dimmer output.

- **Linear curve**. Provides a linear response with more output at the lower end.

- **TruPower**. GEN VI "TruPower" output provides switched power by utilising relays, guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads. When the control signal exceeds 60% the channel will switch from OFF to full ON. When the control signal drops below 40%, the channel will switch OFF. "TruPower" is used for devices that do not fade, but need to be switched OFF or ON such as motors, discharge lamps and LED fixtures. Min and Max level are not available when TruPower is selected. Channels can also be quickly configured as "Dimming" or "TruPower" in the "Dim/TruPower" menu. See section 3.7.

- **Custom curve**. The custom curve is provided for special dimming cases. One LSC custom curve is included with the GEN VI dimmer. It is suitable for dimming LEDs. You can export the LSC custom curve and modify it to your own requirements. To do so, insert a SD card into the slot then select: **Config**, **System**, **Import/Export**, **Export Curve**. Transfer the "CURVE.DAT" file from the SD card to a computer. The file is a text file that you can open in any text editor or spreadsheet program. It has one entry per line indicating output level (0-65535) for each of 256 DMX input values (0-255).
If you want to visualise and/or manipulate the data, select the whole file in your text editor, copy the contents and paste it into a column in a spreadsheet program then create a graph from that data series.

Here is what the LSC custom curve looks like when opened in a spreadsheet with a line chart inserted:
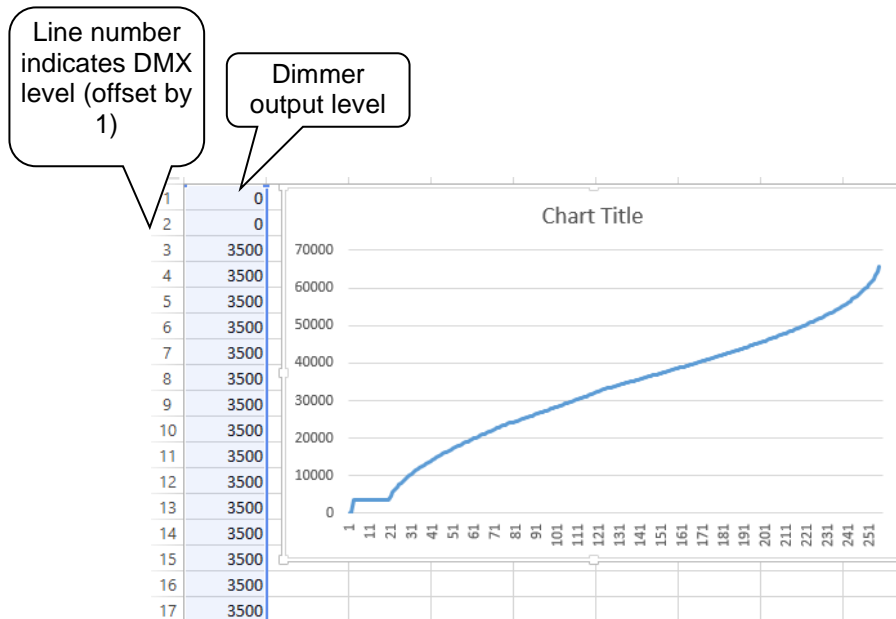
For example, if DMX input level is 2 then you look at line 3 (because DMX values start at 0) and you get the output level of the dimmer of 3500. You can change the shape of the curve by changing the dimmer output levels for each associated DMX input level.

Using a spreadsheet with a chart displayed makes it easy to see the new curve because the chart changes in real time as you change the output levels.

When you have made your changes in the spreadsheet, save the file as CURVE and in the "Save as type" box select "Unicode Text (*.txt)". Close the spreadsheet program then use your computer to change the file name from "CURVE.TXT" to "CURVE.DAT". Only one "CURVE.DAT" file can exist so you must over right the original file.

To import your custom curve, copy the file to an SD card, insert the card in the GEN VI then select: **Config**, **System**, **Import/Export**, **Import Curve**.

3.10.4 Source

The GEN VI channels can be *individually configured* to be controlled by either:

- **DMX only**. When configured for "DMX Only" a channel is controlled from a DMX lighting controller.
- **Auto Power**. Channels configured for "Auto Power" are used to provide power to non-dimmable fixtures whenever the lighting controller is switched on and hence a DMX signal is detected on the input to the GEN VI. When "Auto Power" is enabled (see section 3.8.4), channels configured for "Auto Power" will be *automatically* switched ON at full level whenever any valid DMX signal is detected. These channels will remain on for a programmable "hold time" when DMX is no longer detected. GEN VI switched output provides direct power by utilising relays guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads. "Auto Power" can only be selected if the channels curve is set to "TruPower". See section 3.10.3 or section 3.7.

3.10.5 Default Channel Settings

The default settings for channel parameters are;

ATTRIBUTE	DEFAULT SETTING
Min Level	0%
Max Level	100%
Fade Curve	Linear Curve
Control Source	DMX Only

3.11 COLOUR THEME MENU

Selecting **Config**, **Colour Theme** provides menus for changing the colour of the display. The choices are:
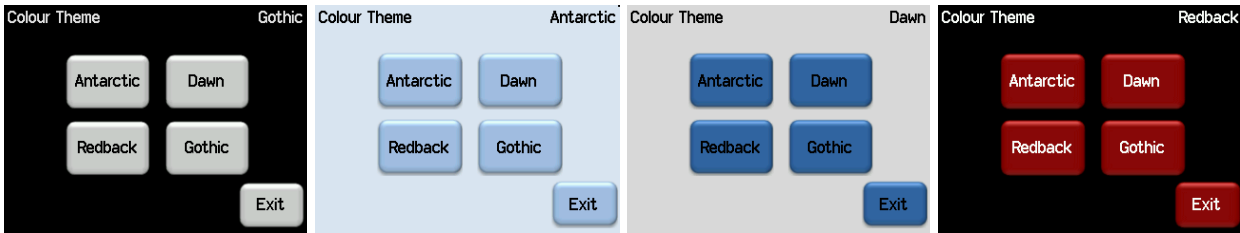
The default colour is "Gothic".

3.12 SYSTEM MENU

Selecting **Config**, **System** provides menus for the following functions:
- Code Upgrade.
- Reset.
- Service. (Factory use only).
- Fan Control.
- Import Export.
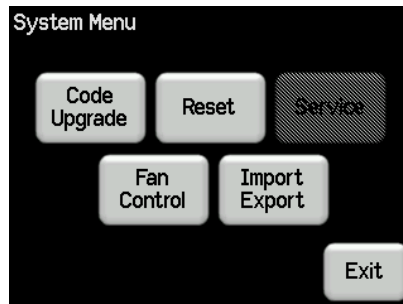
3.12.1 Code Upgrade

LSC Control Systems has a corporate policy of continuous improvement to its products. The GEN VI dimmer software (firmware) is subject to this policy as new features are added and existing features improved. The software version of your GEN VI dimmer can be checked from the "Dimmer Output" home page by pressing **Status**, **About**.

To upgrade your GEN VI software, download the latest version from the LSC web site, www.lsccontrol.com.au and save the new software to an SD Card. Both HC and low density format cards are supported. The file will be called "GNV_V*.bin" where * is the version number.
Press **Config**, **System**, **Code Upgrade**.

Insert the SD card and follow the onscreen instructions.

3.12.2 Reset

The GEN VI provides two different types of reset function. Press **Config**, **System**, **Reset.**

3.12.2.1   Restart

In the unlikely event that the GEN VI fails to respond, the operating system may be restarted so that the software may initialise and recommence normal operation. Performing a restart will not affect any of the settings or memory.

3.12.2.2   RESET To Defaults

This will ERASE all memory from the GEN VI (except the owner name) and reset to defaults.

3.12.3 Fan Control

The internal fan in the GEN VI is used to control its temperature. To set the fan control press **Config**, **System**, **Fan Control**.
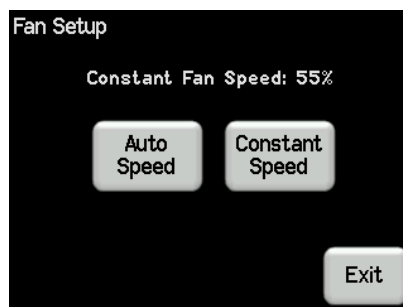
There are two choices of fan control:
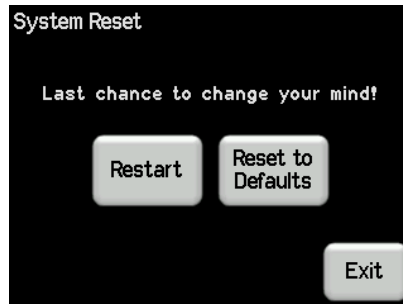- **Auto Speed**. The fan runs automatically when required. The higher the temperature the faster the fan runs.
- **Constant Speed**. The fan runs constantly at a speed that you set from the touchscreen. The speed range is from 0 to 100%. The letter "C" is displayed beside the fan symbol on the home page. If the temperature exceeds 65 Celsius the fan will run at full speed.

3.12.4 Import Export

The configuration and/or dimmer curve of your GEN VI dimmer can be exported to or imported from an SD card. This is useful for cloning the configuration to other units or for archiving. The SD card slot is located on the front panel. The configuration file name is fixed as "GNW_CFG.XML". If you need to use multiple configurations than you should either use a separate SD card for each configuration or use a single SD card and manage your files on a computer.

To export or import a file press **Config**, **System**, **Import/Export**.
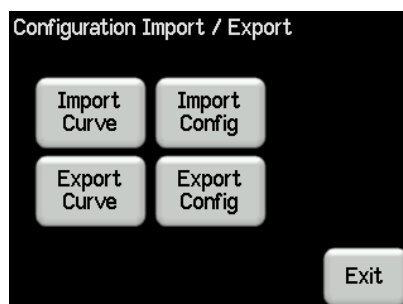
If there is no SD card in the dimmer or no file on the card then the import buttons are greyed out.

3.13 LOCK / UNLOCK

To **lock** the touchscreen of the GEN VI and prevent unauthorised access press **Config**.
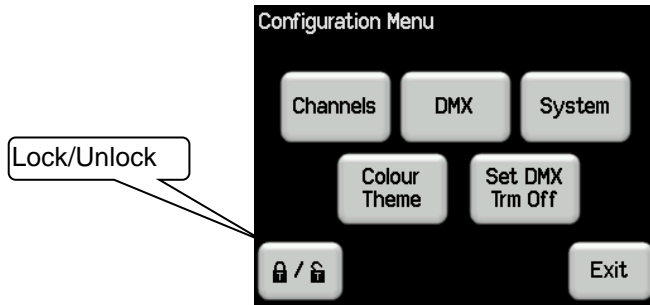
Pressing the "Padlock" symbol provides 3 levels of lock.
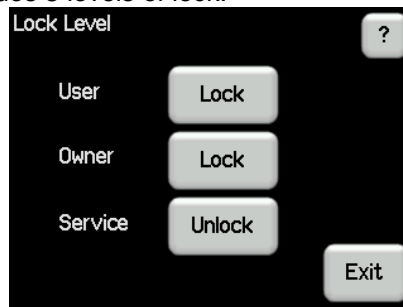
- User. Locks out the "Config", "Rigger's Control" and "DMX Address" menus.
- Owner. Locks out the "Config" menus.
- Service. Locks out the "Service" menu.

*Note: The "*Service*" menu is used for factory setup and has no user functions. It is always locked.*

Pressing a **Lock** button reveals a "Lock" keypad. Enter a four-digit code and the **Lock** button appears.
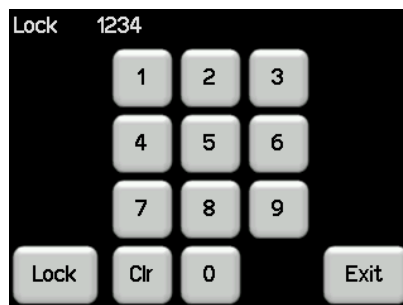
Press **Lock** to lock the selected level.

If "User" or "Config" are locked, the "Config" button is replaced by a **Padlock** symbol.
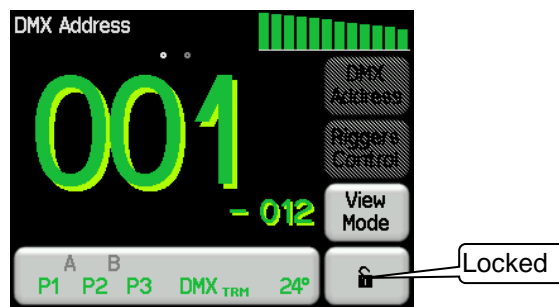
To unlock, press the [🔓] symbol and enter your four-digit code.

4   Alarms and Troubleshooting

Warning. No user controls or user serviceable parts are located <u>inside</u> the GEN VI Dimmer. Refer all servicing to suitably qualified personnel.

4.1 MAINTENANCE

Ensure that the air vents are free from dust.
Check that the GEN VI contains the latest software release.

4.2 ALARMS

The Status bar at the bottom of the "Home Screens" indicates the following:

- **Auto Power** shows the status of the "Auto power" function that switches on selected channels when DMX is present. See section 3.8.4
  Blue is active. Grey is not active.

- **DMX Backup** is the "DMX loss" memory. See section 3.8.3
  Blue is active. Grey is not active.

- **P1**, **P2**, **P3** show the presence of the input power phases.
  Green indicates power is present. Flashing red is not present.

- **DMX** shows the presence of a DMX control signal.
  Green is DMX present. Flashing Red is not present.

- **16-bit** indicates that DMX control is using 16-bit resolution. See section 3.8.2

- **TERM** indicates that the DMX line is terminated by the GEN VI dimmer. See section 3.9

- The GEN VI has an internal cooling fan. The fan symbol is displayed when the fan is running. The fan speed can be controlled. See section 3.12.3.

- The internal temperature of the GEN VI is shown in degrees Celsius. The colour warns you if the temperature is too high.
  - At normal temperatures the display is green.
  - At 65C the display turns yellow.
  - At 75C the display turns red.
  - At 85C it flashes red.
  - At 90C the <u>ALL OUTPUT is automatically switched OFF</u>. A WARNING IS DISPLAYED ON ALL PAGES OF THE SCREEN.
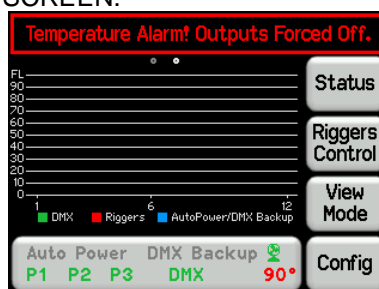
Either reduce the load or increase the cooling to reduce the temperature. If the fan has been set to a constant slow speed either increase the speed or set it to "Automatic". See section 3.12.3. Also check that the fan is operating and that the sides of the dimmer are not blocked.

When the temperature drops below 86 degrees the outputs are automatically switched back on.

Touching **Auto Power DMX Backup ⚥ / P1 P2 P3 DMX _TERM_ 43°** shows the legend for the display……
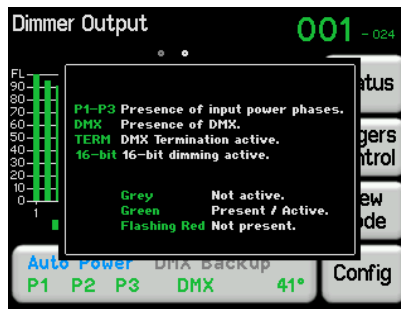
Touch anywhere within the legend window to close.

4.3 TROUBLE SHOOTING

If a channel is not working check the Circuit Breaker for that channel.

If the Circuit Breaker has tripped (OFF), firstly try to determine the cause of the breaker tripping. It could be a blown lamp, a circuit overload or and earth leakage fault. Rectify the problem (replace the lamp or reduce the load) then restore the Circuit Breaker. If the Circuit Breaker continues to trip, refer the problem to a suitably qualified person.

If a channel will not turn on check the following:
- The fade curve is not set to "TruPower".
- The Maximum level is not set too low.
- Ensure that the load is plugged in.
- If a custom dim curve is selected change to a S or L curve. If the channel now comes on, check the custom curve.

If a channel will not turn off check the following:
- The Minimum level is set at 0%.
- Rigger's control is set to 0%.
- Channel is not set to "Auto Power".

4.3.1 Rigger Test

You can test the operation of a dimmer channel from the Rigger's Control on the LCD touchscreen. See section 3.5

4.3.2 DMX Control

If the dimmer is working from the rigger's control but not via DMX, check that the dimmer is patched to the correct DMX slot and correctly configured for DMX control.

You can check the DMX input signal from the touchscreen. See section 3.8.5

5   DMX Explained

5.1 OVERVIEW

DMX512/1990-A is the industry standard for the transmission of digital control signals between lighting equipment. It utilises just a single pair of wires on which is transmitted the level information for the control of up to 512 DMX slots (addresses or channels).

The information for each slot is sent sequentially. The level of slot 1 is transmitted, then the level of slot 2, then 3, etc. up to a maximum of 512 slots. This stream of data containing the levels for all 512 DMX slots is repeated a minimum (Generally) of 44 times per second. This provides sufficient updates of channel information for smooth fade transitions.

As the DMX512-A signal contains the level information for all slots, each piece of equipment needs to be able to read the level(s) of the slots(s) that apply only to that piece of equipment. To enable this, the GEN VI dimmer has a "DMX Patch" menu that allows you to patch (connect) each DMX slot (address) from your lighting controller to a GEN VI channel number or to multiple channel numbers.

When good quality data cables are used, DMX512 cable runs may be up to 1,000 metres in length. When several DMX feeds are required (to feed different locations), DMX512 splitters must be used. These provides multiple isolated DMX512 feeds.

The GEN VI uses a high impedance DMX input circuit allowing you to loop the DMX signal from one GEN VI to the next. The last GEN VI in the chain must have the "DMX Terminate switch" set to TERM to terminate the line.

Note: Do not use unscreened microphone or low speed data cables for DMX. This can cause problems in the DMX network. Make sure the cable conforms to the EIA485 cable requirements by providing the following specifications:

- *Low capacitance*
- *One or more twisted pairs*
- *Foil and braid shielded*
- *Impedance of 85 -150 Ohms, nominally 120 Ohms*
- *22AWG gauge for continuous lengths over 300 metres*

5.2   TYPICAL DMX INSTALLATIONS

In the following example, the DMX output signal from the lighting control desk is fed to the DMX connector of the first GEN VI dimmer. The DMX cable is then looped to the following GEN VI dimmers. The order of the daisy chaining is not important as each GEN VI channel can be patched to any DMX slot number. The end of the DMX line is terminated to prevent the signal reflecting back up the line and causing possible errors.
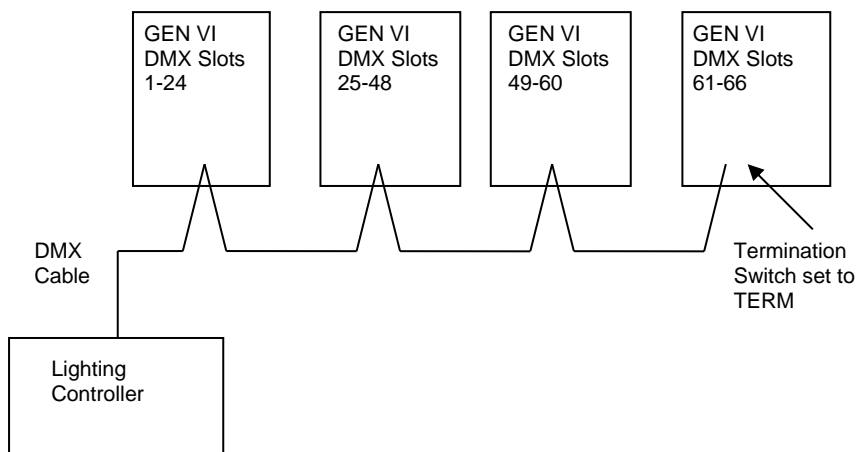
6   RDM Explained

6.1 OVERVIEW

RDM stands for Remote Device Management. It is an "extension" to DMX.

Since the inception of DMX it has always been a 'one way' control system. Data only ever flows in one direction, from the lighting controller outwards to whatever it may be connected to. The controller has no idea what it is connected to, or even if what it's connected to is working, switched on, or even there at all!

RDM changes all that allowing the equipment to answer back!

An RDM enabled moving light, for example, can tell you many useful things about its operation - the DMX address it is set to, the operating mode it is in, whether its pan or tilt is inverted and how many hours since the lamp was last changed.

But RDM can do more than that. It isn't limited to just reporting back, it can change things as well. As its name suggests, it can remotely manage your device.

RDM has been designed to work with existing DMX systems. It does this by interleaving its messages with the regular DMX signal over the same wires. There is no need to change any of your cables but because RDM messages now go in two directions, any in-line DMX processing you have needs to be changed for new RDM hardware. This will most commonly mean that DMX splitters and buffers will need to be upgraded to RDM capable devices.

To utilise RDM you will also need an RDM controller. Presently these are devices that plug in to the DMX line and talk the RDM language. They put the messages on to the DMX line, listen for any replies and display the results via an attached computer. The latest lighting consoles now also come with RDM controllers built in.

RDM also has the ability to read and report operating statistics and error conditions from any enabled equipment that supports it. This opens up the possibility of remotely monitoring the condition of your lighting rig and getting notice of failed equipment or even advanced notice of things that may be cause for concern. For example, a moving light that reports a very high bulkhead temperature may be suffering from a failed fan or clogged filter or a scroller that reports a high motor current may have a jammed scroll.

6.2 GEN VI RDM

LSC's GEN VI Dimmer range are RDM enabled products. This allows you to use RDM to change the DMX address of the dimmer and to interrogate the dimmer to find out its:
- Temperature.
- Fan Speed.
- Presence of input power phases 1-3.
- Presence of DMX.

The GEN VI will also send out an over temperature alarm when the temperature reaches 90 Celsius.

7   PTFD Explained

7.1 OVERVIEW

PTFD stands for "Pulse Transformer Fired Dimmer". It is a tried and proven piece of dimmer technology that is used in top quality dimmers including LSC's GEN VI range. However, many dimmer manufacturers now use low cost opto-isolator circuitry in their dimmers which can have some short comings as described below.

7.2 WHAT IS PTFD?

PTDF dimmers use a small "pulse transformer" to control their internal power control device, usually a triac or an SCR. We will use the Generic term "triac". The triac is the part of the dimmer that actually controls the voltage coming out of the dimmer to the load. A 12-channel dimmer needed 12 transformers, one per channel. The transformer is used to provide isolation between the high voltage (100-240v) mains output and the low voltage (~12v) of the dimmer electronics. A pulsed signal is fed into the input of the transformer, and the output is connected to the input of the triac. The result is a dimmer that can control virtually any type of connected load. This includes inductive loads such as anything with a transformer in it. Examples are pin spots, 12v EVL dichroic lamp systems, reactive loads, discharge lamps and fluorescent lamps.

In the 1980's a new integrated circuit device became available known as an "opto-isolator" (also known as an optocoupler or a MOC). This device uses a LED and a phototransistor to provide the same level of high-low voltage isolation as a pulse transformer but at a far lower cost. Due to the lower cost and the fact that an IC is easier to work with than a transformer in manufacturing, the vast majority of dimmer manufacturers switched to this great new device.

7.3 OPTO-ISOLATED PROBLEMS

The opto-isolators used in low-cost dimmers have one major disadvantage. They do not provide the power to drive the triac! Instead the dimmer circuitry relies on the connected load to power the triac. Therefore, the opto-isolated dimmer's performance is dependent on the load connected to it. In the case of a simple high-power load such as a 1000-watt lamp this is not usually a problem. The problems occur when you try to control any of the following loads:

- Very low power circuits such as a 15w festoon lamp.
- Inductive loads, such as Pin spots or ELV 12v dichroic lamp systems.
- Transformers such as gobo rotator power supplies.
- Motors, such as mirror ball rotators.
- Motorised Disco Effects. These often contain a motor and a transformer.
- Reactive loads such as Intelligent lights, Discharge lamps and Fluorescent lamps

If the load is very small there is just not enough power to fire the triac. The result is that most opto-isolated dimmers require a minimum load of 100 watts in order to work. If the load is inductive or reactive then there is a problem with the voltage and current getting out of phase with each other which can cause a false trigger of the triac, which causes the lights to flicker or flash. If the load is both of the above such as a small transformer driving a gobo rotator or a 35-watt dichroic lamp then some opto-isolated dimmers will turn on but never turn off, so your light or gobo rotator keeps working at full power, even with the dimmer control at zero!

A PTFD dimmer rack does not have any of these problems. It simply dims the light as the operation of the triac is completely independent of the load.

7.4 HARD FIRING

Some manufacturers use opto-isolators but employ a technique called "Hard Firing" to try and overcome the problems listed above. Hard firing involves sending a string of small pulses to the opto-isolator (just like we do with our PTFD's), so that if/when the triac misfires or turns off from a lack of power, it will automatically re-trigger. Whilst this can help the situation the dimmer still cannot control certain loads. Some sales jargon will try to convince you that Hard Firing solves all the problems with opto-isolation. It does not!

7.5 THE PROOF

The best way to prove this is to demonstrate the problem. LSC staff carry a pin spot, a 12v desk lamp with transformer and a mirror ball motor with them when they do demonstrations. The LSC PTFD dimmers can control all of these devices without any problem. Almost all opto-isolated dimmers fail this demonstration completely. The mirror ball motor does not start or if it does it never stops. The pin spot flickers at low levels and the 12v desk light cannot be dimmed and stays on at full brightness as the dimmer channel is dimmed up and down.
LSC GEN VI dimmers are PTFD dimmers.

8   Specifications

8.1 RACKMOUNT GEN VI SPECS

		GEN12/13	GEN12/16	GEN6/25
Channels		12	12	6
Max Load per channel		10 Amps	16 Amps	25 Amps
Thermo-Magnetic Breakers		YES	YES	YES
RCD/GFI protection		YES	YES	YES
RCD/GFI Current Trip		30mA/Channel		
Operating Temperature range		0-40°C		
Output Connector Options	/A	12 x 3-pin 10A Australian GPO style connectors	N/A	6 paired Australian GPO outlets (20A + 15A per channel)
	/S	12 x Schuko Connectors		N/A
	/T	Hardwired (terminals)		
	/W	2 x Wieland 16-pin multi-pole connectors		N/A
	/X	2 x 19-pin Socapex multi-pole connectors		N/A
Power Supply		Nominal 100-240 Volts. 3-phase star with fully rated neutral. 50-60Hz (single-phase operation possible - 63A max) Operating range typically 90-260V, 45-65Hz. Earthing System: TN-S		
Power Input Connection		Australian models are fitted with a 3-phase 1.2m H07 rubber 5 core x 6.0mm^2 cable with 40A 5 pin Clipsal plug fitted as standard. Export models are supplied with an M25 Nickel Plated Brass cable gland for installing power cable. A 1.2m length of 3-phase cable provided with the GEN VI (but not fitted). Hardwired models are provided with 5 screw terminals for input power - no cable.	Export models are supplied with an M25 Nickel Plated Brass cable gland for installing power cable. A 1.2m length of 3-phase cable provided with the GEN VI (but not fitted). Hardwired models are provided with 5 screw terminals for input power - no cable.	Australian models are fitted with a 3-phase 1.2m H07 rubber 5 core x 6.0mm^2 cable with 40A 5 pin Clipsal plug fitted as standard. Export models are supplied with an M25 Nickel Plated Brass cable gland for installing power cable. A 1.2m length of 3-phase cable provided with the GEN VI (but not fitted). Hardwired models are provided with 5 screw terminals for input power - no cable.
Control Input		DMX512 (1990) or DMX512-A (E1-11) and RDM (E1-20) via front panel mounted 5-pin AXR in and thru connectors		
Case		19" 3RU rackmount		
Product Dimensions - W x D x H		483 x 300 x 132 mm		
		19.0 x 11.8 x 5.25 inches		
Shipping Dimensions - W x D x H		580 x 500 x 210 mm		
		22.8 x 19.7 x 8.25 inches		
Product Weight (Packed):		18.5kg	21kg	18.5kg
		40.7lb	46.2lb	40.7lb
Shipping Weight (Australia)		18.5kg	21kg	18.5kg
Shipping Weight (Export)		18.5kg	21kg	18.5kg
		40.7lb	46.2lb	40.7lb

8.2 WALLMOUNT GEN VI SPECS

		GVW12/13	GVW6/25
Channels		12	6
Max Load per channel		10 Amps	25 Amps
Thermo-Magnetic Breakers		YES	YES
RCD/GFI protection		YES	YES
RCD/GFI Current Trip		30mA/Channel	
DMX-512A input with RDM functionality		YES	YES
Control Surface		3.2" colour LCD with touchscreen	
Pre-heat (min) and Top set (max) levels per channel		YES	YES
Remote monitoring and control via RDM		YES	YES
Auto Power Mode - switches Relay channels On when DMX is applied and Off when DMX is no longer present		YES	YES
Dimmer channels can be 8-bit or 16-bit		YES	YES
Visual Alarms for Phase fail, over temperature and loss of DMX		YES	YES
PTFD Dimming (Pulse Transformer Fired Dimming)		YES	YES
Local Rigger's Control		YES	YES
Fan Control		Auto or user programmable speed	
Colour Touchscreen with simple and intuitive navigation		YES	YES
Dimming Curves		4	
Operating Temperature range		0-40ºC	
Output Connector Options	**/A**	12 x 3-pin 15A Australian GPO style connectors	6 paired Australian GPO outlets (20A + 15A per channel)
	/T	Hardwired (terminals)	
Power Supply		Nominal 100-240 Volts. 3-phase star with fully rated neutral. 50-60Hz Operating range typically 90-260V, 45-65Hz. Earthing System: TN-S	
Power Input Connection		An M32 Nickel Plated Brass cable gland for installing power cable is supplied but not fitted.	
Control Input		DMX512 (1990) or DMX512-A (E1-11) and RDM (E1-20) via right-hand side panel mounted 5-pin AXR in and thru connectors	
Product Dimensions - W x D x H		490 x 270 x 250mm	
		19.3 x 11 x 9.8 inches	
Shipping Dimensions - W x D x H		550 x 340 x 310 mm	
		21.7 x 13.4 x 12.2 inches	
Product Weight:		21.5 kg / 47.3 lb	21.5 kg / 47.3 lb
Product Weight (Packed):		25 kg / 55 lb	25 kg / 55 lb
Shipping Weight (Australia)		25 kg / 55 lb	25 kg / 55 lb
Shipping Weight (Export)		25 kg / 55 lb	25 kg / 55 lb

9   Compliance Statements

9.1 RCM COMPLIANCE

The GEN VI Dimmer from LSC Control Systems complies with the Regulatory Compliance Mark (RCM).

9.2 CE COMPLIANCE STATEMENT

The GEN VI Dimmer from LSC Control Systems has been designed and tested to the European Committee for Electrotechnical Standardization (CENELEC) standard– EN55022 (Information Technology Equipment).

9.3 C TICK COMPLIANCE STATEMENT

All LSC products with CE Compliance automatically comply with C-Tick requirements as per Section 182 of the Radio-communications Act 1992. LSC Company Registration number is N921.