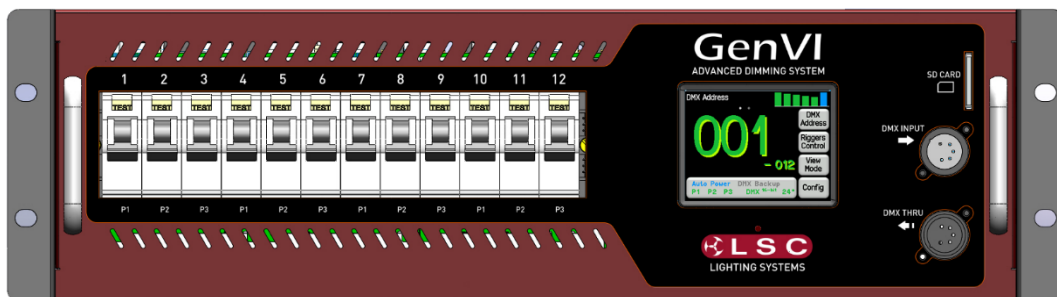


GenVI

Advanced Dimming System



INSTALLATION and OPERATION

Version V 1.0

Covering software Version 1
January 2014
Document number: GenVI-T01U-A1

LSC Lighting Systems (Aust) Pty. Ltd.

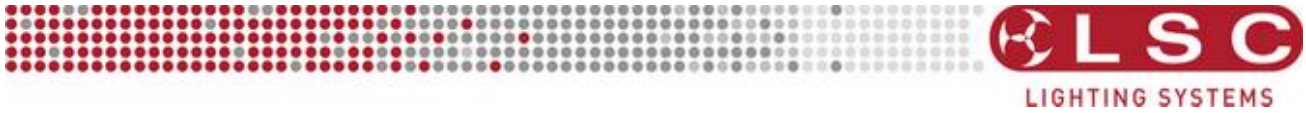
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Contents

1 Product Description	1		
1.1 About this Manual	1	3.8.5 View Input	19
1.1.1 Conventions Used in this Manual	1	3.9 System Menu	19
1.2 Overview	1	3.9.1 Code Upgrade	20
1.2.1 Features	1	3.9.2 Reset	20
1.2.2 GenVI Control Philosophy	1	3.9.3 Fan Control	21
1.3 Models	2	3.10 Colour Theme Menu	21
1.4 Factory Fitted Options	2	3.11 Set DMX Term	21
1.4.1 Output Connections	2	3.12 Lock / Unlock	21
1.4.2 100-120VAC Input Power	2		
1.4.3 3 Phase Delta Input Power	2	4 Alarms and Troubleshooting	23
1.5 Front Panel	2	4.1 Maintenance	23
1.6 Rear Panel	2	4.2 Alarms	23
		4.3 Trouble Shooting	24
2 Installation	4	4.3.1 Rigger Test	24
2.1 Safety	4	4.3.2 DMX Control	24
2.2 Unpacking	4		
2.3 Connections	4	5 DMX Explained	25
2.3.1 Input Power Supply	4	5.1 Overview	25
2.3.2 Connecting DMX512	4	5.2 Typical DMX Installations	25
3 Menu System	5	6 RDM Explained	26
3.1 Overview	5	6.1 Overview	26
3.2 Help Screens	5	6.2 GenVI RDM	26
3.3 Home Pages	5		
3.3.1 DMX Address Home Page	5	7 PTFD Explained	27
3.3.2 Dimmer Output Home Page	6	7.1 Overview	27
3.4 Dimmer Status	7	7.2 What is PTFD?	27
3.5 Riggers Control	9	7.3 Opto-isolated Problems	27
3.5.1 Chaser	9	7.4 Hard Firing	27
3.6 Config Menu	9	7.5 The Proof	28
3.7 Channels Menu	10		
3.7.1 Min Level	12	8 Specifications	29
3.7.2 Max Level	12		
3.7.3 Curve	12	9 Compliance Statements	30
3.7.4 Source	12	9.1 CE Compliance Statement	30
3.7.5 Default Channel Settings	13	9.2 C Tick Compliance Statement	30
3.8 DMX Menu	13		
3.8.1 Patch	13		
3.8.2 16 Bit DMX Control	14		
3.8.3 DMX Loss Memory	15		
3.8.4 Auto Power	18		

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1 Product Description

1.1 ABOUT THIS MANUAL

This manual describes the installation, configuration and operation of the GenVI range of advanced dimmers manufactured by LSC Lighting Systems.

1.1.1 Conventions Used in this Manual

There are four different colour themes that you can select on the GenVI touch screen. The screen images in this manual use the default "Gothic" colour theme.

Throughout this manual, certain conventions have been used to make the meaning clearer.

- A word in **Bold** text represents a button on the touch screen.
- Emphasis is indicated by underlining.
- *Notes or Hints are displayed in italic font*

1.2 OVERVIEW

The GenVI dimmers can be controlled by any DMX512 or RDM lighting controller. Dimmer configuration, patching and local control is achieved via a backlit colour touch screen 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 GenVI 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:
 - DMX address patching.
 - Minimum and maximum output levels.
 - Choice of two fade curves (linear or s) or switched power output. Switched (LSC Trupower) output provides direct power by utilising relays guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads.
- LSC's proprietary Current Control Technology © (CCT) protects all RCBO's from nuisance tripping due to cold lamp inrush currents.
- 13amp or 10amp per channel models.
- Choice of output connectors.
- 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 GenVI Control Philosophy

Each GenVI 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 GenVI.
- 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 touch screen by selecting **Riggers Control**.

1.3 MODELS

The GenVI is available in two models:

- 10 amps per channel.
- 13 amps per channel.

1.4 FACTORY FITTED OPTIONS

1.4.1 Output Connections

Various output connector options are available. See the "Rear Panel" section below for details.

1.4.2 100-120VAC Input Power

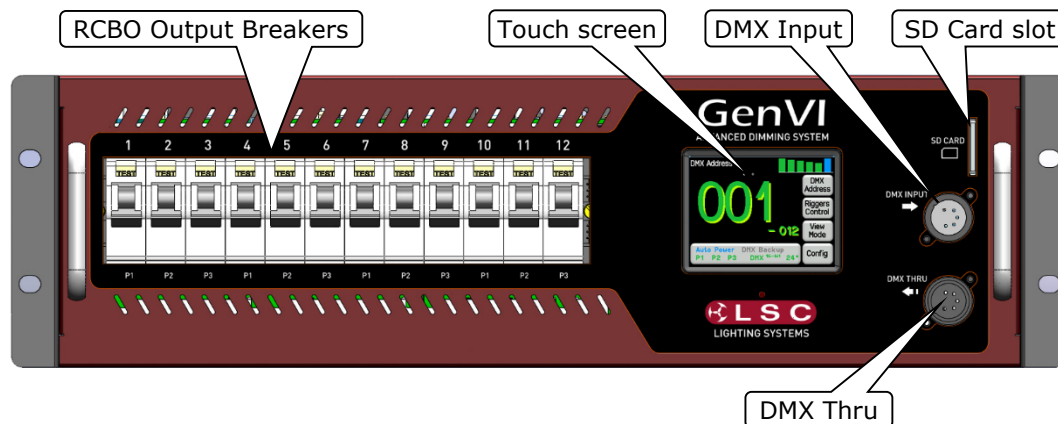
GenVI can be supplied for 100-120VAC input power operation.

1.4.3 3 Phase Delta Input Power

GenVI can be supplied wired for 3 phase Delta input power operation.

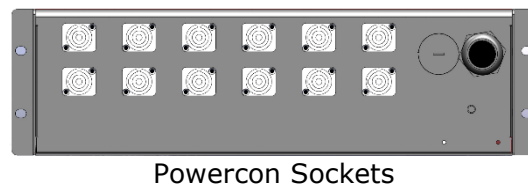
1.5 FRONT PANEL

The front panel contains the DMX input and through connectors, load RCBO's (Residual Current Breaker (RCD/GFI) with Overcurrent and Neutral disconnect), SD card slot (used for software upgrades) and LCD touch screen.



1.6 REAR PANEL

GenVI dimmers can be supplied with the following types of rear mounted load connections:





Weiland Sockets



Socapex Sockets



Shuko Sockets



Installation Screw Terminals

2 Installation

2.1 SAFETY

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

2.2 UNPACKING

The GenVI 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 CONNECTIONS

2.3.1 Input Power Supply

The **GenVI** 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. 3 phase Delta and 100-120VAC versions are available by special order from the factory.

The GenVI can be powered from:

- Three phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 40 Amps per phase. See Neutral rating note above.
- Single phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 120 Amps.

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

2.3.2 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 3.11

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

3 Menu System

3.1 OVERVIEW

The GenVI dimmer uses a touch screen 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.

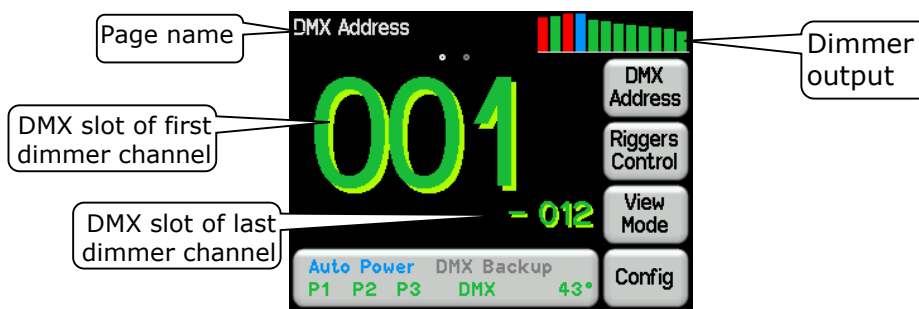
3.3 HOME PAGES

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 "Riggers Control" and "Config" menus.

3.3.1 DMX Address Home Page

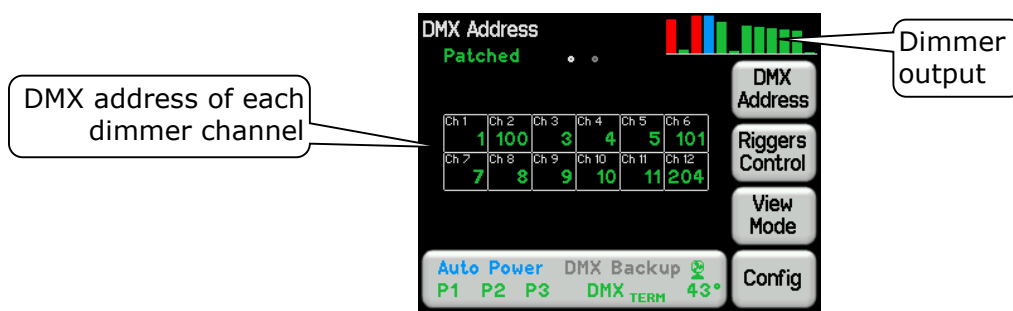
The "DMX Address" home page has two formats:

- 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.



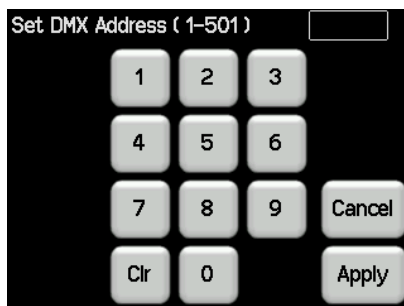
"DMX Address" Home Page with channels individually patched

Individual channel patching is performed in the DMX menu. See section 3.8.1

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.

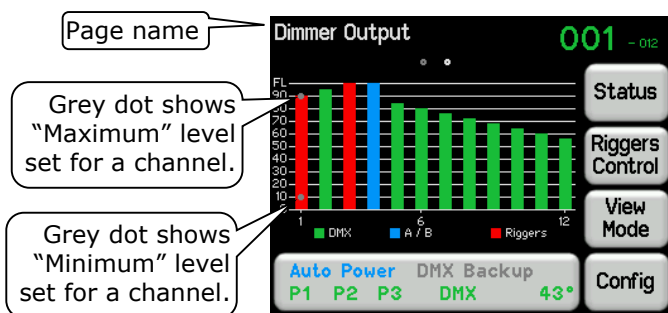
3.3.1.1 DMX Address

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 GenVI 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 GenVI then press **Apply**.

3.3.2 Dimmer Output Home Page



"Dimmer Output" Home Page

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

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

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

If a minimum or maximum level has been set for a channel they are indicated by grey dots on the channels bargraph.

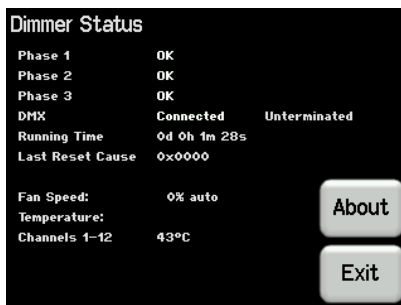
The top right corner of the screen shows the DMX address information.

- 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....

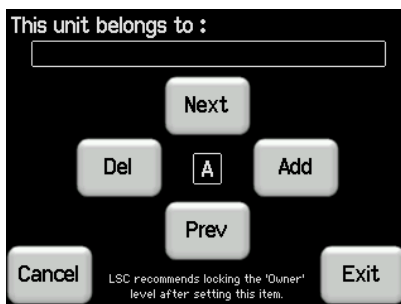


It shows the presence of the input power phases, DMX presence, position of the DMX termination switch, dimmer running time, last cause of a reset, internal temperature and the fan speed and fan setting (constant speed or automatic).

Pressing **About** shows the software versions, RDM ID and the optional "Owner" name.

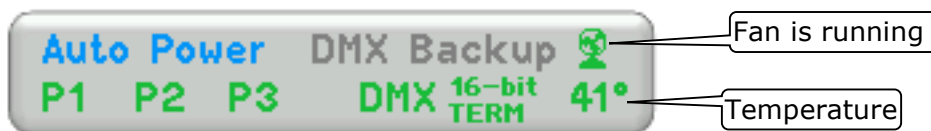


Pressing **Owner** allows you to enter a name for the dimmer. This owner name can be password locked. See section 3.12



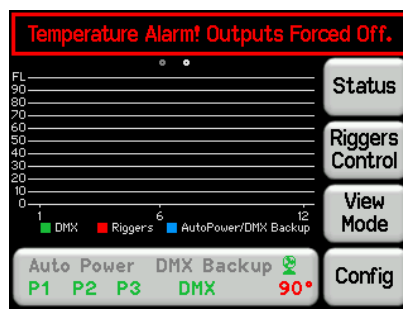
3.4 DIMMER STATUS

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.

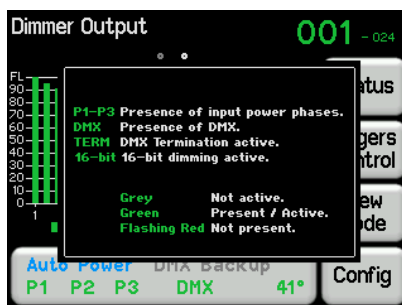
- **P1, P2, P3** show the presence of the input power phases. Green indicates power is present. Flashing red is not present.
- **DMX** shows the presence of a DMX control signal. Green is DMX present. Flashing Red is not present.
- **16-bit** indicates that DMX control is using 16 bit resolution. See section 3.8.2
- **TERM** indicates that the DMX line is terminated by the GenVI dimmer. See section 3.11
- The GenVI has an internal cooling fan. The fan symbol is displayed when the fan is running. The fan speed can be controlled. See section 3.9.3.
- The internal temperature of the GenVI 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 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 3.9.3.

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

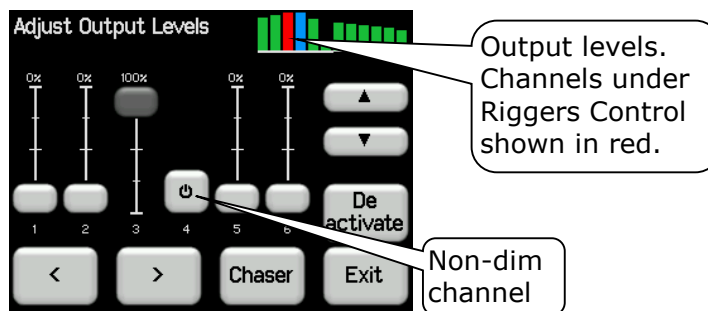
Touching shows the legend for the display.....



Touch anywhere within the legend window to close.

3.5 RIGGERS CONTROL

To set the level of a channel(s) (or run a chaser) from the touch screen, from either home page (above) press **Riggers Control**.



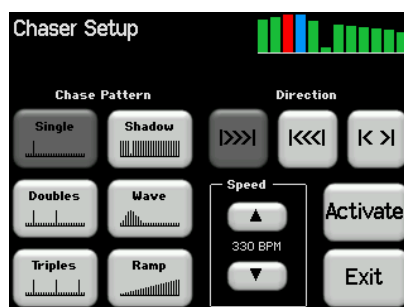
The output of the Riggers Controls can be turned off or on by pressing **De activate/Activate**. Channels are controlled on a HTP (highest Takes Precedence) basis. If multiple sources are controlling a channel (such as DMX and Riggers Control) then the highest level will be output.

To set the level of a channel(s), use the virtual faders or touch a fader then use the ▲ or ▼ buttons. "Non-dim" 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 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 |>>>| (forward), |<<<| (reverse) or |<>| (bounce from end to end).

To disable the Chaser press **De-Activate**.

When finished press **Exit**.

3.6 CONFIG MENU

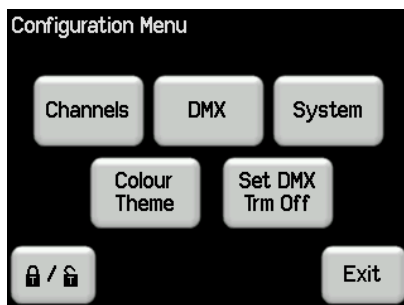
From either home page, pressing **Config** allows you to access a range of functions and setups via sub-menus.



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



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



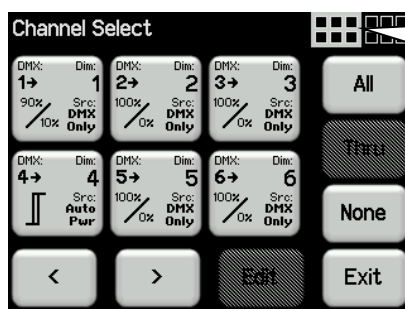
The following table shows the functions that can be performed in each sub menu.

Channels	DMX	System
Min Level Max Level Curve Source	Patch View DMX Input levels Edit DMX Loss Memory & Delay Time Fade In/Out DMX Loss memory Enable Auto Power Auto Power Hold Time	Code Upgrade Reset Fan Control
Lock	Colour Theme	Set DMX Term
User Owner Service	Antarctic Dawn Redback Gothic	On/Off

3.7 CHANNELS MENU

Selecting **Config, Channels** provides menus for configuring the following parameters for each channel:

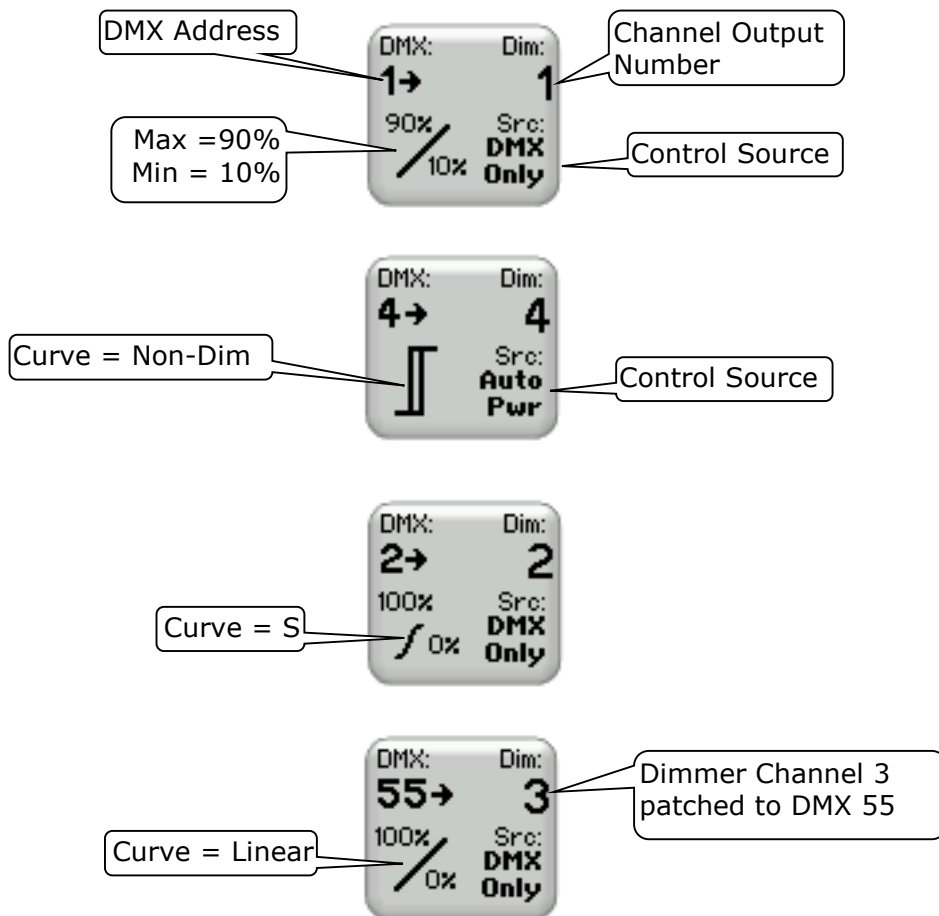
- Min. Minimum Level
- Max. Maximum Level
- Curve. The choices are: S curve dimming, L (Linear) dimming or Non Diming.
- Source. The control source for the channel. The choices are: "DMX only" and "Auto Power" (On at full whenever DMX is present).



Navigator shows current group of 6 selected channels highlighted

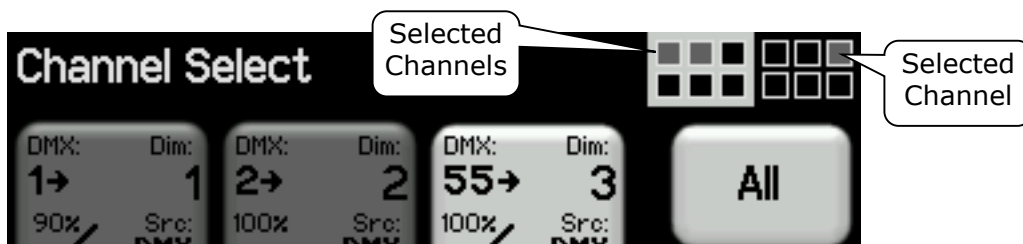
The screen shows the settings for the first 6 channels. Use the < or > buttons to see the other groups of 6 channels. The navigator in the top right of the screen shows the selected group highlighted. Each channel button shows the settings for that channel.

For example:



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.

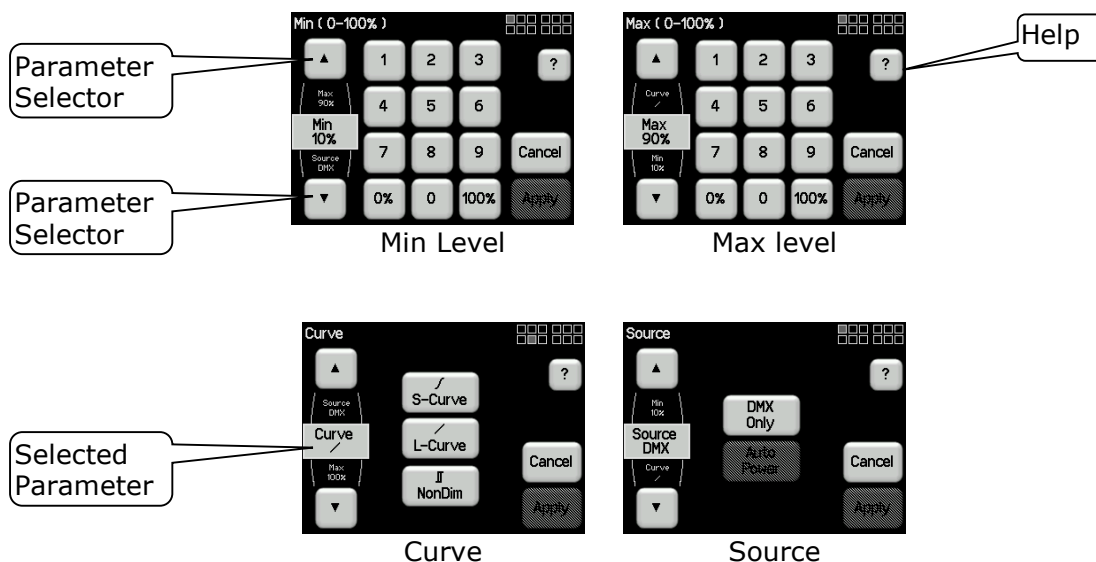
The selected channels are highlighted in the navigator:



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).



- A channel must be set to the “NonDim” curve before “Auto Power” can be selected as the “Source”.
- If a channel is set to “NonDim” 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.

3.7.1 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.

3.7.2 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.

3.7.3 Curve

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

- S curve
- Linear curve
- Non Dim

When a channel is set to “Non Dim”, the channel will switch from OFF to full ON when the control signal is raised above 60% and when the level drops below 40%, the channel will switch OFF. “NonDim” is used for devices that do not fade, but need to be switched OFF or ON such as motors or discharge lamps. Min and Max level are not available when Non Dim is selected. GenVI “Non Dim” output provides direct power by utilising relays guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads.

3.7.4 Source

The GenVI 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 GenVI. 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. GenVI switched output provides direct power by utilising relays guaranteeing there are absolutely no electronics in the circuit to interfere with connected loads.

3.7.5 Default Channel Settings

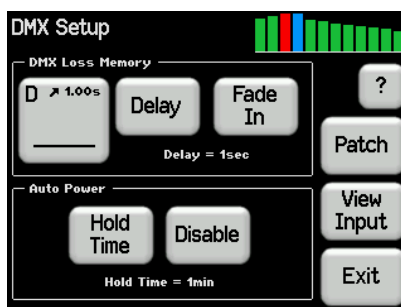
The default settings for channel parameters are;

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

3.8 DMX MENU

Selecting **Config, DMX** provides menus for:

- Patching DMX.
- Editing and activating the DMX Loss (D) memory.
- Enabling and time setting the Auto Power function.
- Viewing the Input DMX signal.



3.8.1 Patch

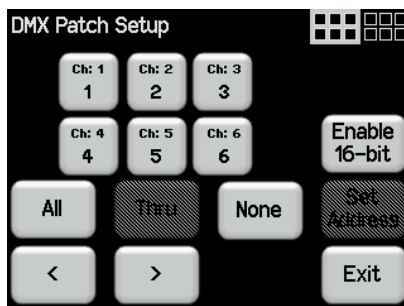
Each GenVI dimmer unit numbers its channels from channel 1 through to channel 12. The patch menu allows you to patch (connect) DMX slots (addresses) from your DMX lighting controller to GenVI channel numbers. Patches are often performed in contiguous blocks of addresses.

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

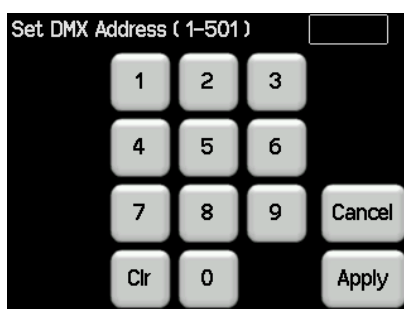
The “Patch” menu allows you to individually patch dimmers channels to DMX slots. Individual patches are required when;

- A particular *DMX slot number* from the lighting controller is to control a particular GenVI dimmer *channel number*.
- A single DMX slot number is to control multiple GenVI channel numbers.

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



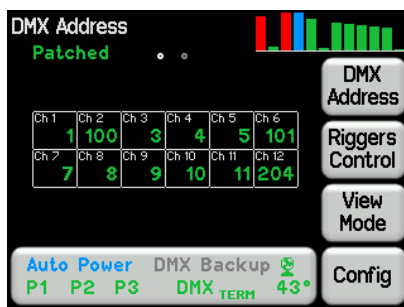
The menu shows the first 6 channels. Use the < or > buttons to see the other groups of 6 channels. Touch a channel to select it. You can select multiple channels. To select a range of channels select your first channel then press **Thru** then your last channel. Use **All** to select all channels. Press **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 patch them one at a time. 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:

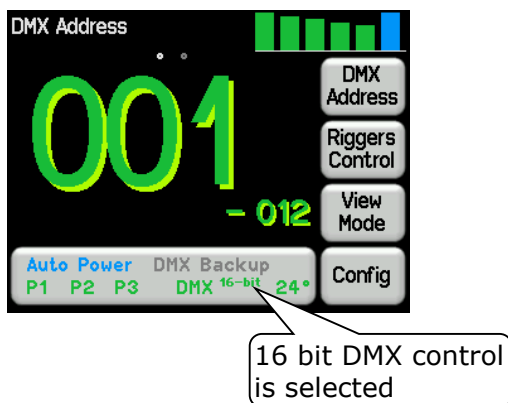


3.8.2 16 Bit DMX Control

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 GenVI 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 show you when 16 bit DMX control is selected.

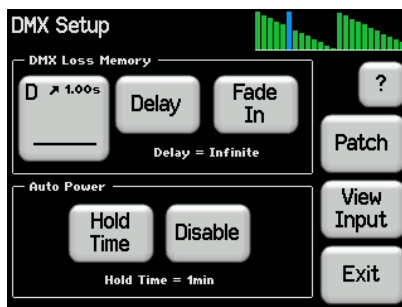


See section 5 for more information on DMX.


3.8.3 DMX Loss Memory


The GenVI 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 GenVI will fade back (in 1 second) to the DMX signal.

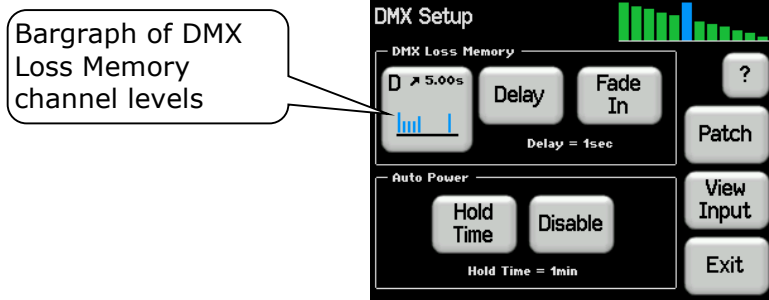
To create or edit a "DMX Loss Memory" press **Config, DMX**.



The "DMX Loss Memory" pane has 3 buttons:


- Press  to create or edit the memory as described below.
- Press **Delay** to set the time that the GenV 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  button shows a bargraph display of the current DMX Loss memory (if any) and also its fade time in seconds. For example,

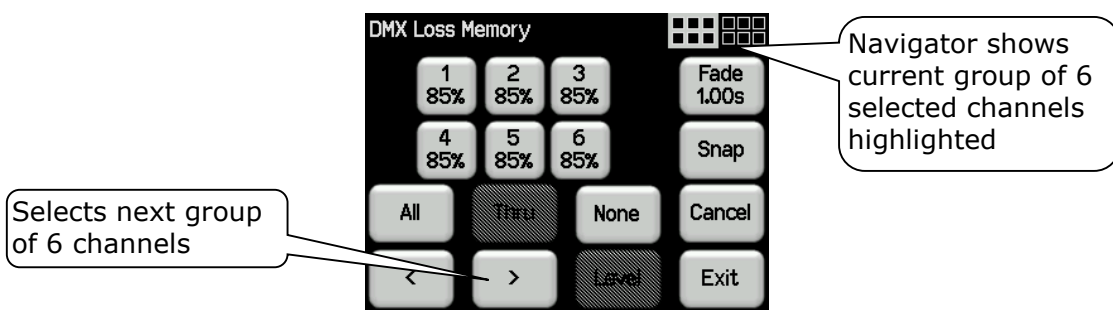


Bargraph of DMX Loss Memory channel levels



When you press , 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.

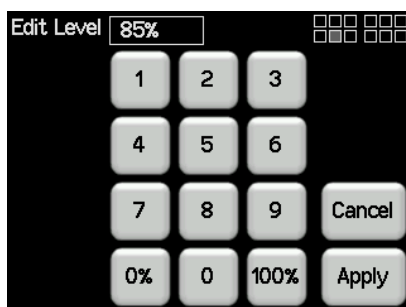


You can also set a fade time for the DMX Loss Memory.

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.

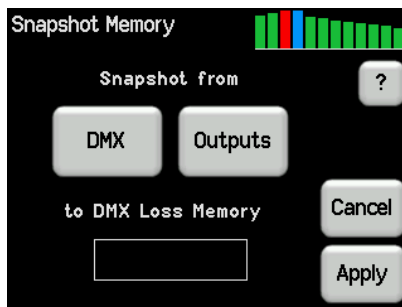
Touch a channel to select it. You can select multiple channels. To select a range of channels select your first channel then press **Thru** then your last channel. Use **All** to select all channels. Press **None** to de-select all channels. When you have selected your channel(s) press **Level**.



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

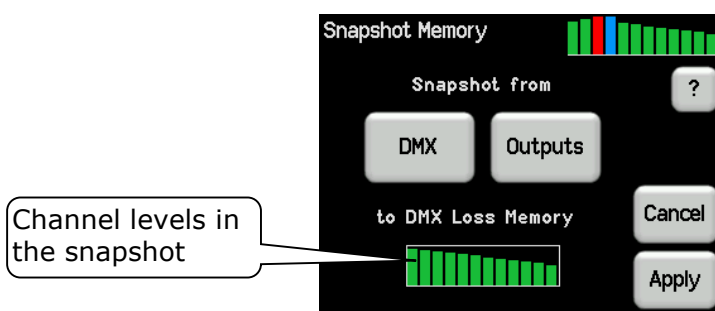
3.8.3.2 Taking a Snapshot

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 GenVI. These channel levels could be coming from DMX or Riggers Control or a combination of both.

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



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

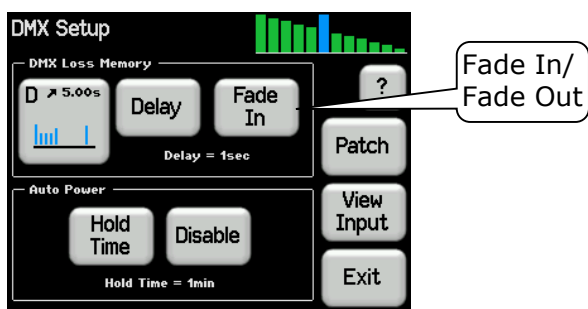
When editing the DMX Loss memory (above), you can set a fade (in/out) time for the memory by pressing **Fade**.



Enter a time in seconds (0 to 99.99) then press **Apply**.

3.8.3.4 Fade In/Out

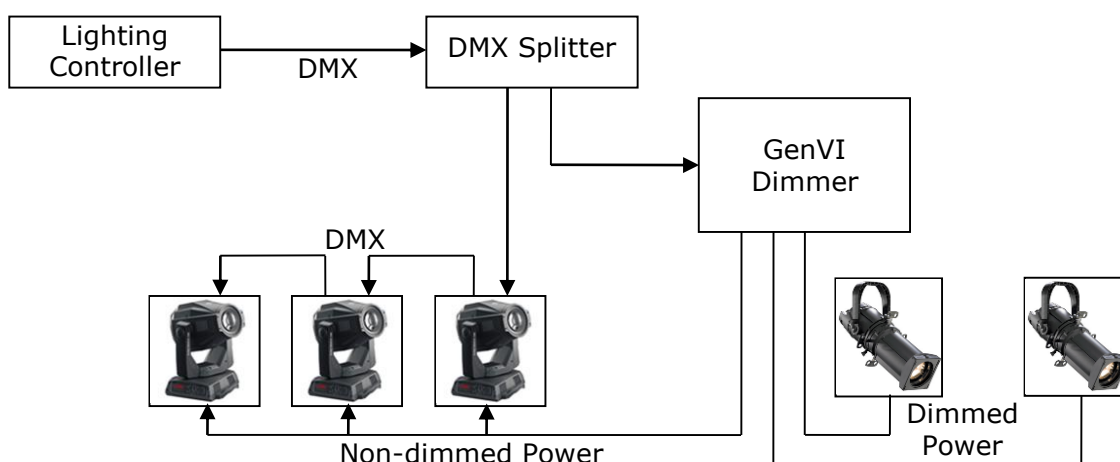
The DMX Loss memory is normally activated automatically when DMX is lost but you can also manually fade the memory in or out using the **Fade In / Fade Out** button.



3.8.4 Auto Power

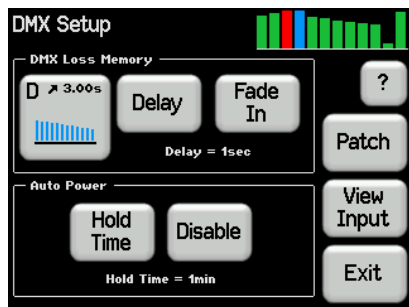
Many lighting fixtures such as LED’s and moving fixtures require a constant source of non-dimmed power when they are operating. Normally you would manually switch on the power to these devices prior to a show and manually switch them off at the conclusion. Auto Power is a feature that automatically switches selected GenVI channels to full ON whenever there is a DMX signal present on the input to the GenVI 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 GenVI channel that is configured for “NonDim” and “Auto Power”. The 2 conventional fixtures are connected to GenVI channels configured for either “S Curve” or “L Curve” dimming outputs. When the lighting controller is switched on, the GenVI detects the DMX signal and automatically switches on the power to the moving fixtures.



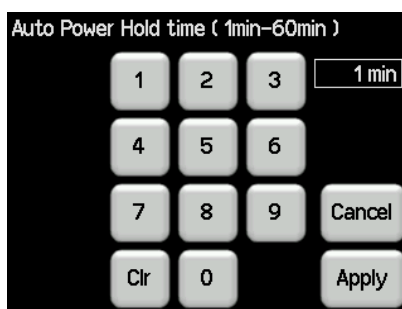
Note: To make a channel switch On when DMX is present you must “Enable” Auto Power as described below and also select “Non Dim” as the channel’s “Curve” and “Auto Power” as the channel’s “Control Source”. See section 3.7 for details.

To enable “Auto Power” select the DMX Setup menu by pressing **Config, DMX**.



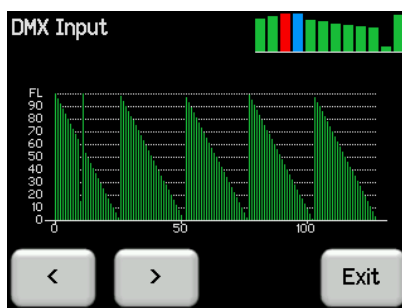
The “Auto Power” pane has 2 buttons:

- 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**.

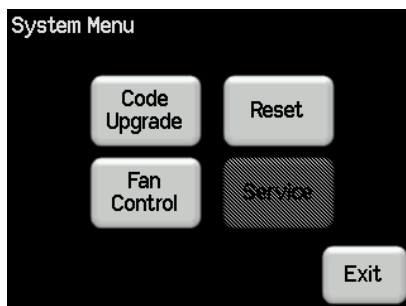


Press either < or > to scroll through all slots in the DMX Universe.

3.9 SYSTEM MENU

Selecting **Config, System** provides menus for the following functions:

- Code Upgrade.
- Reset.
- Fan Control.
- Service. (Factory use only).



3.9.1 Code Upgrade

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

To upgrade your GenVI software, download the latest version from the LSC web site, www.lscighting.com 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.

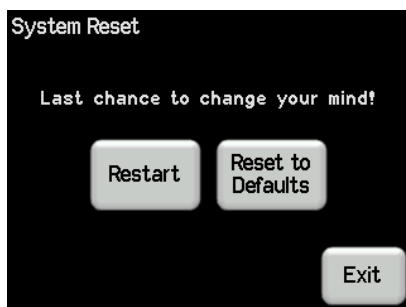
Press **Config, System, Code Upgrade**.



Insert the SD card and follow the onscreen instructions.

3.9.2 Reset

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



3.9.2.1 Restart

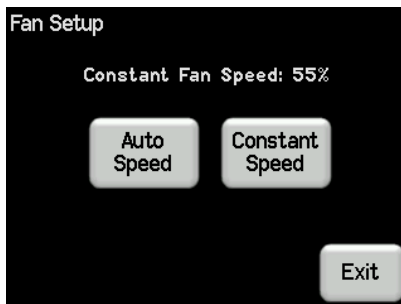
In the unlikely event that the GenVI fails to respond, the operating system may be restarted so that the software may initialise and recommence normal operation. Performing a restart will not affect any of the settings or memory.

3.9.2.2 RESET To Defaults

This will ERASE all memory from the GenVI and reset to defaults.

3.9.3 Fan Control

The internal fan in the GenVI 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 touch screen. The speed range is from 0 to 100%.

3.10 COLOUR THEME MENU

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



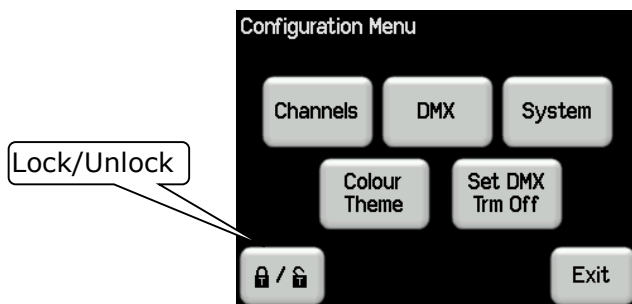
The default colour is "Gothic".

3.11 SET DMX TERM

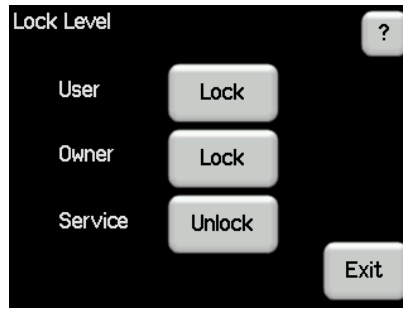
Selecting **Config, Set DMX Term On/Off** switches the internal DMX termination switch On or Off respectively. See section 5 for more details on DMX.

3.12 LOCK / UNLOCK

To **lock** the touch screen of the GenVI and prevent unauthorised access press **Config**.



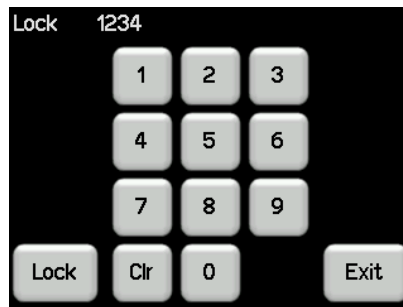
Pressing the "Padlock" symbol provides 3 levels of lock.



- User. Locks out the "Config", "Owner", "Riggers Control" and "DMX Address" menus.
- Owner. Locks out the "Config" and "Owner" menus.
- Service. Locks out the "Service" menu.

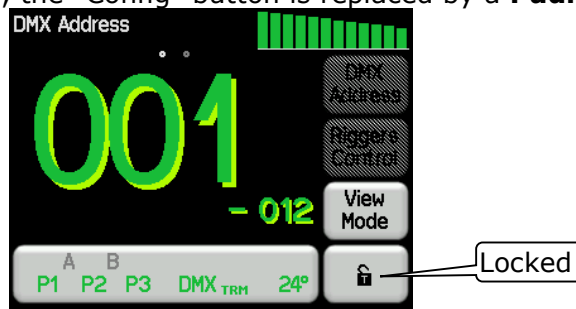
Note: The "Service" menu is used for factory setup and has no user functions. It is always locked.


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 4 digit code.

4 Alarms and Troubleshooting

Warning. No user controls or user serviceable parts are located inside the GenVI Dimmer. Refer all servicing to suitably qualified personnel.

4.1 MAINTENANCE

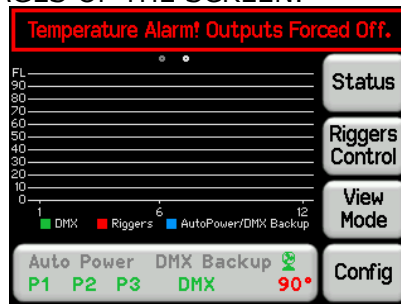
Ensure that the air vents are free from dust.
Check that the GenVI contains the latest software release.

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 GenVI dimmer. See section 3.11
- The GenVI has an internal cooling fan. The fan symbol is displayed when the fan is running. The fan speed can be controlled. See section 3.9.3.
- The internal temperature of the GenVI 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 ALL OUTPUT is automatically switched OFF. A WARNING IS DISPLAYED ON ALL PAGES OF THE SCREEN.

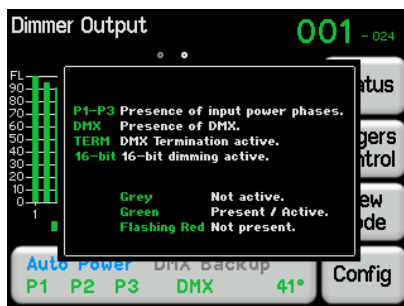


- o Either reduce the load or increase the cooling to reduce the temperature. If the fan has been set to a constant slow speed either increase the speed or set it to "Automatic". See section 3.9.3.

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



Touching 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.

4.3.1 Rigger Test

You can test the operation of a dimmer channel from the "Riggers Control" on the LCD touch screen. See section 3.5

4.3.2 DMX Control

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

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 GenVI dimmer has a "DMX Patch" menu that allows you to patch (connect) each DMX slot (address) from your lighting controller to a GenVI 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.

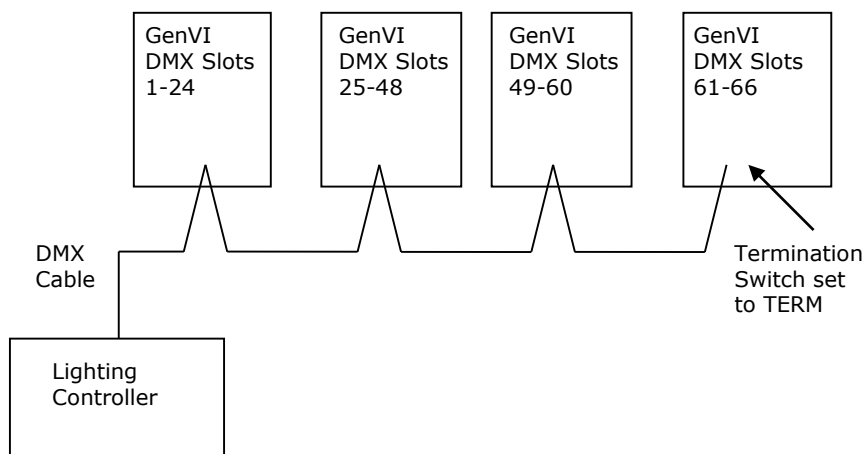
The GenVI uses a high impedance DMX input circuit allowing you to loop the DMX signal from one GenVI to the next. The last GenVI in the chain must have the "DMX Terminate switch" set to TERM to terminate the line.

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 GenVI dimmer. The DMX cable is then looped to the following GenVI dimmers. The order of the daisy chaining is not important as each GenVI 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 GENVI RDM

LSC's GenVI Dimmer range are RDM enabled products. This allows you to use RDM to interrogate the dimmer to find out its status such as:

- Temperature.
- Fan Speed.
- Presence of input power phases 1-3.

The GenVI 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 GenVI 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?

PTFD 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 GenVI dimmers are PTFD dimmers.

8 Specifications

Power Input	Nominal: 220-240 Volts. 3-phase star (380-415V). 50-60Hz (Single phase operation possible. See section 2.3.1) Operating range : Typically 190-260V, 45-65Hz 3-phase delta connection is available as a factory fitted option.
Control Inputs	DMX512 (1990) or DMX512-A (E1-11) and RDM (E1-20) via 5 pin XLR.
Outputs	Several types of output connections can be ordered: <ul style="list-style-type: none"> • Australian 3 pin sockets. • Powercon sockets. • Shuko sockets. • Harting 16 sockets. • Socapex. • Screw terminals.
Load Output per Channel	10A or 13A <u>maximum</u> load per channel with each channel protected by a RCBO (Residual Current Breaker with Overcurrent). LSC's proprietary Current Control Technology © (CCT) protects all RCBO's from nuisance tripping due to cold lamp inrush currents.
Duty Cycle	Rated at 100% across all channels simultaneously at 25°C ambient.
Construction	19 inch rack mounting. 3 RU (Rack Units) high.
Dimensions and weights	Dimensions: 69 x 43 x 12cm Box dimensions: 70 x 45 x 15cm Packed weight: 15kgs

9 Compliance Statements

9.1 CE COMPLIANCE STATEMENT

The GenVI Dimmer from LSC Lighting Systems (Aust) Pty. Ltd. has been designed and tested to the European Committee for Electrotechnical Standardization (CENELEC) standard- EN55022 (Information Technology Equipment).

9.2 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.