Redback LDT Dimmer

(Led Drive Technology)

INSTALLATION and OPERATION

Version V 1.1

Covering software Version 2.02
April 2015
Document number: LDT-T01U-A2

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Contents

Conventions Used in this Manual

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

- A word in [**Bold**] text represents a button
- Emphasis is indicated by underlining.
- *Notes or Hints are displayed in italic font*

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1 Product Description

1.1 ABOUT THIS MANUAL

This manual describes the installation, configuration and operation of the LDT dimmer (LED Drive Technology) range of digital LED dimmers manufactured by LSC Lighting Systems.
The LCD screen of the dimmer has four different colour themes that you can select. The screen images in this manual use the default "" colour theme.

1.2 LDT DIMMER OVERVIEW

LDT is a new technology dimmer that allows control of dimmable retrofit style LED fixtures. With the global move to LED technology, many users simply replace existing fixtures with their LED equivalent only to find that they can't dim them since the majority of traditional dimmers will not dim LED fixtures smoothly or reliably. LDT offers the perfect solution to your potential problem.

LDT dimmers are specifically designed to dim LED (Light Emitting Diode) lamps. They can also be used to dim incandescent fixtures or any dimmable load.

Unlike incandescent lamps that use heat to produce light, LED's are electronic devices that produce light when power is applied. When dimmed by conventional dimmers, LED lamps can exhibit undesirable behaviour such as flickering. LDT dimmers use proprietary technology to provide reliable dimming of LED lamps without flickering. LED lamps are not all the same so a simple setup procedure is used to programme the dimmer for the type and quantity of LED lamps that are being dimmed. See section 4.7.5.

Due to the type of electronics used by the manufacture of the LED:

- Some LED lamps cannot be dimmed. Check that the manufacturer of the LED specifies it as "dimmable".
- Some LED lamps cannot be dimmed over the full range. If the LED will dim over the full range then the LDT dimmer will dim it.

LED's also have a different response curve to dimming compared to incandescent lamps. The LDT dimmer uses a linear dim curve to achieve an even and smooth dim response.

The LDT dimmer can be controlled by any DMX512 lighting controller or by optional remote wall plate stations. 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 via the DMX connection.

1.2.1 Features

- DMX512 (1990), DMX512-A (E1-11) and RDM (E1-20) compliant control. If the DMX signal is lost, the LDT dimmer can either hold the last values or fade to a "DMX Loss" memory after a programmable delay.
- Six internal memories with wall plate control.
- Panic mode for evacuation lighting.
- Individual channel settings for:
  - DMX address patching.
  - Minimum and maximum output levels.
  - Fade curve.
  - Lamp type, LED (3 levels) or Tungsten.
- 10 Amp RCD/MCB (Residual Current Device/Miniature Circuit Breaker) protection per channel.
- 100% duty cycle operation across all channels simultaneously.
- Loads are connected via internal terminals.
- Leading edge Triac based dimmer controlled by proprietary technology.
- Variable speed fan cooling. The fan only operates when required.
- CE and C tick approved.

1.2.2 LDT dimmer Control Philosophy

The LDT dimmer is known as an "ARCHI-TAINMENT" dimmer.

- Architectural control of LDT dimmer memories is by remote "wall plate" controls.
- Entertainment control is by DMX from your lighting controller.

The LDT dimmer channels can be *individually configured* to be controlled by either:

1. DMX Only
2. Memory Only
3. Auto Switch
4. Auto Power

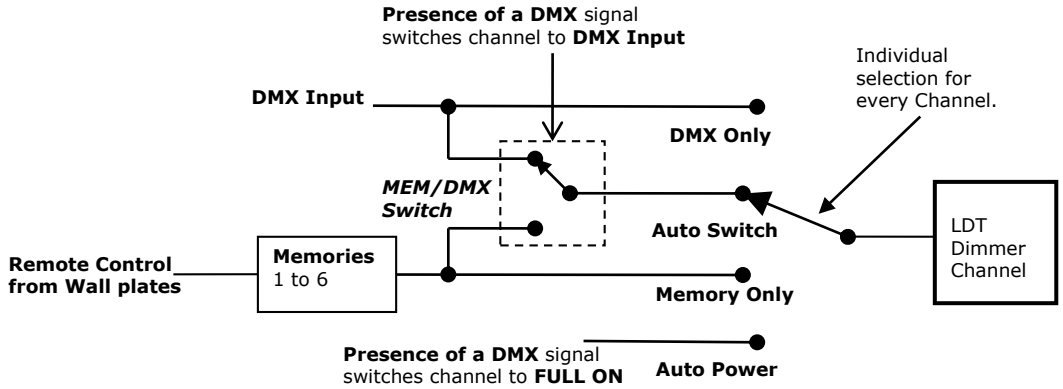
1. DMX Only. When configured for "DMX Only", a channel is controlled from a DMX lighting controller. If DMX fails, the channels can either hold their last state or after a programmable delay time, fade to a "DMX Loss Memory" previously stored in the LDT dimmer.

2. Memory Only. When configured for "Memory Only", a channel is controlled from wall plates that are used to recall memories (6) stored in the LDT dimmer. These memories can also be recalled from the front panel LCD touch screen.

3. Auto Switch. When configured for "Auto Switch" a channel will be *automatically* switched from Memory to DMX control whenever the lighting controller is switched on (and hence a DMX signal is detected on the input to the LDT dimmer).

4. 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 LDT dimmer. 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.

The following diagram shows a simplified version of the control sources that can be chosen for every channel.



1.3 MODELS

The LDT dimmer range of dimmers is designed for permanent installation and is available either 6 or 12 channels.

6 channels

12 channels

1.3.1 Factory Fitted Options

The LDT dimmers can be supplied with the following factory fitted options:

1.3.2 100-120VAC Input Power

LDT dimmer's can be supplied for 100-120VAC input power operation.

1.3.3 3 Phase Delta Input Power

LDT dimmer's can be supplied wired for 3 phase Delta input power operation.

1.4 OPTIONAL CONTROL PANELS

1.4.1 Wallplates

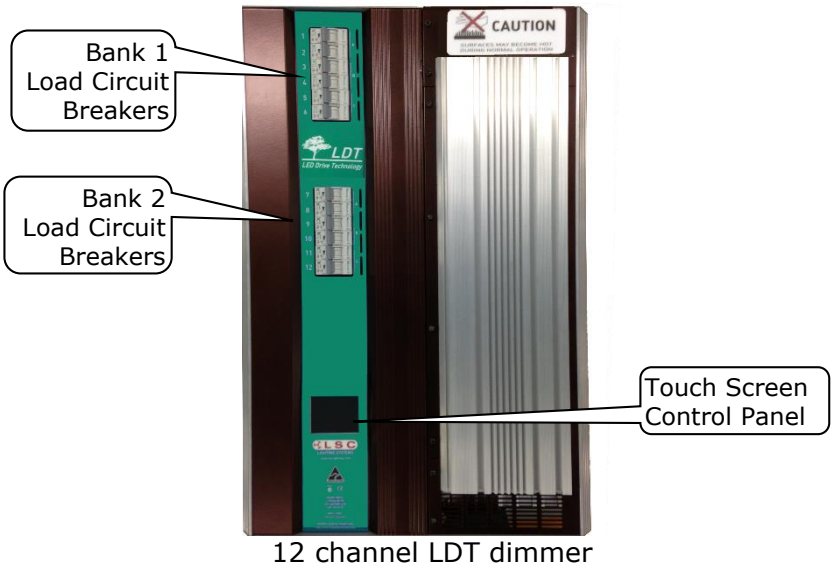
Wall plates are optional remote control switch plates that can be used to control any of the 6 internal memories that are stored in the LDT dimmer. Wall plates are available with either 1, 2 or 6 buttons.

1.4.2 Panic Button

Panic buttons are available to control the "Panic/Evacuation" lighting memory in the LDT dimmer. They use a push button to activate and a key switch to de-activate.

1.5 FRONT PANEL

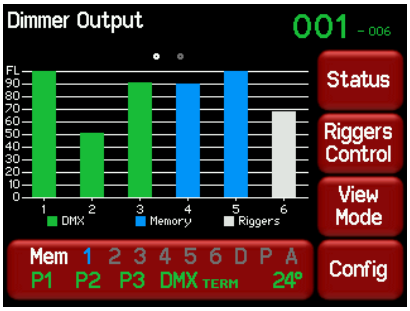
The front panel contains the input RCD (Residual Current Device) breaker (optional), load MCB (Miniature Circuit Breakers), and LCD touch screen.

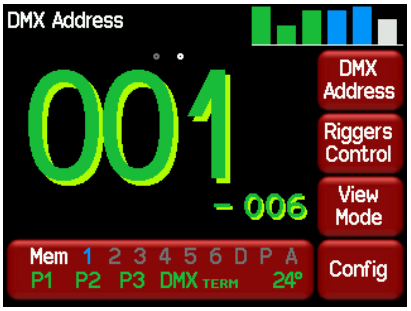


12 channel LDT dimmer

1.6 TOUCH SCREEN CONTROL

The LDT dimmer uses a colour LCD touch screen which is operated by touching the virtual buttons and faders with your finger or a stylus.
There are two home pages available, "Dimmer Output" and "DMX Address". Pressing [**View Mode**] swaps between the two pages.





6 ChannelLDT dimmer

The menu system is described in section 4.

2 Installation

2.1 SAFETY

All electrical work must be carried out by suitably qualified persons.
The LDT dimmer is primarily designed for mounting on a solid flat vertical surface.
The dimmer is heavy. Use the correct lifting procedures when handling the dimmer. The heat sink on the front may become HOT.

2.2 UNPACKING

The LDT 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 THE LDT DIMMER

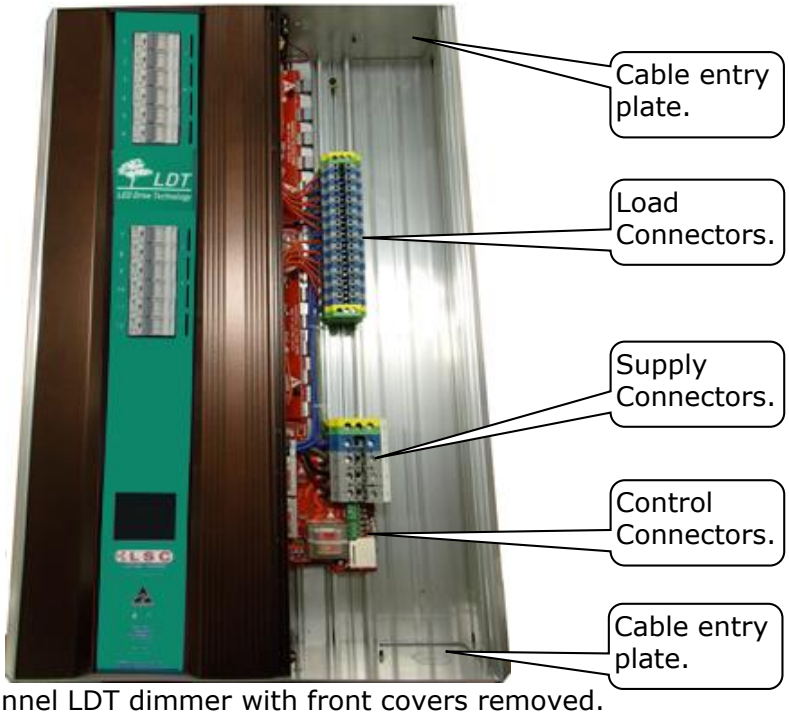
The LDT dimmer is designed for wall mounting and is provided with keyhole cut-outs in 4 locations, two at the top and two at the bottom. A mounting template is provided with unit.

Ensure that the mounting can support the weight. Refer to the specifications at the end of this manual for the weight of your model.

The ventilation holes at the top, bottom and front of the unit must be kept clear. When mounting multiple dimmers, allow a minimum space of 100mm between dimmers and 200mm above and below each dimmer.

2.4 CONNECTIONS

Connections are provided behind the front covers for power input, DMX control, Wallplate control, Panic control and load power. All control circuit wiring should be isolated from the power cabling by a metal conduit run up to the control circuit connectors.



12 channel LDT dimmer with front covers removed.

2.4.1 Input Power Supply

The **LDT dimmer** system must be fed from a suitable external circuit breaker. The current ratings of the supply for each model are listed below.
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 input power connection utilizes five 35mm^2 terminals (3 phases, neutral and earth).
The nominal input voltage is 220-240 Volts. 3-phase Star (380-415V). 50-60Hz.
3 phase Delta is also available as a factory option.

2.4.1.1 6 Channel LDT dimmers

6 Channel LDT dimmers can be powered from:

- Three phase supply of nominal 220-240VAC* at 50 - 60Hz of up to 20 Amps per phase. See Neutral rating note above.
- Single phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 60 Amps

2.4.1.2 12 channel LDT dimmers

12 channel LDT dimmers can be powered from:

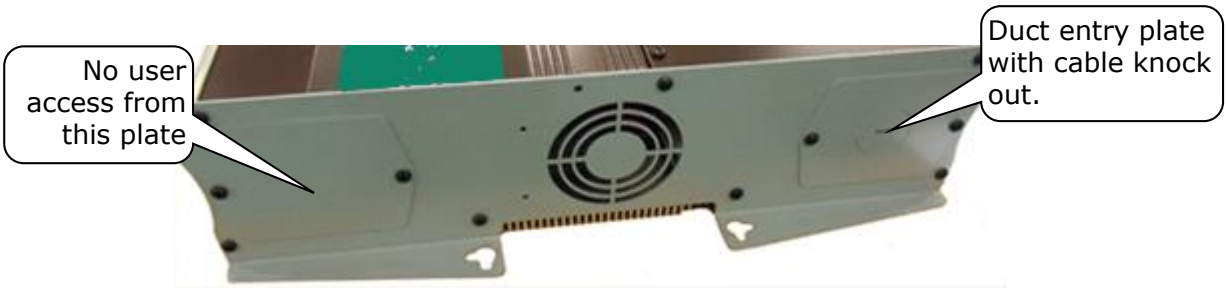
- Three phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 40 Amps per phase. See Neutral rating note above.
- Single phase supply of nominal or 220-240VAC* at 50 - 60Hz of up to 120 Amps.

*100-120VAC versions are available by special order from the factory.

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

2.4.2 Cable Entry

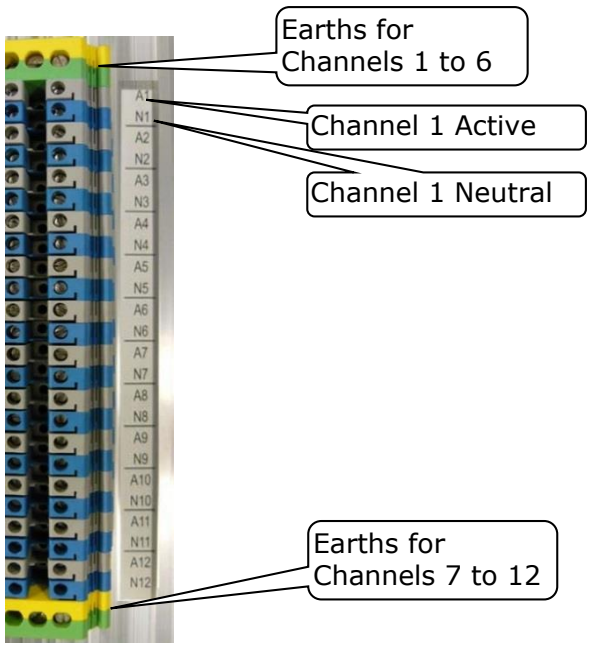
LDT dimmers are fitted with removable cable duct plates on the top right and bottom right of the unit.



The bottom plate is provided with a cable knock-out entry. To remove the knock-out insert a flat blade screwdriver in the slot provided and twist out the metal disk and fit a M32 cable gland.

2.4.3 Connecting the Load Circuits

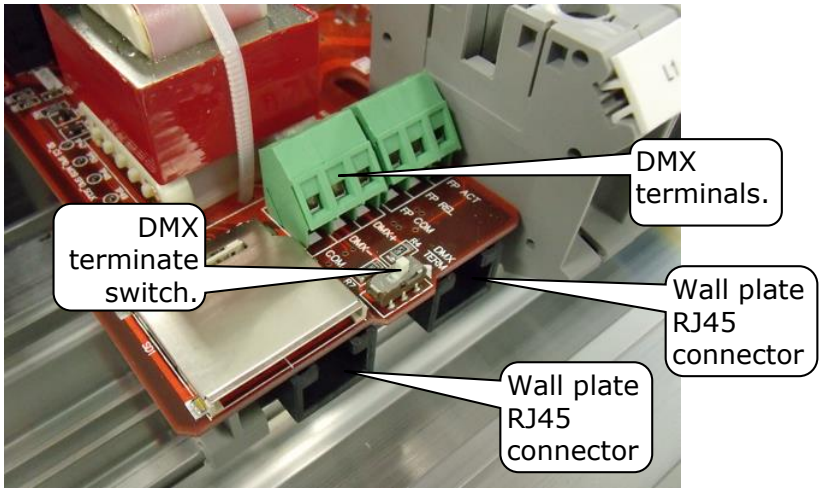
6mm terminals are provided for Active (A) and Neutral (N) for each load circuit. One 16mm Earth (E) terminal is provided for every 6 load connections. These connections are wired directly to the outlets at the required locations in the building. Each channel needs to be configured for the type of load that is connected, either LED's or Tungsten lamps. As a general rule, when using LED lamps, a maximum of 50 LED lamps can be connected to each channel. This may vary with the different types or manufacturer of the LED's. You can mix LED's and Tungsten lamps on the one circuit but it is not the most efficient method of operation. See section 4.7.5 for details on how to select the type of lamp and how to optimise the dimmer for type and quantity of LED lamps that are connected to each channel.



2.4.4 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.
See "DMX Explained and Typical Installations" for more information.

DMX 512 is connected to the LDT dimmer by using the screw terminals inside the unit. The DMX512 connection is high impedance. This allows the DMX512 to be wired in parallel to other dimmers. 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.



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

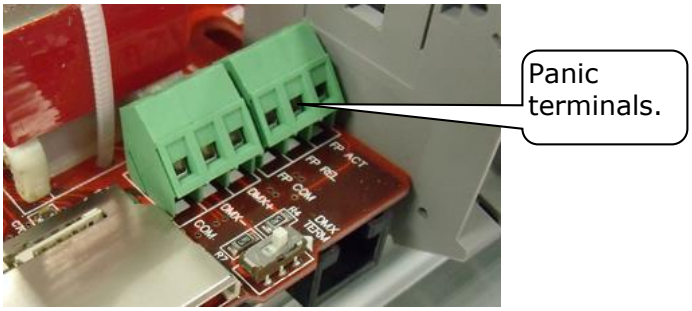
2.4.5 Wall Plate Connection

Wall plates are the remote wall switches for the LDT dimmers. The wall plates allow you to recall any of the 6 internal memories from the LDT dimmer for replay at a pre-programmed level and fade time. Wall plates are available with either 1, 2 or 6 buttons. Wall plates are connected to the LDT dimmer via RJ45 connectors and cat5 cable. Wall plates require all 8

wires in the CAT5 cable to be connected. Two parallel connectors are provided to simplify cable runs to different locations.
See section 5 for details on Wallplate installation and configuration.

2.4.6 Panic Memory Connection

The "Panic" function provides emergency evacuation lighting that can be easily recalled by either a simple "Panic" or "Evacuate" button or it can be connected to a BMS (Building Management System) so that it is automatically operated when a fire alarm is activated.
The "Panic" connection recalls a "Panic Memory" that you have created in the LDT dimmer. This memory will typically contain channel levels that will provide suitable lighting for evacuation purposes.
The Panic (Fire Panel) button function uses two connections, one to activate panic and one for release. Both connections use screw terminals and share the common connection.



The Panic button terminals are labelled:

- FP ACT (Fire Panel Activate)
- FP REL (Fire Panel Release)
- FP COM (Fire Panel Common)

A momentary contact closure between FP ACT and FP COM will activate the Panic memory.
A momentary contact closure between FP REL and FP COM will release the Panic memory.
Specialised "FIRE/Panic" panels are available from LSC or your LSC agent. These use a press button to activate the panic memory and a keys-switch to de-activate the memory.
See section 4.10 for details on how to program the "Panic" memory.

3 Configuring the LDT Dimmer

3.1 OVERVIEW

When a LDT dimmer is installed, it needs to be configured to suit its particular installation, application and type of load (Lamp Type), LED or Tungsten. This involves the following operations which are achieved via the touch screen menus. The menu system is fully described in the next section.

3.2 LAMP TYPE

Each dimmer channel must be configured for the type of lamp that is connected to it. You can choose either "Tungsten" or "LED". If you choose "LED" there are three "levels" from which to choose to give satisfactory dimming (without flickering). This menu item is protected by a service level "Lock Code" to prevent unauthorised use.
See section 4.7.5. for details including how to un-lock the service menu.

3.3 CONTROL SOURCE

Each channel needs to be configured for the "Control Source" that will control it. This could be either "DMX Only", "Memory Only", "Auto SWITCH" (switch from Memory to DMX control whenever the lighting controller is switched on and hence a DMX signal is detected on the input to the LDT dimmer) or "Auto Power" (switch to full ON whenever the lighting controller is switched on and hence a DMX signal is detected on the input to the LDT dimmer). See section 1.2.2 for more information on these choices.
The default setting is for channels to "Auto Switch".
See Control Source in section 4.7.

3.4 PATCHING

Channels set to DMX or Auto Switch Mode, may need to be patched to the DMX slot number that is to control them.
See DMX Patching in section 4.9.

3.5 RECORDING MEMORIES

Channels set to Memory Only or Auto Switch are controlled by the (6) memories in each LDT dimmer. These memories must be created and saved in the LDT dimmer. You can create memories by setting channel levels on the touch screen or by taking a snapshot of the DMX input or the current output of the LDT dimmer.
See Recording Memories in section 4.7.
Memories can be recalled either from the touch screen or via remote "Wall Plates". The Wall plates must also be connected and configured to control the required memories.
See section 2.4.5 and section 5.

3.6 OPTIONAL SETTINGS

In addition to these settings you can also set the following *optional* parameters;

- Create a "DMX Loss Memory" that can be automatically recalled if the DMX signal is lost. See section 4.9.2
- Create a "Panic Memory" that will be recalled when the remote "Panic" button is pressed. See section 4.10
- Set minimum and maximum levels for each channel.
  See section 4.7
- Set the curve of each dimmer channel to either "S Curve", "L Curve" (Linear) or "Non Dim" (switch between OFF or fully ON). See section 4.7.3
- Set a "lock code" to prevent unauthorised access to the menu system. See section 4.13

4 Menu System

4.1 OVERVIEW

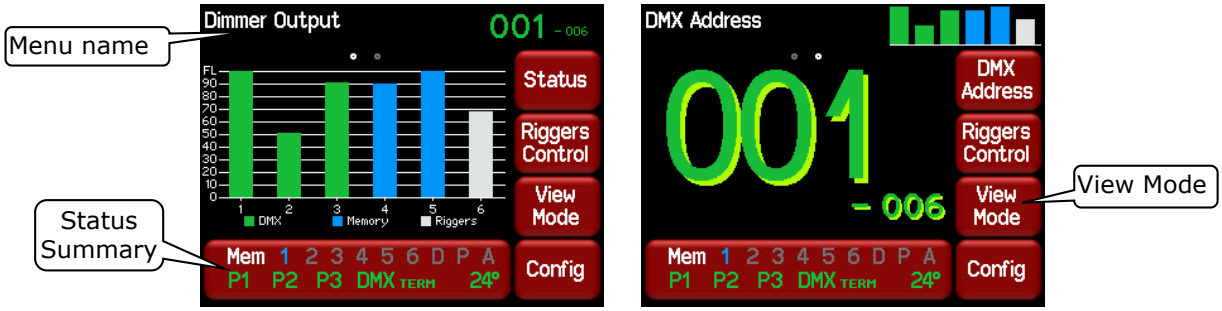
The LDT dimmer uses a colour LCD touch screen which is operated by touching the virtual buttons or faders with your finger or a stylus. The menus on the screen provide the functions to configure and operate the dimmer.

4.2 HELP SCREENS

Many menus have Help screens available. Press the [**?**] button to see the help screen. Touch anywhere within the help screen to cancel.

4.3 HOME PAGES

There are two home pages available, "Dimmer Output" and "DMX Address". Pressing [**View Mode**] swaps between the two pages.



- The "Dimmer Output" home page shows the current output of the LDT dimmer.
- The "DMX Address" home page shows the DMX address.

Both home pages are described in detail later in this section.

Both home pages have two common buttons at the bottom of the screen, the large "Status Summary" button and the "Config" button beside it.

4.3.1 Config

Pressing [**Config**] allows you to access a range of functions and setups via sub-menus. Each sub-menu screen has it name in the top left corner. The menus are fully described later in this section. If the LDT dimmer has been "locked", the [**Config**] button is replaced by the  button. Touching the  button and entering your code number unlocks the LDT dimmer and reveals the [**Config**] button.

4.3.2 Status Summary

The information on the "Status Summary" button 

shows a summary of the status of the LDT dimmer memories, input power, DMX and temperature. Pressing this button shows the legend for these numbers and names. Touching anywhere within the legend screen returns to the Status button.

The top line indicates which memories are active on the output. **Blue** is active. **Grey** is not active.

- **1 to 6** are the six internal (wall plate) memories.
- **D** is the "**D**MX loss" memory.
- **P** is the "**P**anic button" memory.

- **A** shows the status of the "**A**uto on" (when DMX is present) function.

Green is active. **Grey** is not active (DMX not present) and the "A" is not shown when "Auto on" has been disabled.

The bottom line indicates:

- **P1**, **P2**, **P3** show the presence of each input power phase. Green is power present. Flashing **Red** is not present.

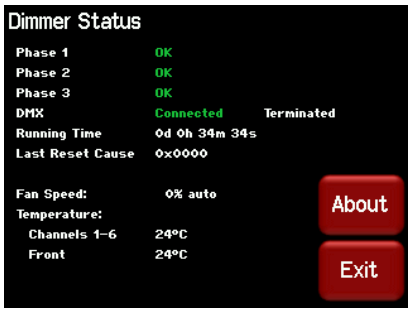
- **DMX** shows the presence of a DMX control signal. Flashing **Red** is not present.

- **TRM** indicates that the DMX line is terminated by the internal "DMX TERM" switch.

- The internal temperature of the LDT dimmer is shown in degrees Celsius. A fan symbol appears if the automatic fan is running. If the temperature exceeds 65C the display flashes red. If the temperature exceeds 72C all output is automatically shut off until the temperature drops below 66C.

4.3.3 Status

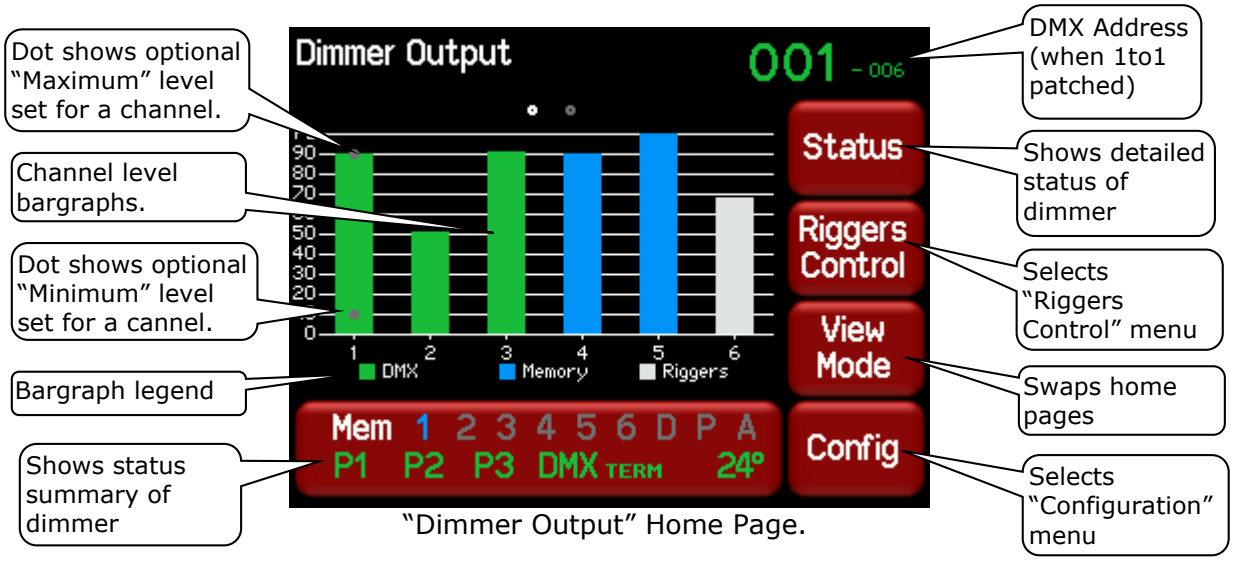
Pressing the **[Status]** button reveals the detailed "Dimmer Status".



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 and the individual temperatures of the internal modules of the LDT dimmer. Pressing [**About**] shows the software versions.

4.4 DIMMER OUTPUT HOME PAGE

The "Dimmer Output" home page shows current level of each channel in a bar graph display which is colour coded to show the current **control source** for each channel.



"Dimmer Output" Home Page.

The bargraph shows the output level of every channel. Channels can be controlled from multiple sources and the colour code of the bargraph indicates the source of the control signal.

- **Green** = controlled by DMX
- **Blue** = controlled by a Memory.

- **Grey** = controlled locally by either the Riggers Control or a "minimum level" channel setting if DMX is not present.

In the above example, channels 1, 2 and 3 are controlled by a DMX. Channels 4 and 5 are controlled by a memory and the large status button shows you that it is Memory 1 (it is blue).

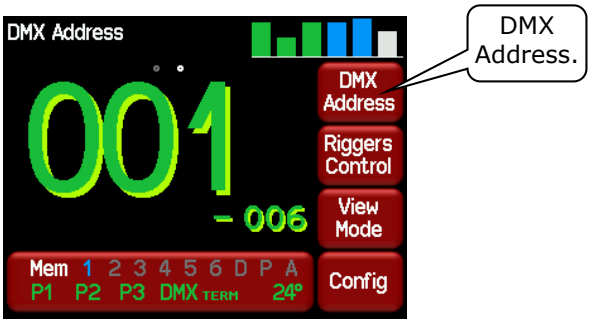
Channels are controlled on a HTP (highest Takes Precedence) basis. If multiple sources are controlling a channel (such as DMX and Riggers control) then the highest level will be output and will hence determine the colour of the bargarph. If a minimum or maximum level has been set for a channel they are indicated by dots on the channels bargraph.

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

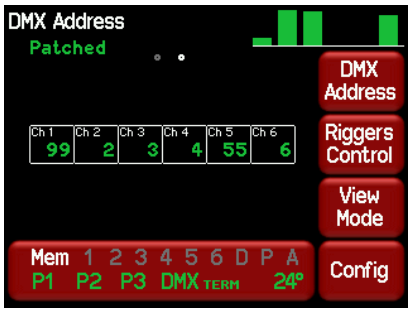
- If a 1 to 1 patch is implemented it shows the DMX addresses of the first and last channels of the dimmer rack.
- If channels are individually patched it shows the word "Patched". Selecting the "DMX Address" home page shows all of the channel patches.

Pressing [**Riggers Control**] allows you to control LDT dimmer channels directly from the touch screen as described below.

Pressing **[View Mode]** swaps the home page to "DMX Address". There are two versions of this page depending upon whether the dimmer has a sequential (1 to 1) patch or channels are individually patched:



1 to 1 patch

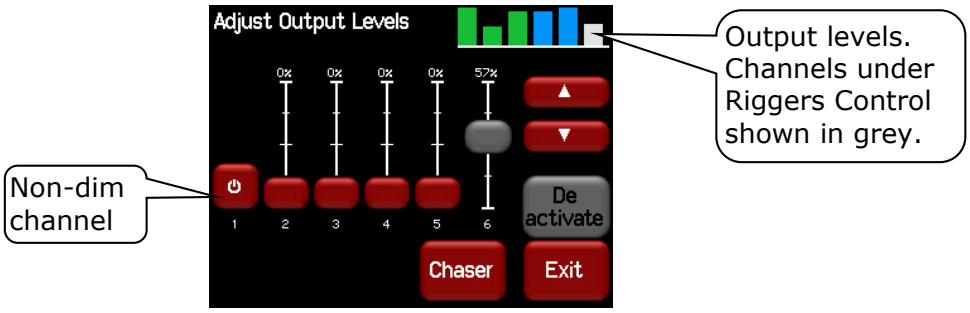


Individually patched channels

The "DMX Address" home page gives access to the [**DMX Address**] menu described below.

4.4.1 Riggers Control

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

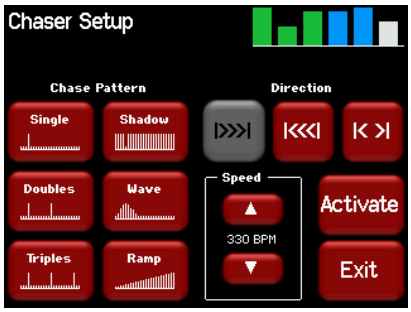


The output of the Riggers Controls can be turned off or on by pressing [**De activate**]/[**Activate**].
To set the level of a channel(s), use the virtual faders. "Non-dim" channels have an On/Off push button switch instead of a fader. The button turns green when it is on.

Press [‹] or [›] to select more channels (if fitted).
When finished press [**Exit**].

4.4.2 Chaser

To activate the chaser, from the "Rigger Control" (above), press [**Chaser**].



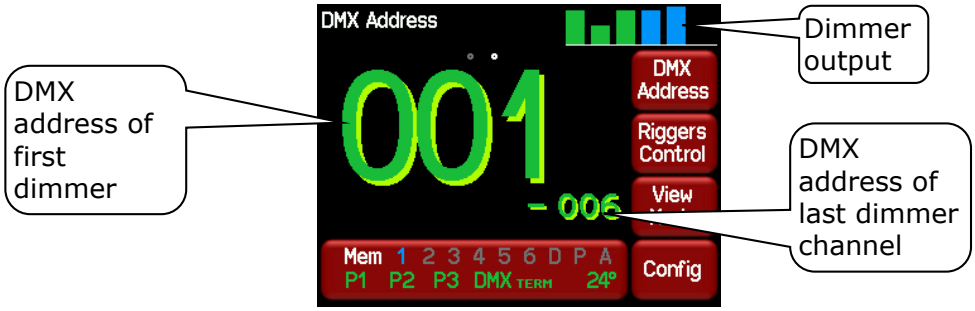
To enable the Chaser press [**Activate**].

- 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 [**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**].

4.5 DMX ADDRESS HOME PAGES

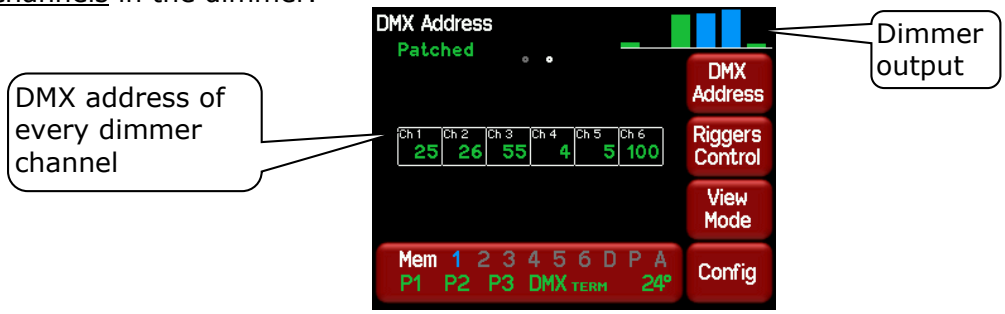
The "DMX Address" home page has two formats:

If a 1 to 1 (sequential) patch is implemented it shows the DMX addresses of the first and last channels of the dimmer (in a large and small font respectively).



1 to 1 Patch

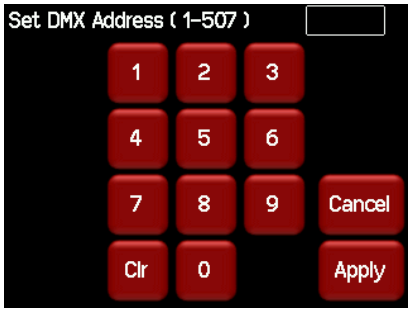
If channels are individually patched it shows the word "Patched" and the DMX addresses of all channels in the dimmer.



Channels individually patched

4.5.1 1 to 1 Patch

Patches are often performed in contiguous blocks of addresses. The dimmer provides a rapid method of patching all of the dimmers in one LDT dimmer rack to sequential DMX slots, starting from a DMX address that you enter.
To perform a 1 to 1 patch, select the "DMX Address" home page (above) then press **[DMX Address]**.

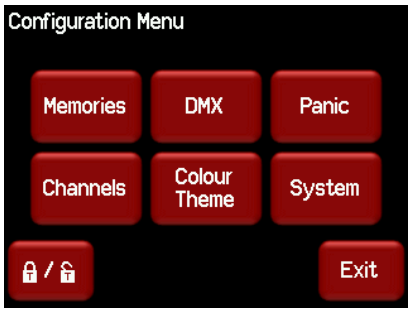


Enter the DMX address for the first channel in this LDT dimmer then press [**Apply**]. The first dimmer channel is patched to the address that you enter and all of the other channels in the dimmer are patched in order to the following addresses.

Individual channel patching is performed in the DMX menu as described in section 4.9.1.

4.6 CONFIG MENU

From either of the "Home Pages", pressing [**Config**] reveals the "Configuration Menu".



The buttons on the "Configuration Menu" provide access to the Sub-Menus and functions which are described in detail on the following pages. Each sub menu has its name at the top of its screen.

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

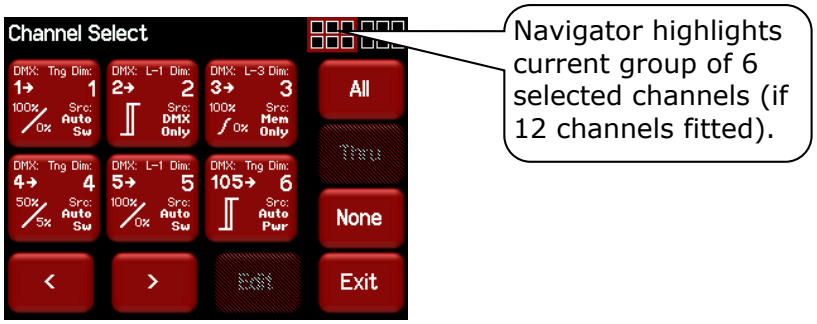
Memories	**DMX**	**Panic**
Edit Wallplate Memories 1-6	Patch	Edit Panic Memory
Fade In or Fade Out (of the selected memory)	View DMX Input levels	Fade In or Fade Out (of the Panic memory)
	Edit DMX Loss Memory & Delay Time Fade In or Fade Out (of the DMX Loss memory)	
	Enable Auto Power Auto Power Hold Time	
Channels	**Colour Theme**	**System**
Min Level	Antarctic	Wallplate Setup
Max Level	Dawn	Code Upgrade
Curve	Redback	Import/Export
Source	Gothic	Reset
Lamp type		Fan Speed

Config Menu Structure

4.7 CHANNELS MENU

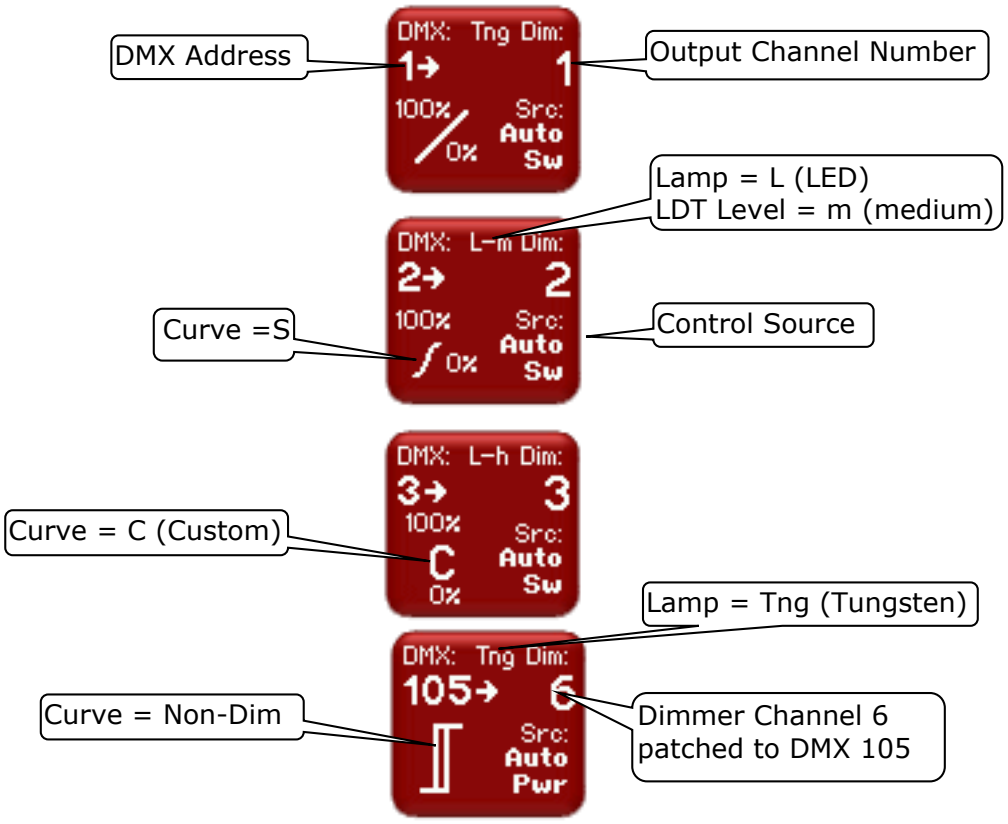
Selecting [**Config**] [**Channels**] provides menus for configuring the following parameters for each channel:

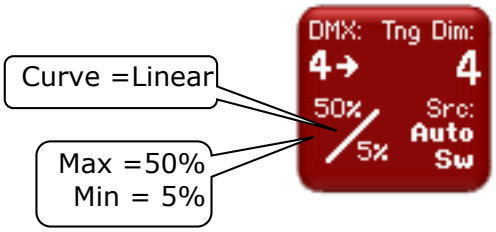
- **Min**. Minimum Level (0-100%).
- **Max**. Maximum Level (0-100%).
- **Curve**. The choices are: S curve (default), L (Linear) curve, Non Dim or Custom curve.
- **Source**. The control source for the channel. The choices are: DMX only, Memory only, Auto Switch (between Memory and DMX whenever DMX is present) or Auto Power (On at full whenever DMX is present).
- **Lamp Type**. The type of load connected to the channel. The choices are: Tungsten, LED l (low) (Level 1), LED m (medium) (Level 2) or LED h (high) (Level 3). The different LED levels are provided to allow for the different characteristics of LED lamps. Their selection is described below in section 4.7.5.



12 channel LDT dimmer

The screen shows the settings for the first 6 channels. Use the [**<**] or [**>**] buttons to see the other groups of 6 channels (if fitted). The navigator in the top right of the screen shows the selected group highlighted by a red border.
Each channel button shows the settings for that channel.





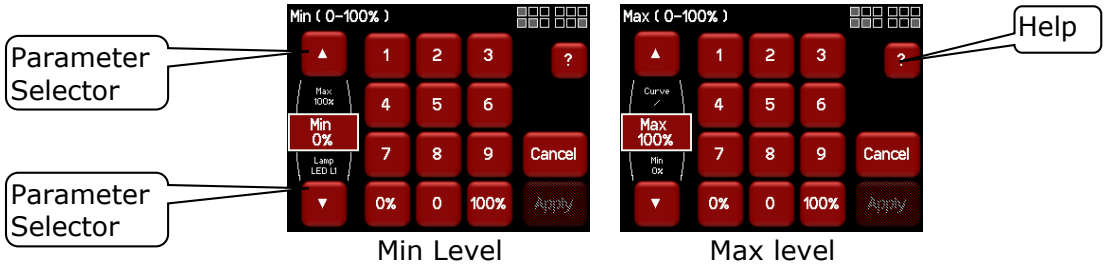
To change the settings of a channel(s), select the channel(s) by touching (it turns grey). You can select multiple channels. To select a range of channels select your first channel then press [**Thru**] then your last channel. Use the [**<**] or [**>**] buttons to see the other groups of 6 channels (if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

The selected channels are highlighted in grey in the navigator:

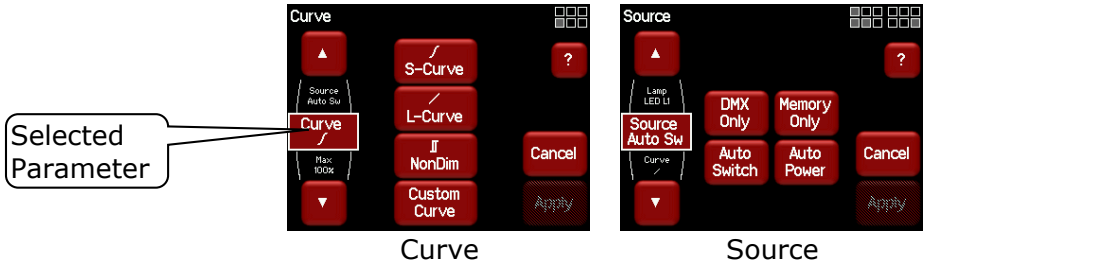
In this example channels 1, 4, 5 and channel 12 are selected.

When you have selected your channel(s) press [**Edit**].
There are 5 possible parameter menus: Min Level, Max level, Curve, Source and Lamp Type. Use the [▲] and [▼] "Parameter Selector" buttons to scroll through the parameter settings for the selected channel(s).

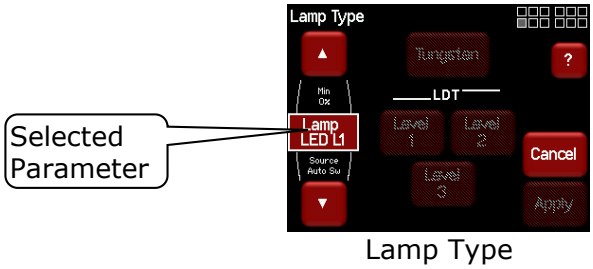
On screen "Help" is available for each parameter.



Min Level Max level



Curve Source



Lamp Type

The "Lamp Type" menu is usually locked out (greyed out) because it is only used when the dimmer is commissioned or if the loads are changed. It can be enabled by unlocking the "Service Menu". See section 4.7.5

Each parameter setting is described in section below.

4.7.1 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" tungsten lamp filaments.

4.7.2 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 tungsten lamp as it never operates on full voltage or setting it to 50% provides 115volt output

4.7.3 Curve

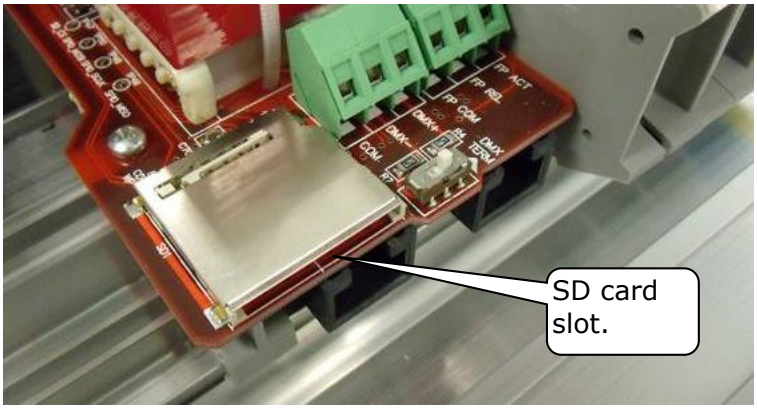
Fade Curve is the curve or "transfer characteristic" between input control signal and dimmer output. The following curves are available;

- **S curve** provides a normal response between the control signal input and the lamp output. S curve is the best curve for dimming LED's and is automatically selected when the "Lamp type" menu is set to any of the "LED" settings however you can change the curve if required.

- **L curve** provides a linear response with more output at the lower end. L curve is the best curve for dimming tungsten lamps and is automatically selected when the "Lamp type" menu is set to Tungsten however you can change the curve if required.

- **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 the channel will switch OFF when the level drops below 40%. "Non Dim" is used for devices that do not fade, but need to be switched OFF or ON such as motors or discharge lamps. The "Lamp Type", "Min Level" and "Max level" menus are not available when "Non Dim" is selected.

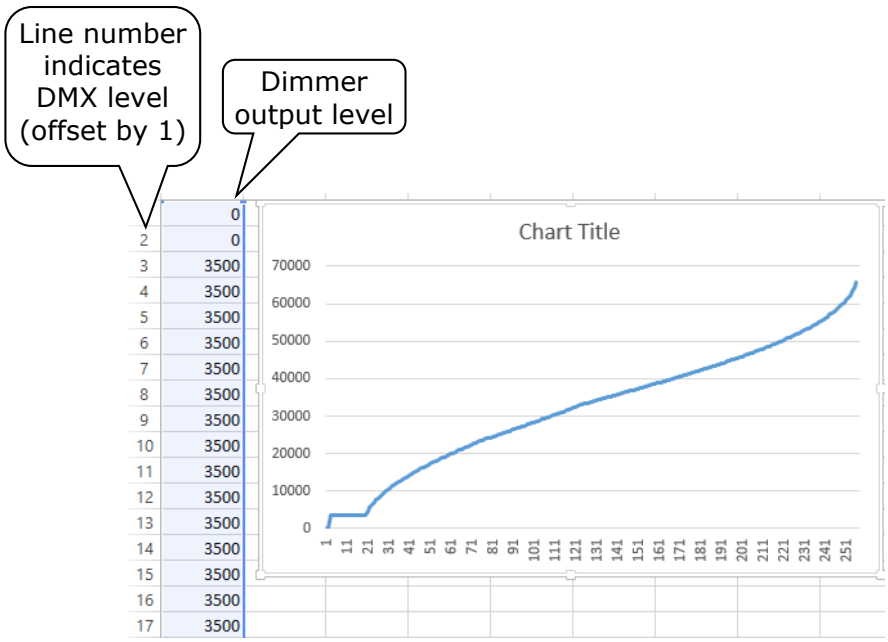
- **Custom curve**. The custom curve is provided for special dimming cases. One LSC custom curve is included with the GenVI dimmer. It is suitable for dimming LEDs. You can export the LSC custom curve to an SD card and modify it to your own requirements. To access the SD card remove the front right panel (beware or the live terminals) and insert an SD card.



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:



1	0
2	0
3	3500
4	3500
5	3500
6	3500
7	3500
8	3500
9	3500
10	3500
11	3500
12	3500
13	3500
14	3500
15	3500
16	3500
17	3500

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 GenVI then select: **Config**, **System**, **Import/Export**, **Import Curve**.

4.7.4 Source

The LDT dimmer 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.

- **Memory only**. When configured for "Memory Only" a channel is controlled from wall plates that are used to recall memories (6) stored in the LDT dimmer. These memories can also be recalled from the LCD touch screen.

- **Auto Switch**. Whenever a valid DMX signal is connected to the LDT dimmer, channels set to "Auto Switch" will be *automatically* switched from Memory control to DMX control. When the DMX signal is lost, they will automatically revert to Memory control.

- **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 LDT dimmer). When "Auto Power" is enabled, channels configured for "Auto Power" will be *automatically* switched ON at full level

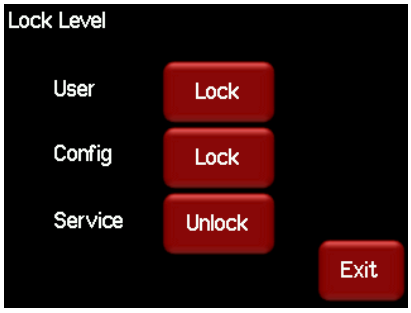
whenever any valid DMX signal is detected. These channels will remain on for a programmable "hold time" when DMX is no longer detected.

4.7.5 Lamp Type

Each dimmer channel must be configured for the type of lamp that is connected to it. The LDT dimmer can dim either LED or Tungsten lamps and you can even have a mixture of both types of lamp connected on the same circuit. However, mixing load types is not the most efficient way of operating the dimmer and LSC recommends that you try to arrange your circuits so that only one type of lamp is connected to each dimmer channel.

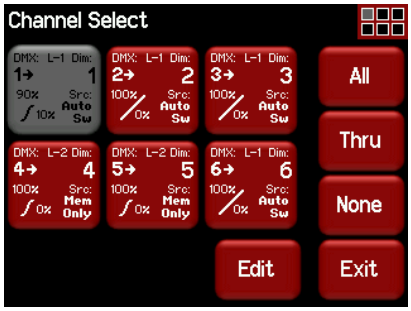
Dimmer channels can be configured for either "Tungsten" or "LED". If you choose "LED" there are three "levels" from which to choose to give satisfactory dimming (without flickering) as described below. If you must mix LED's and tungsten on the same circuit select the "LED" setting and follow the same procedure for selecting the correct "level" as described below.

To enable the "Lamp Type" menu, unlock the "Service" menu. From either "Home" screen press [**Config]**, then select the **Padlock** symbol at the bottom of the "Configuration" menu.

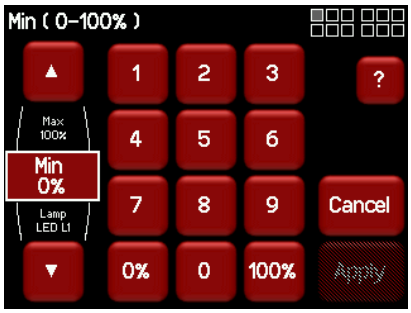


Press the Service level **[Unlock]** and enter the code **3333** then press **[Unlock]**, **[Exit]**.

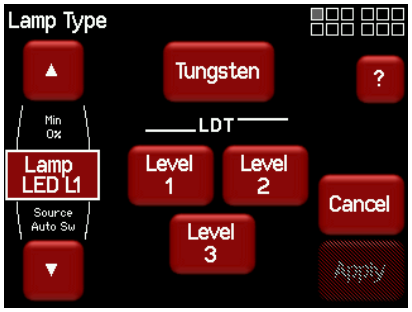
In the "Configuration" menu press **[Channels]**. Select the channel to be configured (it turns grey).



Press **[Edit]**.



Press the down arrow  to select the "Lamp Type" menu.



Select the type of load that is connected to the channel.
For conventional tungsten lamps select **[Tungsten].**
For LED lamps there are three levels of LDT dimmer (Led Drive Technology) from which to choose to obtain satisfactory dimming, **[Level 1]** (Low), **[Level 2]** (Medium) or **[Level 3]** (High). Each level applies a different amount of correction compensation to enable the LEDs to be dimmed without flickering at low intensity levels. Start by selecting **[Level 1]** then dim the LED's over their full range. If the LED's flicker, select **[Level 2]** and again dim the LED's over their full range. If the LED's still flicker, select **[Level 3]**. If the LED's still flicker, reduce the quantity of LED's on the circuit and start again at "Low" level. The recommended maximum quantity of LED's on one circuit is 50.
Always use the lowest "Level" setting that provides satisfactory dimming as this will operate the dimmer at maximum efficiency.
Selecting any of the LED levels also automatically selects the recommended dimmer curve for LED's.
When finished press **[Exit]**.

When the "Lamp Type" has been set, LSC recommends that you re-lock the service menu.
See section 4.13

4.7.6 Default Channel Settings

The default settings for channel parameters are;

ATTRIBUTE	DEFAULT SETTING
Min Level	0%
Max Level	100%
Fade Curve	S Curve
Control Source	Auto Switch
Lamp Type	LED I (low)

4.8 MEMORIES MENU

Selecting [**Config**] [**Memories**] provides menus for editing and activating the dimmer's 6 memories. You can create memories by setting channel levels on the touch screen or by taking a snapshot of the DMX input or current output of the LDT dimmer. The memories are saved in the LDT dimmer and are recalled using the buttons on external wallplates or directly from the LDT dimmer touch screen.

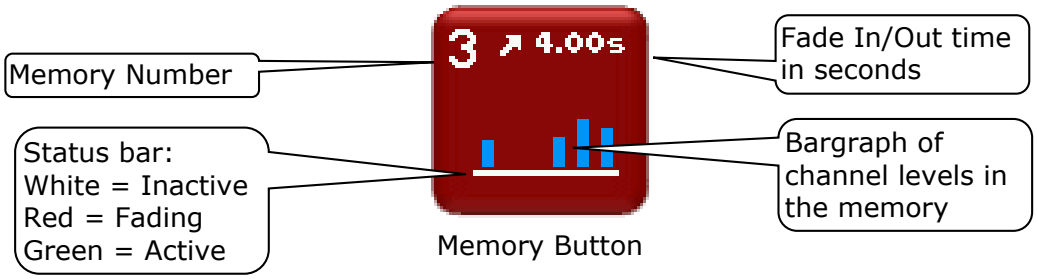
- When a channels "source" is set to "Memory Only", it is always controlled by the LDT dimmer memories.
- When a channels "source" is set to "Auto Switch", it is controlled by the LDT dimmer memories only when there is no DMX signal present at the LDT dimmer.

See section 4.7 for details on how to set a channels "control source".

4.8.1 Create or Edit Memories

To Create or edit a memory, from either home screen press [**Config**], [**Memories**].

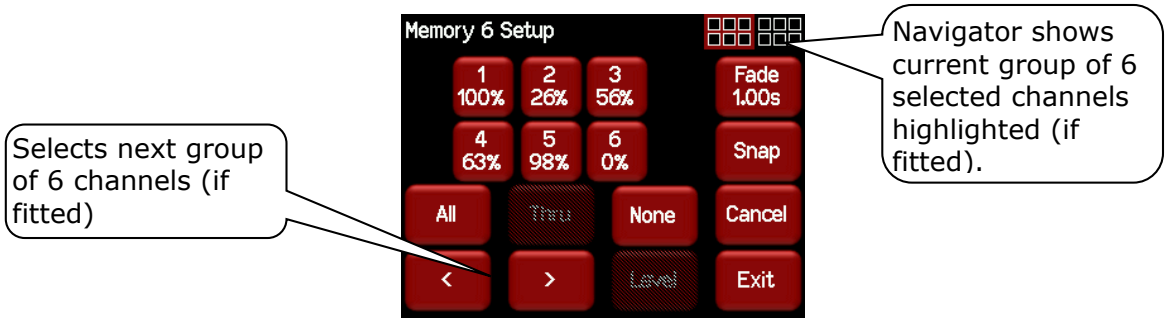
Each memory button shows a bargarph display of the contents of that memory and also its fade time in seconds. The colour of the bar at the bottom of the bargraph shows the status of the memory: White = Inactive, Red = Fading (in or out) and Green = Active.



Touch a memory to select it. The currently selected memory is highlighted in grey.

- Press [**Fade In**]/[**Fade Out**] to see the selected memory on the output of the LDT dimmer.

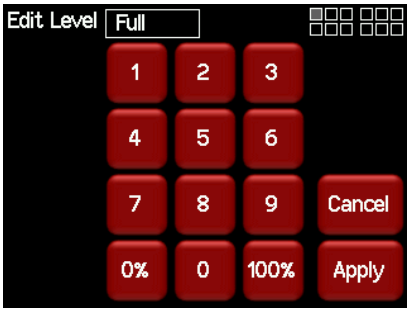
- Press [**Edit**] to edit the selected memory. You can either take a [**Snap**] (snapshot) of the current DMX input signal or the current state of the LDT dimmer's Outputs or select a channel(s) and manually set their levels using the controls on the screen.



12 channel LDT dimmer

4.8.1.1 Manually Setting Channel Levels

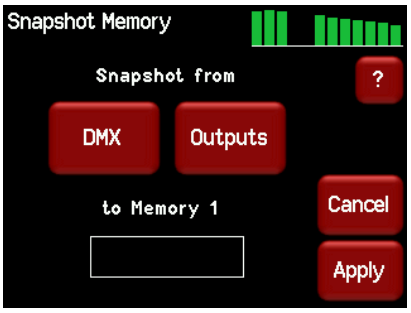
The "Memory Setup" menu (above) shows the first 6 channels. Use the [**<**] or [**>**] buttons to see the other groups of 6 channels (if fitted). The navigator at the top right of the screen shows current group of 6 selected channels highlighted.
Touch a channel to select it (it turns grey). You can 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**].



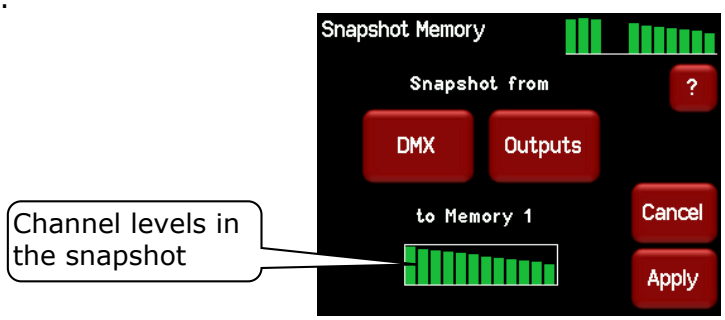
Use the keypad to set the level then press [**Apply**].

4.8.1.2 Taking a Snapshot

To create a memory by taking a snapshot, press [**Snap**] from the "Memory Setup" 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 LDT dimmer. These channel levels could be coming from DMX, Memories, Riggers Control or a combination of all three.
When you take the snap, the channels levels will be displayed in the box below the memory number.

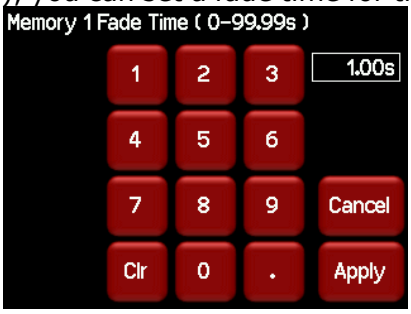


To save the snapshot to the memory press [**Apply**].

The channels levels that were captured in the snapshot can be edited by manually setting channel levels as described above.

4.8.1.3 Fade Time

When editing a memory (above), you can set a fade time for the memory by pressing [**Fade**].



Enter a time in seconds (0 to 99.99) then press [**Apply**].
When all of the channel levels and the fade time of the memory are correct, press [**Exit**].

4.8.2 Playback Memories

To playback a memory either;

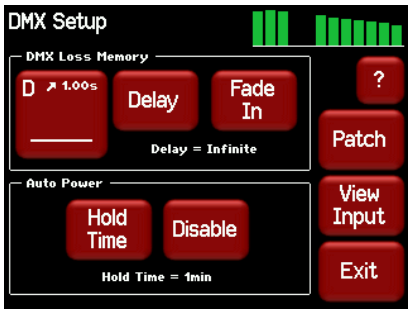
- Press [**Config**] [**Memories**]. Select a memory by touching it (it turns grey), then press [**Fade In**]/[**Fade Out**].
- Use a Wallplate button that has been programmed to control that memory number.

See section 4.12.1 Wallplate Setup for details on how to program Wallplate buttons.

4.9 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.



4.9.1 DMX Patching

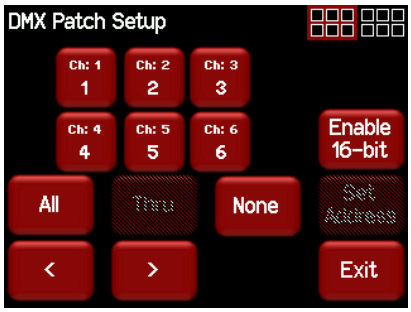
The patch allows you to patch (connect) DMX slots (addresses) from your DMX lighting controller to LDT dimmer channel numbers. Each LDT dimmer unit numbers its channels from channel 1 through to channel 6 or 12, depending upon the quantity of channels in the model of LDT dimmer.

Patches are required when;

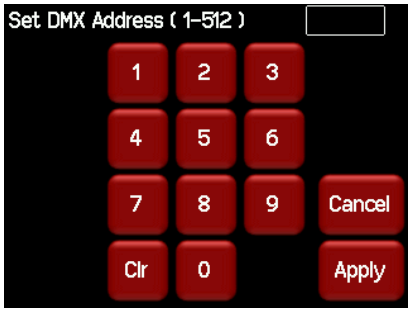
- A particular *DMX slot number* from the lighting controller is to control a LDT dimmer with a different *channel number*.
- A single DMX slot number is to control multiple LDT dimmer channel numbers.

Patches are often performed in contiguous blocks of addresses. The 1 to 1 patch function provides a rapid method of patching all of the dimmers in one LDT dimmer frame to sequential DMX slots, starting from a DMX address that you select. See section 4.5.1

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 (if fitted). Touch a channel to select it (it turns grey). 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

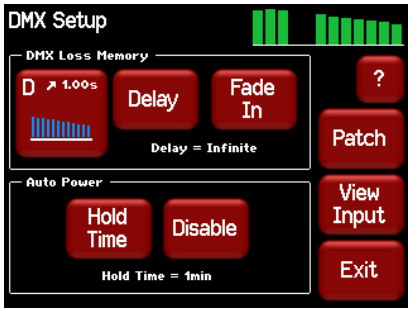
To patch multiple channels to the same DMX slot patch them one at a time.
When finished patching press [**Exit**].

To perform a 1 to 1 patch, from the "DMX Address" home page press [**1 to 1 Patch**], enter the starting address for the LDT dimmer then press [**Apply**].

4.9.2 DMX Loss Memory

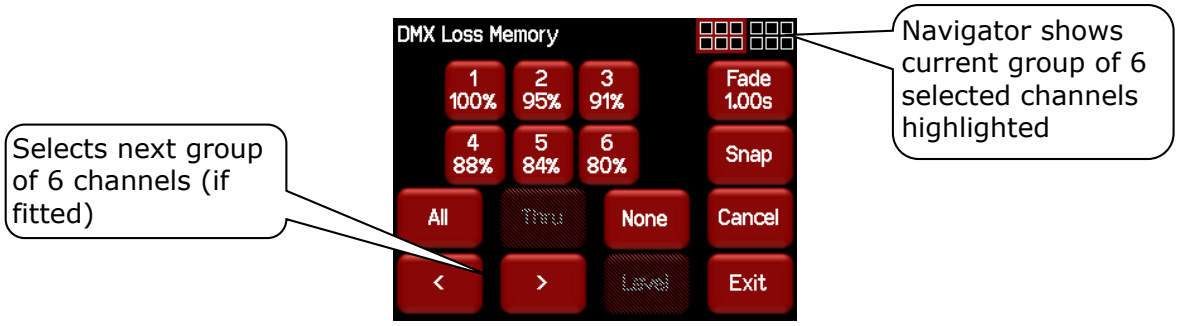
The LDT dimmer has a "DMX Loss Memory" that you can program. In the event that the DMX input signal is lost, channels set to DMX control will hold their last DMX level for a programmable "Delay" time. The default setting for this time is "Infinite". If you set a delay time other than "Infinite", the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

To create or edit a "DMX Loss" memory press [**Config**] [**DMX**].



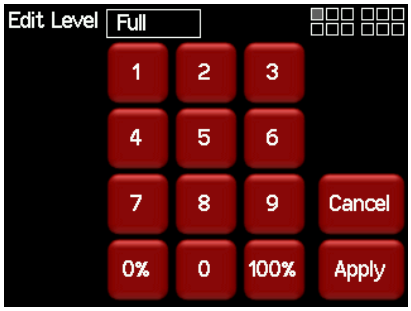
The "DMX Loss Memory" box has 3 buttons:
- Press [**D**] to create or edit the memory as described below.
- Press [**Delay**] to set the "Delay" time as described above.
- Press [**Fade In**]/[**Fade Out**] to see the DMX Loss memory on the output.

The "D" button shows a bargarph display of the current DMX Loss memory and also its fade time in seconds. When you press [**D**], you can either take a [**Snap**] (snapshot) of the current DMX input signal or the current state of the LDT dimmer's Outputs or select a channel(s) and manually set their levels using the controls on the screen.



4.9.2.1 Manually Setting Channel Levels

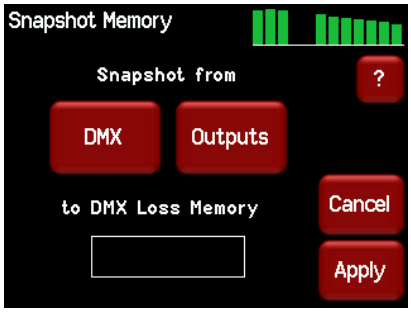
The "DMX Loss Memory" menu (above) shows the first 6 channels. Use the [**<**] or [**>**] buttons to see the other groups of 6 channels (if fitted). The navigator at the top right of the screen shows current group of 6 selected channels highlighted.
Touch a channel to select it (it turns grey). You can 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**].



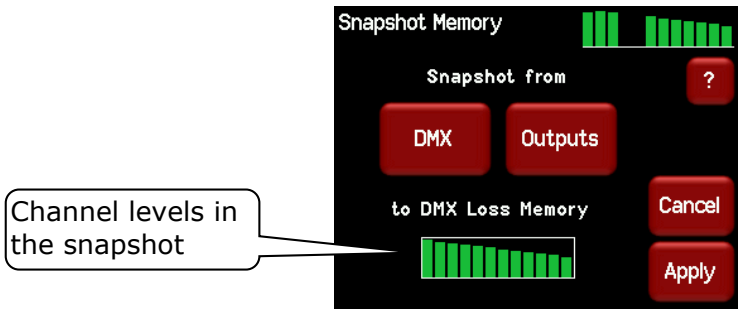
Use the keypad to set the level then press [**Apply**].

4.9.2.2 Taking a Snapshot

To create a memory by taking a snapshot, press [**Snap**] from the "DMX Loss Memory" menu above.



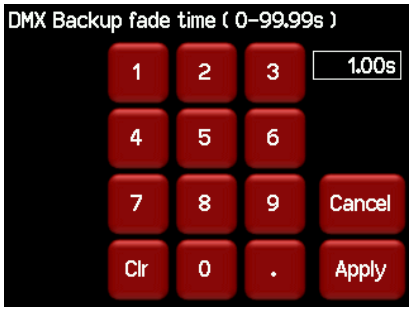
Pressing [**DMX**] will take a snapshot of the current DMX input signal.
Pressing [**Outputs**] will take a snapshot of the current output of the LDT dimmer. These channel levels could be coming from DMX, Memories, Riggers Control or a combination of all three.
When you take the snap, the channels levels 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.

4.9.2.3 Fade Time

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



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

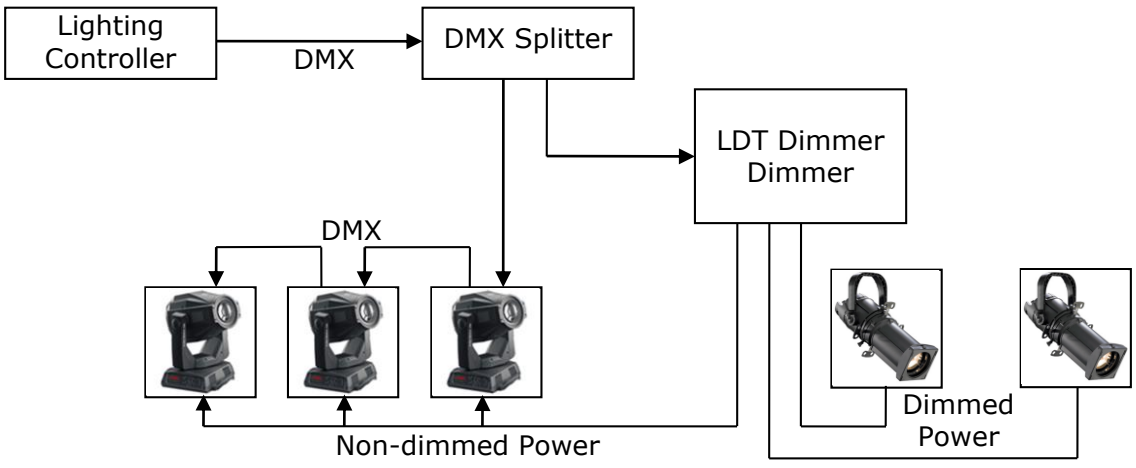
4.9.3 Auto Power

Many lighting fixtures such as LED's and moving fixtures require a constant source of 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 LDT dimmer channels to full ON whenever there is a DMX signal present on the input to the LDT dimmer and switches them OFF when the lighting controller is turned off.

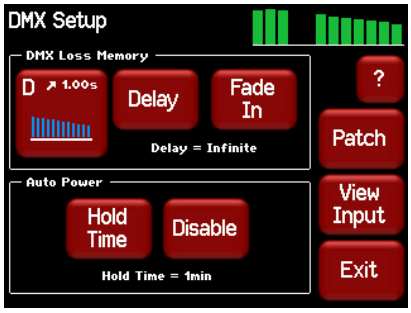
Note: Some electronic equipment might not behave correctly when power is provided by a dimmer circuit. When switched power is required, LSC recommends using one of our dimmer products that provides the "Tru-Power" feature where all of the dimmer electronics are bypassed when switching power to devices.

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. The 2 conventional fixtures are connected to LDT dimmer outputs. When the lighting controller is switched on, the LDT dimmer detects the DMX signal and automatically switches on the moving fixtures.

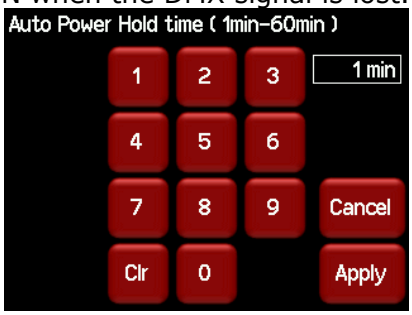


Note: To make a channel switch On when DMX is present you must "Enable" Auto Power as described below and also select "Auto Power" as the channel's "Control Source". This is selected in the "Control Source" section of the "Channels" menu. See the "Channels Menu" below for details.
To select the DMX Setup menu, press [**Config**] [**DMX**].



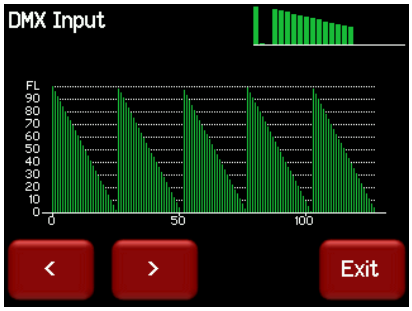
The "Auto Power" box has 2 buttons:

- 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.



4.9.4 View Input

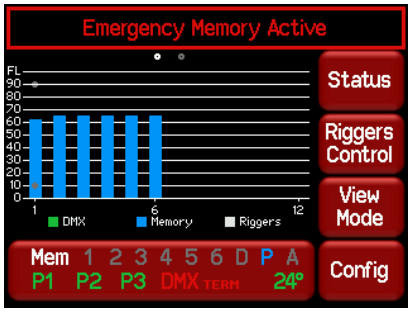
The "DMX Setup" menu allows you to view the channel levels on the DMX input. Press [**View Input**]



Press either [**>**] or [**>**] to scroll through all slots in the DMX Universe.

4.10 PANIC MENU

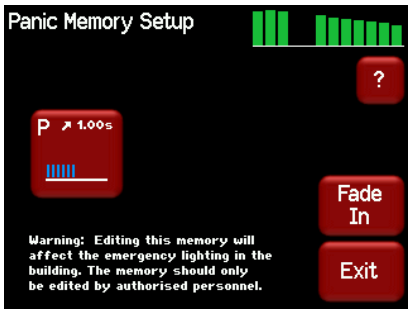
The "Panic" function provides emergency evacuation lighting that can be easily recalled by either a simple "Panic" or "Evacuate" button or it can be connected to a BMS (Building Management System) so that it is automatically operated when a fire alarm is activated.
The "Panic" input is a dry contact closure that stops all current output of the dimmer and replaces it with a "Panic Memory" that you have created in the LDT dimmer. This memory will typically contain channel levels that will provide suitable lighting for evacuation purposes. A separate contact closure is required to release the panic memory. When Panic has been activated, "Emergency Memory Active" flashes on the screen.



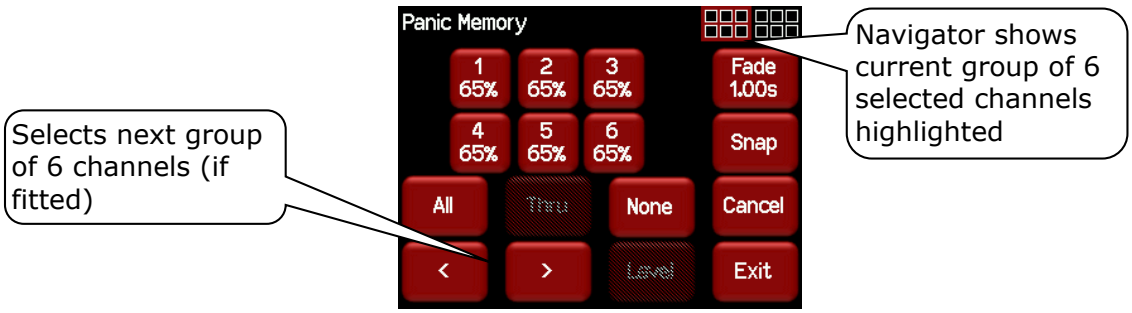
See the "Installation" section for details on how to connect the Panic and Release buttons.

Selecting [**Config**] [**Panic**] provides menus for:

- Creating, editing the Panic Memory (P).
- Activating the Panic Memory for testing purposes.

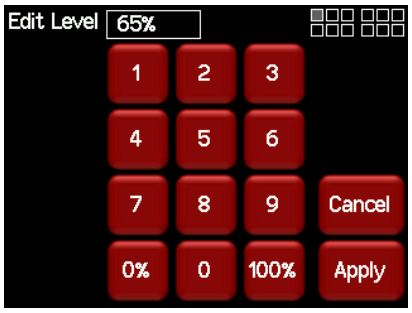


The "P" button shows a bargarph display of the current Panic memory and also its fade time in seconds.
Pressing the [**P**] button allows you to create or edit the memory.
You can either take a [**Snap**] (snapshot) of the current DMX input signal or the current state of the LDT dimmer's Outputs or select a channel(s) and manually set their levels using the controls on the screen.



4.10.1 Manually Setting Channel Levels

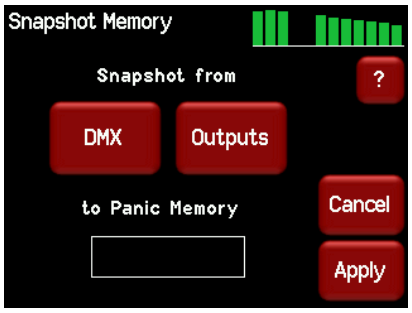
The "Panic Memory Setup" menu (above) shows the first 6 channels. Use the [**<**] or [**>**] buttons to see the other groups of 6 channels (if fitted). The navigator at the top right of the screen shows current group of 6 selected channels highlighted.
The default setting for the Panic memory is for all dimmer channels at an intensity of 65% and all non dim channels set to ON.
Touch a channel to select it (it turns grey). 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**].



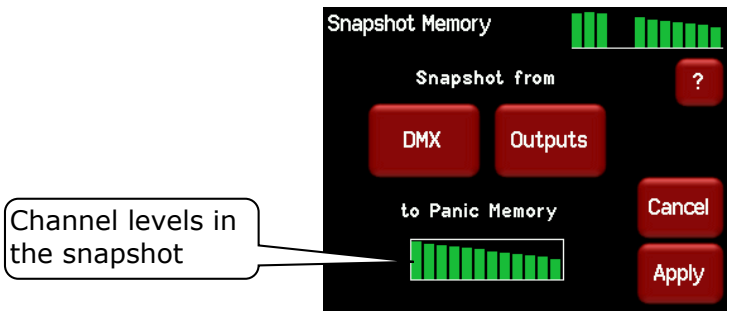
Use the keypad to set the level then press [**Apply**].

4.10.2 Taking a Snapshot

To create a "Panic" memory by taking a snapshot, press [**Snap**] from the "Panic Memory" menu above.



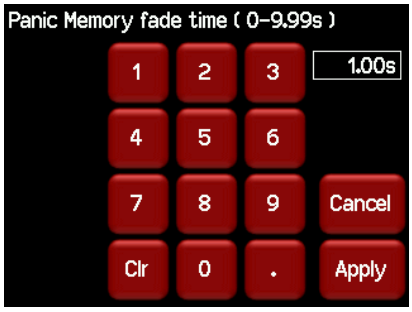
Pressing [**DMX**] will take a snapshot of the current DMX input signal.
Pressing [**Outputs**] will take a snapshot of the current output of the LDT dimmer. These channel levels could be coming from DMX, Memories, Riggers Control or a combination of all three.
When you take the snap, the channels levels will be displayed in the box below the memory name.



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.

4.10.3 Fade Time

When editing the Panic memory (above), you can set a fade time for the memory by pressing [**Fade**].

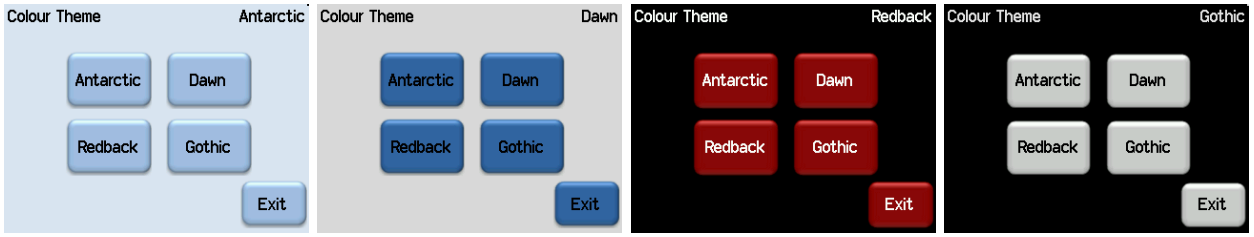


Enter a time in seconds (0 to 9.99) then press [**Apply**].
See the "Installation" section for details on how to connect a "Panic" button.

4.11 COLOUR THEME MENU

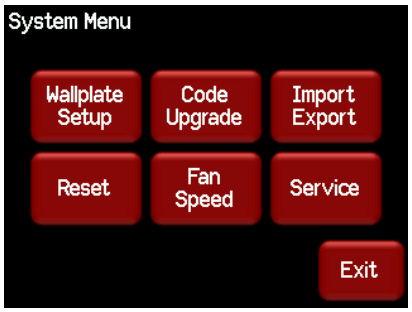
Selecting [**Config**] [**Colour Theme**] provides menus for changing the colour of the display.

The choices are:



4.12 SYSTEM MENU

Selecting [**Config**] [**System**] provides menus for the following functions:



4.12.1 Wall Plate Setup

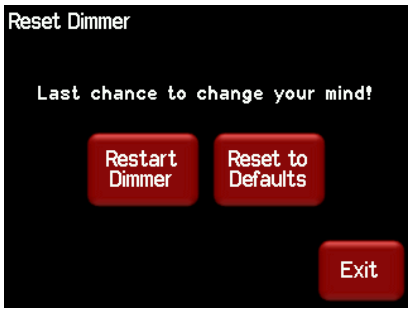
The "Wall plate Setup" menu provides functions for configuring the operation of wall plate switches connected to the LDT dimmer. Wall plates are used to control any of the 6 lighting memories that you have stored in the LDT dimmer. Jumpers inside each wall plate allow you to configure them so that any of the buttons can control any of the 6 memories.

See section 2.4.5 for details on how to connect wall plates to the LDT dimmer.

See section 5 for details on how to configure wall plate operation.

4.12.2 Reset

The LDT dimmer provides two different types of reset function.



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4.12.2.1 Restart Dimmer

In the unlikely event that the LDT dimmer 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.

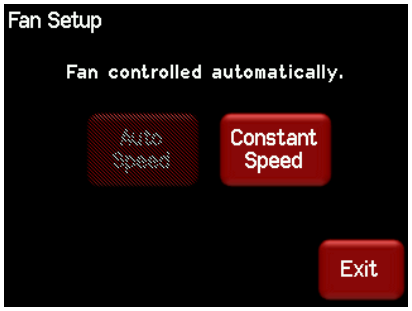
4.12.2.2 RESET To Defaults

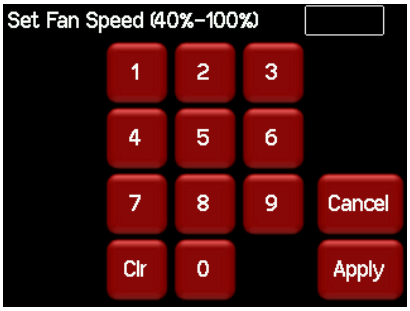
This will ERASE all memory from the LDT dimmer and reset to defaults.

4.12.3 Code Upgrade

See section 10 for details.

4.12.4 Fan Speed

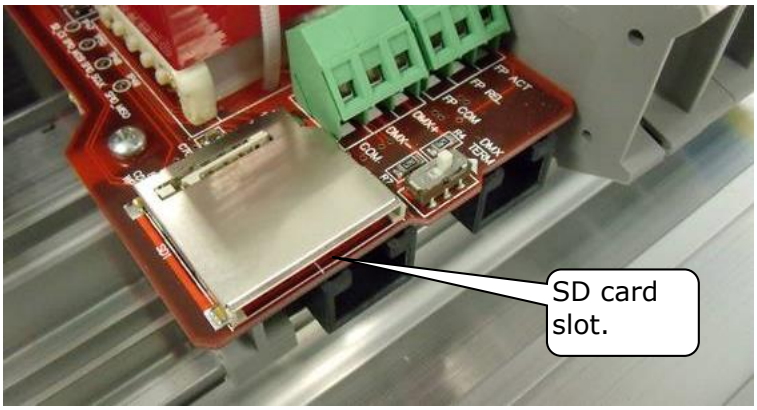




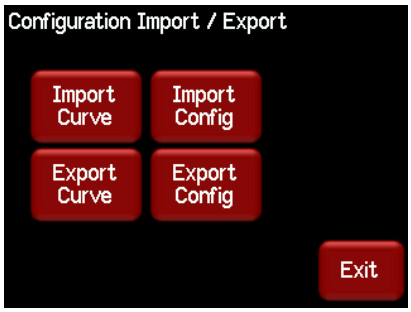
The fan speed is set automatically by default. You can set a constant fan speed to minimise noise. Press **[Constant Speed]** and enter a speed value. The range is 100% to 40% and 0% (fan stopped).

4.12.5 Import/Export

The configuration and/or dimmer curve of your GenVI 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 inside the cabinet. To access the card slot remove the front right panel (beware or the live terminals).



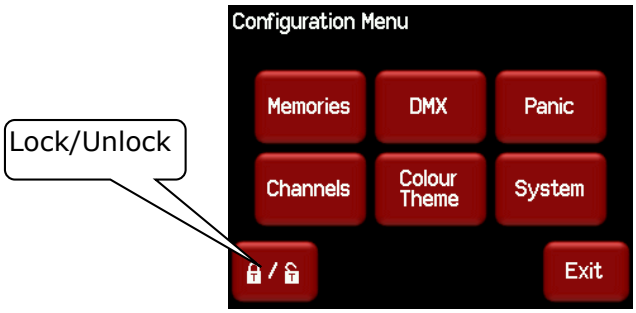
The configuration file has a fixed name. If you need to use multiple configurations than you should either use a separate SD card for each configuration or use a single SD card and manage your files on a computer.
To export or import a file press **Config**, **System**, **Import/Export**.



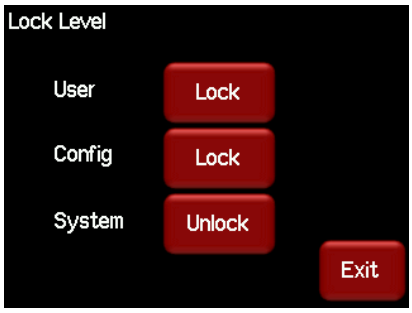
If there is no SD card in the dimmer or no file on the card then the buttons are greyed out.

4.13 LOCK / UNLOCK

To **lock** the touch screen of the LDT dimmer and prevent unauthorised access press [**Config**].

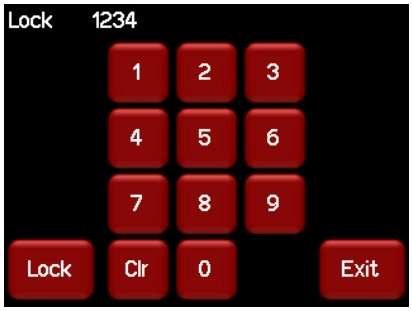


Pressing the "Padlock" symbol provides 3 levels of lock.



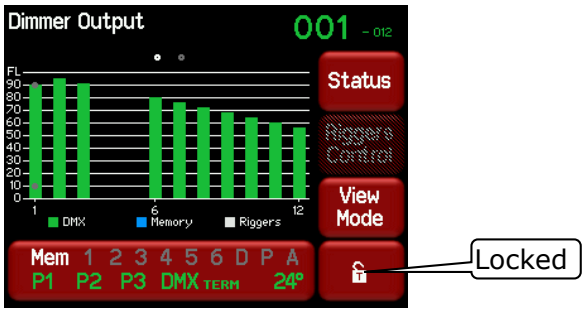
- User. Locks out the "Config", "Riggers Control" and "DMX Address" menus.
- Config. Locks out the "Config" menus.
- System. Locks out the "System" menu and the "Lamp Type" selection in the "Channels" menu.

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.



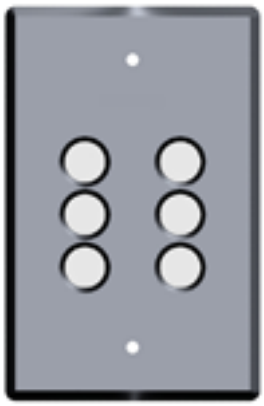
To unlock, press the [**Padlock**] symbol and enter your 4 digit code.

5 Wall Plates

5.1 OVERVIEW

Wall plates are optional remote control switch plates that can be used to control any of the 6 internal memories that are stored in the LDT dimmer. Memories are recorded (or edited) from the LDT dimmer's LCD touch screen. Memories are recalled from wall plates or from the LCD touch screen.

Wall plates are available with either 1, 2 or 6 buttons. Each button has a LED indicator which always glows dimly. The LED will flash when its memory is fading up or down and is bright when its memory is active. The colour of the LED can be selected by jumpers inside the wallplate.

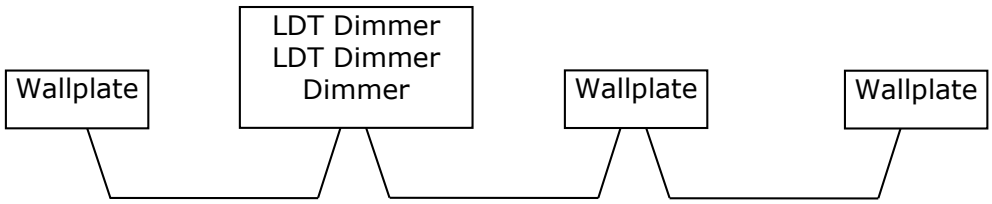


6 Button Australian Format

UK Format Wall Plates

5.2 INSTALLATION

Wall plates are connected to the LDT dimmer using CAT5 cable. All connections are via industry standard RJ45 connectors. Wall plates require all 8 wires in the CAT5 cable to be connected. Two wires are used for power and 6 wires for the control signals. The LDT dimmer and the wallplates have 2 RJ45 connectors allowing the cable to be daisy chained from plate to plate.



5.2.1 RJ45 Connections

Pin Number	Function
1	Control Line 1
2	Control Line 2
3	Control Line 3
4	+ V Power
5	Control Line 4
6	Control Line 5
7	Control Line 6
8	Ground

5.3 CONFIGURATION

Wall plate configuration requires the following steps as described below:

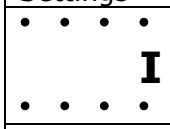
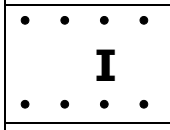
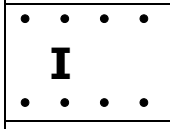
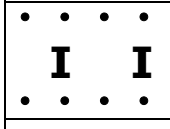
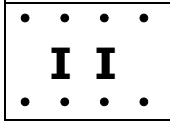
1. Set the Wallplate Jumpers. See section 5.3.1
2. Configure the Wallplate Setup menu in the LDT dimmer to set the function of each button. See section 5.3.3
3. Create the memories that will be controlled by the buttons. See section 4.7.

You can skip steps 1 and 2 if you accept the default setting of the Wallplate jumpers and Wallplate setup. The default settings are that buttons 1 to 6 will "toggle" (on/off) memories 1 to 6 respectively.

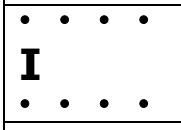
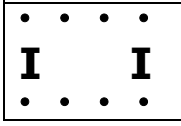
5.3.1 Wallplate Mode Jumper Settings

Memories 1 to 6 in the LDT dimmer are controlled by control lines 1 to 6 respectively. The buttons on the wallplates are connected to the control lines by 4 "Mode" jumpers (adjustable connections) inside the wallplate. These jumpers allow you to change the connections in the 1 button and 2 button wallplates as listed in the table below. Wallplates are shipped from the factory with the jumpers set so that buttons 1 to 6 are connected to control lines 1 to 6 respectively.

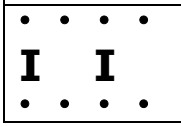
1 Button Wallplate Jumper Settings

Jumper Settings	Button connected to Control Line:
	1 (factory setting)
	2
	3
	4
	5
	6

2 Button Wallplate Jumper Settings

Jumper Settings	Buttons 1 & 2 connected to Control Lines:
	1 & 2 (factory setting)
	3 & 4
	5 & 6

6 Button Wallplate Jumper Setting

Jumper Setting	Buttons 1 to 6 connected to Control Lines:
	1 to 6 (factory setting)

Buttons on different wall plates may be connected to the same control line so that the same memory can be controlled from several locations.

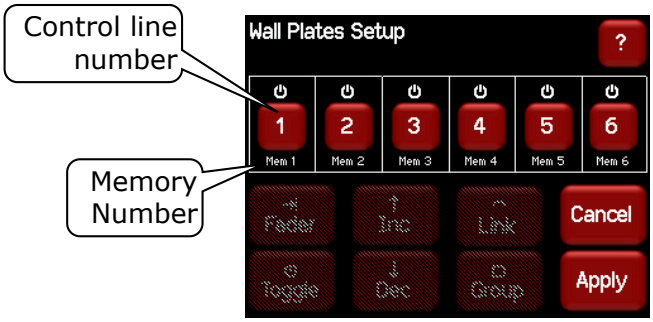
5.3.2 Wallplate LED Colour Jumper Settings

The colour of the LED indicators can be set to be red, green or blue or any combination of these 3 colours by setting the Red, Green and Blue jumpers (adjustable connections) inside the wallplate.

5.3.3 Wall Plates Setup Menu

The default configuration of the "Wall Plates Setup" menu is for buttons 1 to 6 to "Toggle" memories 1 to 6 ON or OFF. Therefore, press a button to fade up its memory. Press it again to fade it down.
For example, pressing button 1 on a wall plate (with default button jumpers) would fade up memory 1. Pressing it again would fade it down.

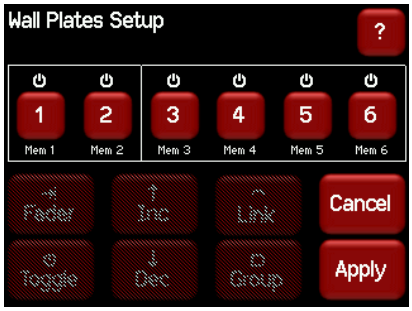
Selecting [**Config**] [**System**] [**Wall plate Setup**] reveals the "Wall Plates Setup" menu:



This menu allows you to group and link buttons and then change their functions as described below.

5.3.4 Group

Adjacent buttons can be grouped (or un-grouped) by selecting them and clicking [**Group**]. For example, a 2 button group and a 4 button group could be configured as follows:

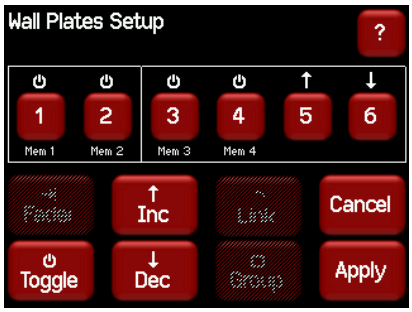


Buttons in a group can be configured as either "Toggle", "↑ Inc" or "↓ Dec".

"↑ Inc" or "↓ Dec" buttons are usually configured in groups that contain 3 or more buttons. One or more buttons in the group are set as "Toggle" and they control their relevant memory(s). The "↑ Inc" or "↓ Dec" buttons in the group then allow you to control (raise or lower) all the active (faded up) memories in the same group.

- Each press of a ↓ Dec button on a wall plate will decrease the intensities of the ACTIVE memory(s) in the group by 5%.
- Each press of a ↑ Inc button on a wall plate will increase the intensities of the ACTIVE memory(s) in the group by 5%.

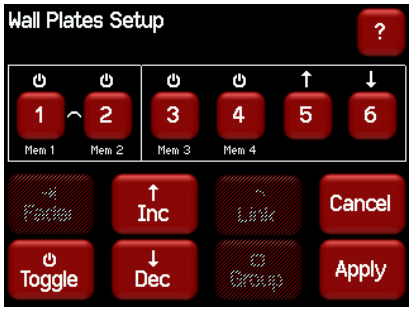
To configure a button as "↑ Inc" or "↓ Dec", there must be a "Toggle" button in the same group. Select a button in the group then press either [↑ **Inc**] or [↓ **Dec**].
For example, buttons 5 and 6 have been configured as ↑ Inc and ↓Dec:



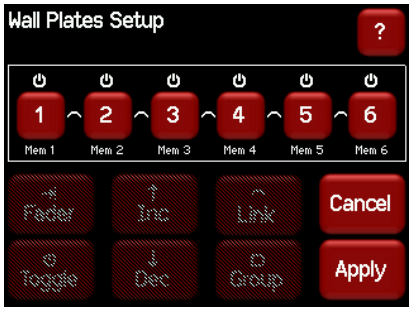
Therefore, in the example above, pressing the button for control line 3 will fade up memory 3. Pressing the button for 6 will decrease all of the channel levels in memory 3 by 5%. Press it again for another 5% decrease. Presses of the button for 5 will fade memory 3 back up.
Note: With this configuration, memories 5 and 6 are no longer available.

5.3.5 Link

Adjacent "toggle" buttons within a group can be linked (or un-linked) by selecting them and clicking [**Link**].
A Linked button ACTIVATES its memory and DEACTIVATES all other memories to which it has been linked.
For example, buttons 1 and 2 have been linked.



Pressing control line 1 will fade up memory 1.
Pressing control line 2 will fade up memory 2 AND fade down memory 1.
Pressing control line 1 again will fade up memory 1 AND fade down memory 2.
In the following example, a 6 button wall plate controls 6 memories and only the latest memory to be pressed will be active.



6 Alarms and Troubleshooting

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

6.1 MAINTENANCE

Ensure that the air vents at the top, bottom and front of the frame are free from dust.
Check that all connector screw terminal are tight. This must be performed by a suitably qualified person.
Check that the LDT dimmer contains the latest software release.

6.2 ALARMS

The "Status Summary" button at the bottom of the LCD "Home Screens" indicates the following:

- **P1**, **P2**, **P3** show the presence of the input power phases. Flashing **Red** is not present.
- **DMX** shows the presence of a DMX control signal. Flashing **Red** is not present.
- **Temperature.** There is a separate temperature sensor for each bank of 6 dimmers. The display shows the highest temperature from all of the sensors. If the temperature of the LDT dimmer is too high, the temperature display on the LCD will flash **Red** and ALL OUTPUT from the LDT dimmer is automatically switched OFF. Either reduce the load or increase the cooling to reduce the temperature. When the temperature returns to normal, the LDT dimmer automatically returns to normal operation.

6.3 TROUBLE SHOOTING

If a channel is not working check the MCB (Miniature Circuit Breaker) for that channel.
If the MCB has tripped (OFF), firstly try to determine the cause of the breaker tripping. It could be a blown lamp or a circuit overload. Rectify to problem (replace the lamp or reduce the load) then restore the MCB. If the MCB continues to trip, refer the problem to a suitably qualified person.

6.3.1 Rigger Test

You can test the operation of a dimmer channel from the "Riggers Control" on the LCD touch screen. See section 4.4.1.

6.3.2 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. See sections 4.9 and 4.7.4

6.3.3 Wallplate Control

If the dimmer is working from the Riggers Control but not via Wallplate memories:

- Check that the dimmer is correctly configured for Memory control. See section 4.7.4
- Test the memory by fading it in using the LCD touch screen. See section 4.8.2.
- Check that the Wallplate is connected and correctly configured. See section 5.

7 DMX Explained

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

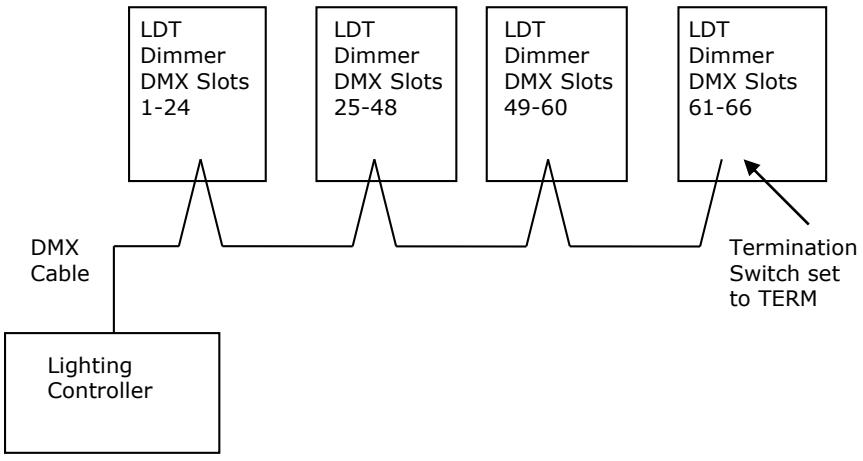
The LDT dimmer uses a high impedance DMX input circuit allowing you to loop the DMX signal from one LDT dimmer to the next. The last LDT dimmer in the chain must have the "DMX Terminate switch" set to TERM to terminate the line.

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

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



8 RDM Explained

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

Since the inception of DMX it had always been a 'one way' control system. Data only ever flowed 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!

The addition of RDM changed 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.

LSC's LDT dimmer range are RDM enabled products. This allows you to use RDM to interrogate the dimmer to find out its status and also to set its DMX address, soft patch it, and a host of other functions.

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.

9 Specifications

Power Input	Nominal: 220-240 Volts. 3-phase star (380-415V). 50-60Hz (Single phase operation possible. See section 2.4.1) Operating range : Typically 190-260V, 45-65Hz 3-phase delta connection is available as a factory fitted option.	
Power Connection	Five 35mm2 terminals.	
Control Inputs	DMX512 (1990) or DMX512-A (E1-11) and RDM (E1-20) via 3-pin screw terminals. Wall plate control via RJ45 connections. (Wall plates available separately) Panic input via 3-pin screw terminals.	
Outputs	Standard screw terminals provided. One 4mm2 for each output circuit plus one 16mm2 neutral terminal and one 16mm2 earth terminal for each group of 6 circuits.	
Load Output per Channel	10A maximum load per channel, protected by 6kA rated thermal magnetic miniature circuit breaker (MCB). For LED only loads, it is recommended to limit the RMS current to 3A due to the inrush current.	
Optional RCD protection	One 3-phase unit for 6 and12-channel models.	
Duty Cycle	Rated at 100% across all channels simultaneously at 25°C ambient.	
Construction	Aluminium housing and zinc steel panels and polycarbonate labels.	
Mounting	The unit is wall mounted utilising keyhole cut-outs in 4 locations. A mounting template is provided with the unit.	
Dimensions and weights	6 channel dimmer	Dimensions: 47 x 43 x 12cm Box dimensions: 48 x 45 x 15cm Weight: 12 kgs
	12 channel dimmer	Dimensions: 69 x 43 x 12cm Box dimensions: 70 x 45 x 15cm Weight: 22 kgs

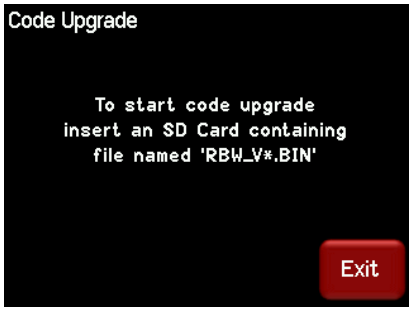
10 Software Upgrade

LSC Lighting Systems has a corporate policy of continuous improvement to its products. The LDT dimmer software (firmware) is subject to this policy as new features are added and existing features improved.

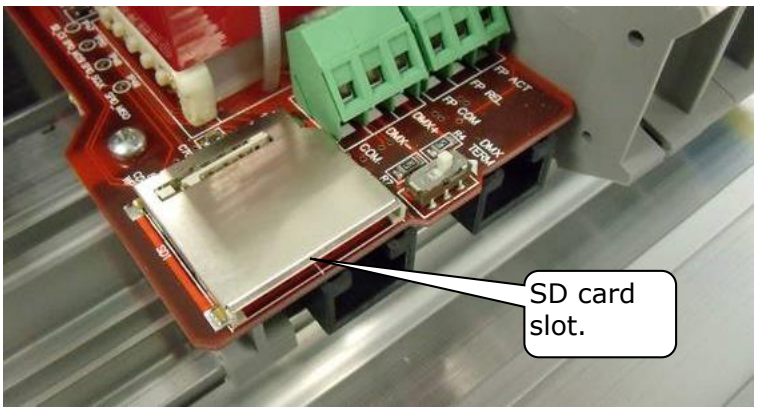
The software version of your LDT dimmer can be checked by pressing [**Status**], [**About**].

To upgrade your LDT dimmer software, download the latest version from the LSC web site, www.lsclighting.com and save the new software to an SD Card. Both HC and low density format cards are supported. The file will be called "RBW_V*.bin" where * is the version number.

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



Remove the front right panel (beware or the live terminals) and insert the SD card.



Follow the onscreen instructions.

11 Compliance Statements

11.1 CE COMPLIANCE STATEMENT

The **LDT 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).

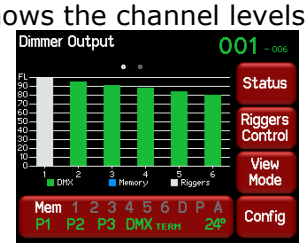
11.2 C TICK COMPLIANCE STATEMENT

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.

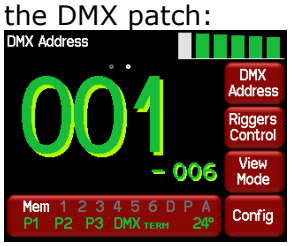
12 Quick Reference

12.1 HOME PAGES

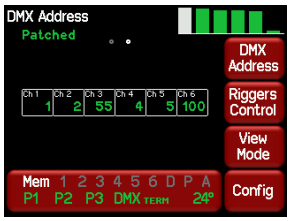
The "Dimmer Output" home page shows the channel levels.



Press [**View Mode**] to change to the home "DMX Address" home page.
The "DMX Address" home page shows the DMX patch numbers and has two possible formats depending upon the DMX patch:



"DMX Address" with 1 to 1 Patch.



"DMX Address" with Individual Patches.

Press [**View Mode**] to change to the "Dimmer Output" home page.

12.2 STATUS

The large "Status Summary" button shows the status of the Memories, input power phases, DMX and temperature of the LDT dimmer.

Press this "Status Summary" button to see legend for the button.

Touch anywhere within the help screen to cancel.

12.3 DMX CONTROL

To set a channel(s) to "DMX Only" control press; [**Config**] [**Channels**].
Select the required channel(s) then press [**Edit**].
Repeatedly press ▼ or ▲ to select the "Source" parameter.
Press [**DMX Only**] [**Apply**] [**Exit**].

12.3.1 DMX Patching

1 to 1 patch. From the "DMX Address" home page press [**DMX Address**].
Enter the DMX start slot number then press [**Apply**].
To individually patch channels to DMX slots press [**Config**] [**DMX**] [**Patch**]. Select a channel number(s) then press [**Set Address**]. Enter the DMX slot number and press [**Apply**].

12.3.2 DMX LOSS Memory

If the DMX input signal is lost, the LDT dimmer will hold the last DMX level indefinitely. If you set a delay time other than "Infinite", the LDT dimmer will fade to the "DMX Loss" memory when the delay time expires.
To set a DMX delay time press [**Config**] [**DMX**] [**Delay**]. Enter a time and press [**Apply**].
To create or edit a "DMX Loss" memory press [**Config**] [**DMX**] [**D**].
Either:

- Press [**Snap**] to take a copy of either the current [**DMX**] input signal or the current state of the LDT dimmer's [**Outputs**] then press [**Apply**]
- Select a channel(s) then press [**Level**]. Enter a level and press [**Apply**].

When finished press [**Exit**].

12.4 MEMORY CONTROL

To set a channel(s) to "Memory Only" control press; [**Config**] [**Channels**].
Select the required channel(s) then press [**Edit**].
Repeatedly press [▼] or [▲] to select the "Source" parameter.
Press [**Memory Only**] [**Apply**] [**Exit**].

12.4.1 Create or Edit Memories

To Create or edit a memory press;
[**Config**] [**Memories**]. Select a memory then press [**Edit**] either:

- Press [**Snap**] to take a copy of either the current [**DMX**] input signal or the current state of the LDT dimmer's [**Outputs**] then press [**Apply**]
- Select a channel(s) then press [**Level**]. Enter a level and press [**Apply**].

When finished press [**Exit**].

12.4.2 Playback Memories

To playback a memory either;

- Use a Wallplate button that has been programmed to control that memory number.
- Press [**Config**] [**Memories**]. Select a memory then press [**Fade In**]/[**Fade Out**].

12.5 AUTO SWITCH

Channels set to "Auto Switch" will be *automatically* switched from Memory (Wallplate) control to DMX control whenever the DMX lighting controller is on (and hence DMX is present).
To set a channel(s) to "Auto Switch", press; [**Config**] [**Channels**].
Select the required channel(s) then press [**Edit**].
Repeatedly press [▼] or [▲] to select the "Source" parameter.
Press [**Auto Switch**] [**Apply**] [**Exit**].

12.6 AUTO POWER

4. Auto Power. When "Auto Power" is activated, channels set to "Auto Power" are switched ON at full level whenever any DMX signal is present. "Auto Power" is used to provide constant "non-dimmed" power to fixtures whenever the DMX lighting controller is on (and hence DMX is present).
To set channel(s) to "Auto Power", press; [**Config**] [**Channels**].
Select the required channel(s) then press [**Edit**].
Repeatedly press [▼] or [▲] to select the "Source" parameter.
Press [**Auto Power**] [**Apply**] [**Exit**].

12.7 RIGGERS CONTROL

From either home page press [**Riggers Control**].
The output of the Riggers Controls can be turned off or on by pressing
[**De activate**]/[**Activate**].
To set the level of a channel(s), use the virtual faders or switches.
To disable the levels set on the faders press [**De-Activate**].
When finished press [**Exit**].

12.7.1 Chaser

To activate the chaser, from the "Rigger Control" (above), press [**Chaser**].
To enable the Chaser press [**Activate**].
Use the buttons to select a pattern for the chaser.
Set the direction with [**I>>>I**] (forward), [**I<<<I**] (reverse) or [**I<>I**] (bounce from end to end).
Set the speed in BPM (Beats Per Minute).