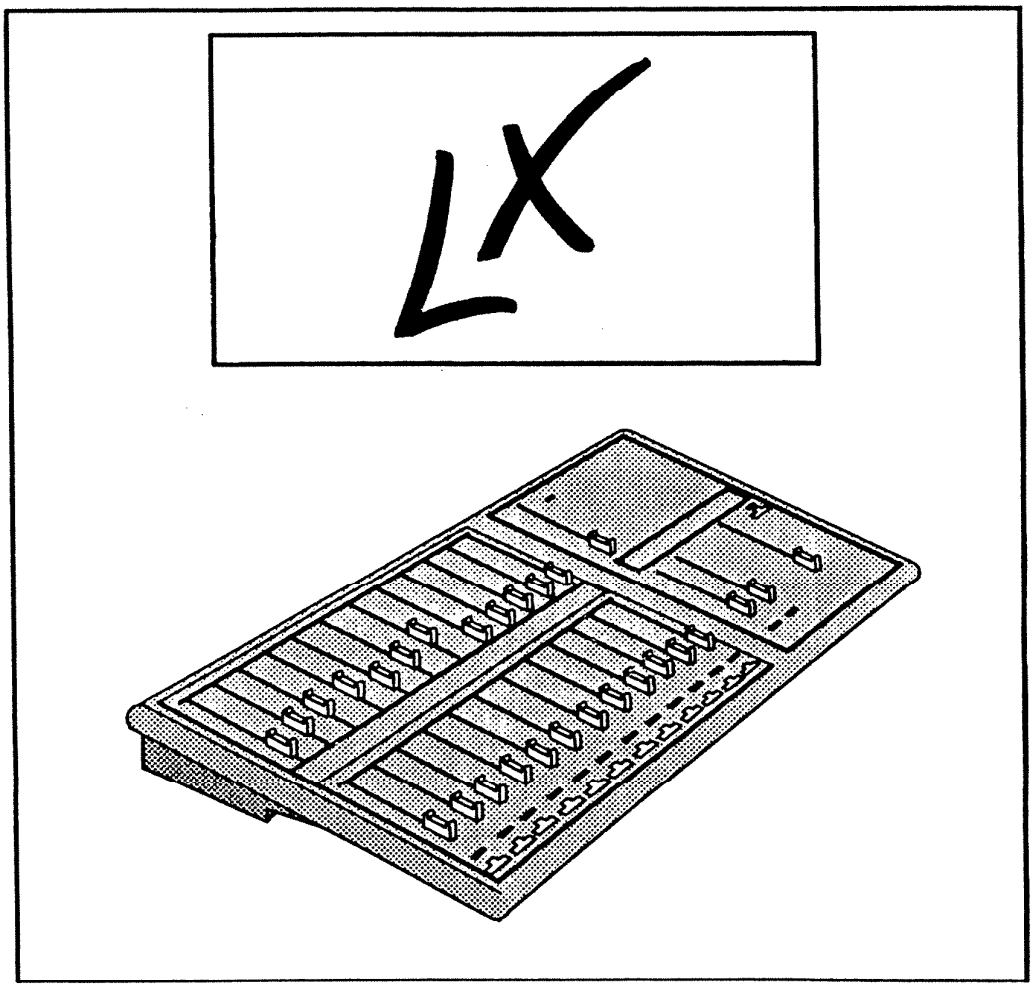
USER GUIDE



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Strand Lighting

Contents

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1. Introduction

LX is a compact, portable, easy to use, 'manual' lighting control console.
The LX console provides analog, wire-per-dimmer control outputs, intended for connection to portable dimmer packs, but which may also be used with 'permanent' dimmer installations.

Features

+ Two versions :–
  European version providing dimmer outputs of 0V (off) to –10V (full on) in 3 sizes – 12, 18, or 24 channels
  North American version providing dimmer outputs of 0V (off) to +10V (full on) in 2 sizes – 12 or 24 channels
+ Two presets of Channel faders with dipless crossfade master controls
+ A Fade Time control fader
+ A Flash Switch (Bump Button) for each channel, with an overall Flash Level master fader
+ An 'output' LED indicator for each channel
+ Console power supplied from a mains powered battery eliminator. Alternatively, European models may be powered from Strand Lighting ACT or Tempus dimmer packs.

2. Installation

Location

The compactness and low profile of the LX console allow table–top positioning without any special mounting requirements, and make LX equally suitable for temporary or fixed installation. However, care should be taken when choosing a location for the console; The operator should have a clear view of the performance area, and there should be adequate and controllable low–level lighting for the console, and for cue sheets, scripts etc.

A dust–free environment and 'office' level cleanliness are vital for reliable operation of the LX console. It is strongly recommended that it is covered when not in use.
To enhance the reliability of the LX, it is recommended that the ambient temperature is maintained within the range 15-25°C during operation, and that the humidity is maintained at less than 90% Relative Humidity.
At no time must condensation be allowed to form on or inside the equipment.
Care must be taken to avoid any build up of static electricity in the vicinity of the LX, as excessive discharges may adversely affect equipment operation.

Unpacking

Unpack the unit carefully. Inspect the LX console (and Battery Eliminator, if supplied) to ensure that no damage has occurred during transit. Should any damage be evident, or any parts be missing, please inform Strand Lighting Ltd. or your supplier without delay. Also ensure that the correct version of LX has been supplied.

It is recommended that the original packing materials are retained for use during transport of the unit, or for protection during storage. However, if the console is to be part of a touring system, it is recommend that a suitable protective transit case be manufactured.

Connection to Dimmers [–10V control]

Connection to the dimmers is via 8 pin DIN sockets situated on the rear of the LX console.

Each 8 pin DIN connector carries six dimmer control signals, a Dimmer Common signal (also known as Technical Earth or zero volts), and a –15V Power signal.
12 channel LX consoles have two 8 pin DIN connectors – dimmers 1 to 6, and dimmers 7 to 12. 18 and 24 channel LX consoles have three and four 8 pin DIN connectors respectively – dimmers 13 to 18, and dimmers 19 to 24.

Suitable connection cables are available from Strand Lighting.

Pin connections for an 8 pin DIN socket are shown below, together with cable colours for 8 core control cable.

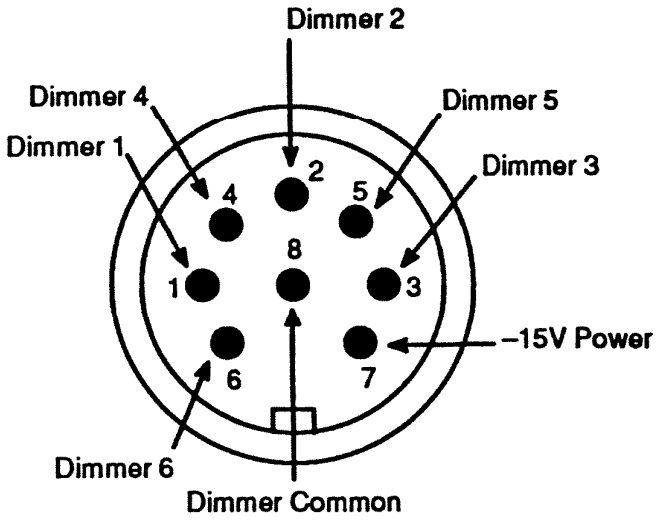


Figure 1. – Dimmer Connections – 8 pin DIN Socket

Function	Colour	Function	Colour
Dimmer 1	Red	Dimmer 5	White
Dimmer 2	Blue	Dimmer 6	Black
Dimmer 3	Green	–15V	
Dimmer 4	Yellow	power	Brown
		Dimmer	
		Common	Violet

Connection to Tempus, ACT3 or ACT6 Dimmers

The control input to a Tempus, ACT3 and ACT6 dimmer pack is via an 8 pin Bleecon socket. These sockets will mate correctly with 8 pin DIN plugs, although the plugs will not latch into the sockets. The LX system should be connected to the dimmers using appropriate cables fitted with 8 pin DIN plugs. Alternatively, if latching connectors are required, the cables should be fitted with an 8 pin latching DIN plug at one end, and an 8 pin Bleecon plug at the other.

nb. Unless the LX is to be supplied with power from a Battery Eliminator, it must be connected to a minimum of two Tempus, ACT3 Master or ACT6 dimmer packs, in order to ensure that it receives sufficient power for correct operation. This is irrespective of whether the LX has 12, 18, or 24 channels.

Connection to Other Types of Dimmer

–10V versions of LX may be operated with other types of dimmer, provided that they will accept a 0V to –10V control voltage.

A Battery Eliminator will be required to power the LX, unless the dimmer rack(s) incorporate a suitable –15V DC power supply. This power supply (or a combination of more than one power supply from several portable dimmer packs) must be capable of supplying at least 200mA at –15V.

If there is any doubt that the dimmers on site are suitable, please contact the manufacturer of the dimmers, Strand Lighting, or an approved Strand Lighting Service Agent.

Once it has been verified that the dimmers will operate with the LX, construct and install an appropriate set of adaptor cables to connect them to the DIN sockets on the LX.

Control Cables, and Extensions

When selecting cables for the connection of an LX to dimmers, it is important that the correct size and type are chosen.This is of particular importance where European LX systems are to be powered from the dimmer packs, as the use of control cables which are too small may result in power losses along the cables, and in turn lead to malfunction of the overall installation.

In such installations, the control cable size to be used will depend on the required length of the control cables :–
For distances up to 100 Metres, the recommended cable is PVC insulated multicore with a core size of 0.22mm^2 (7/0.2mm).
For distances up to 200 Metres, the recommended cable is PVC insulated multicore with a core size of 0.5mm^2 (16/0.2mm).
For distances above 200 Metres, it is recommended that the LX is powered from a Battery Eliminator. Please contact Strand Lighting, or an approved Service Agent, for advice.

Connection to Dimmers [+10V control]

Connection to the dimmers is via 15 pin Min-D sockets situated on the rear of the console. Each Min-D connector carries 12 dimmer control signals and the Dimmer Common signal.
12 channel LX consoles have one 15 pin MIN-D connector. 24 channel LX consoles have two 15 pin Min-D connectors.

Pin connections for Min-D type connectors are shown below, together with cable colours for 18 core control cable.

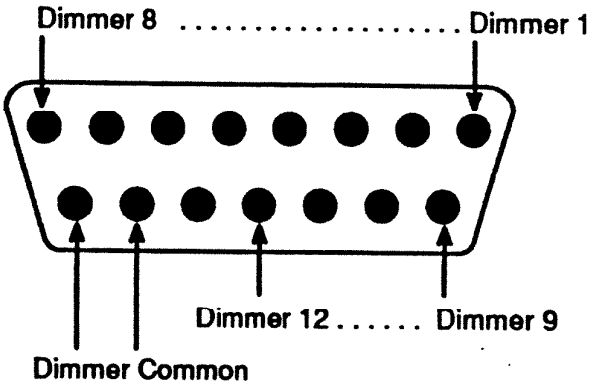


Figure 2. – Dimmer Connections – Min D-Type Socket

Function	Colour	Function	Colour
Dimmer 1	Red	Dimmer 10	Pink
Dimmer 2	Blue	Dimmer 11	Cyan
Dimmer 3	Green	Dimmer 12	Slate
Dimmer 4	Yellow	Dimmer	
Dimmer 5	White	Common	Red/Blue
Dimmer 6	Black	Not used	Green/Red
Dimmer 7	Brown	Not used	Yellow/Red
Dimmer 8	Violet	Not used	White/Red
Dimmer 9	Orange	Not used	Red/Black
		Not used	Red/Brown

+10V versions of LX may be operated with various styles of dimmer, provided that they will accept a 0V to +10V analog control voltage. If there is any doubt that the dimmers on site are suitable, please contact the manufacturer of the dimmers, Strand Lighting, or an approved Strand Lighting Service Agent.

Once it has been verified that the dimmers will operate with the LX, install appropriate wiring to connect them to the LX.

Note: +10V versions of LX require a power supply from a Battery Eliminator.

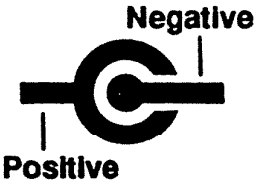
Battery Eliminator

This will not be required if the LX is a –10V version and is to be powered from the dimmer packs.
Ensure that there is a nearby mains power socket, into which the Battery Eliminator may be plugged. This socket must be positioned so that there is a free flow of air for ventilation of the Battery Eliminator, and that the power cable will reach the LX without imposing any strain on the cable or connectors.

Check that the Battery Eliminator provided is correct for the local mains voltage,
– either 240V (UK), 220V (other European countries), or 120V (USA).

Connect the wire from the Battery Eliminator to the power socket on the LX console. Plug the Battery Eliminator into the mains socket.

Caution! If the Battery Eliminator has not been supplied by Strand Lighting, ensure that its output connector is wired with the correct polarity – as shown in the diagram.



Testing

Following installation and connecting, the LX and dimmers must be tested to verify that all is correct :–

Check all connections.
Connect a luminaire to each of the dimmers.
Follow the steps outlined on page 10, to check that the LX console and dimmers are operating. Raise the fader for each channel in turn and check that the appropriate luminaire can be controlled.

If the dimmers do not respond correctly, switch off all the equipment, re–check all connections and settings, and repeat the sequence.

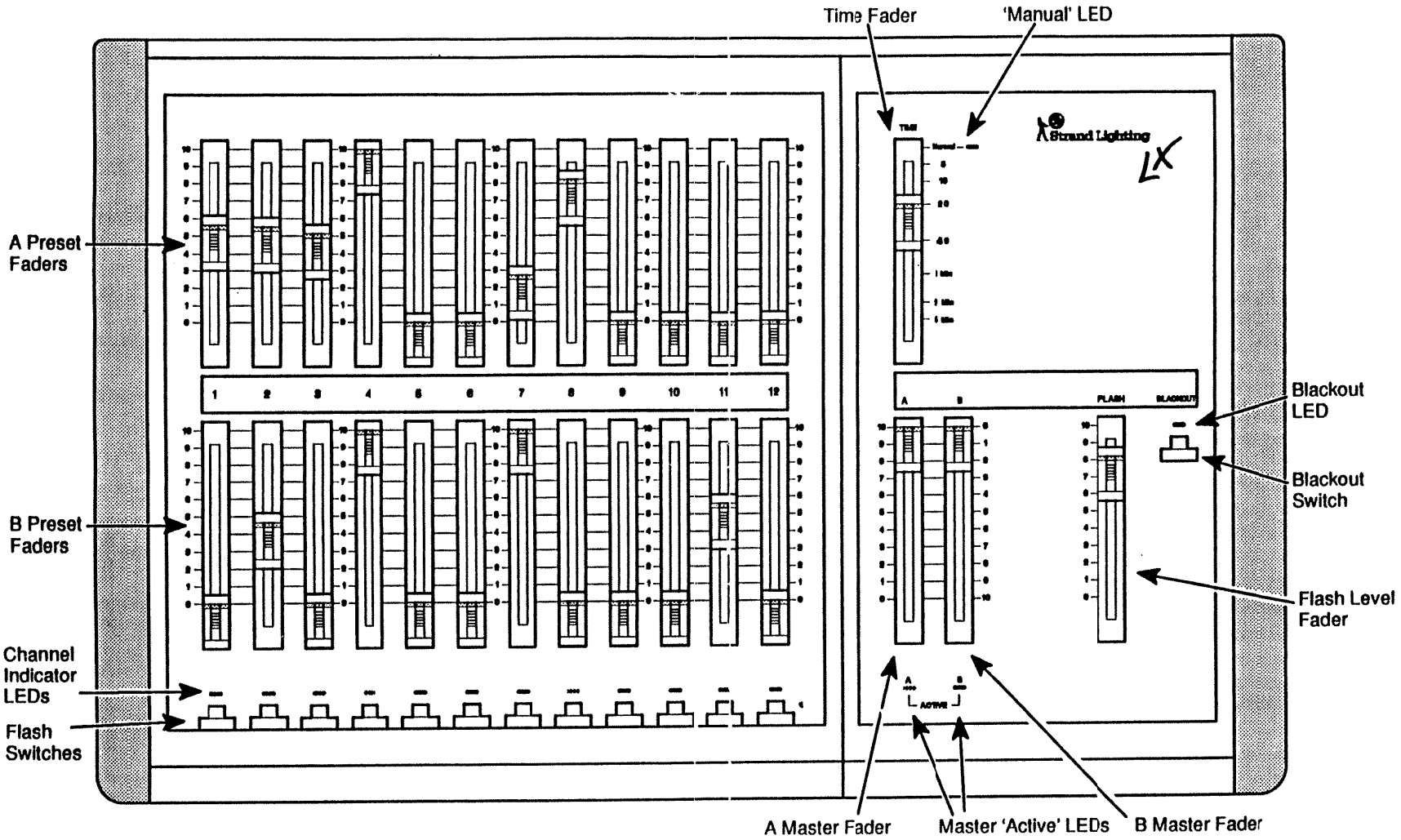


Figure 3. – LX Front Panel Layout

3. Operation

Refer to Figure 3. – Panel Layout diagram on pages 8 and 9 as required.

Turning On

LX does not incorporate an On / Off switch. The console comes into operation as soon as power is applied. The source of power is either from a mains powered Battery Eliminator, from the dimmer packs – depending on the installation and the version of LX.
In order to prevent the possibility of a sudden switch-on of dimmers (and lights) as the LX is turned on, it is suggested that all Channel faders are set at 0 before applying power,
Ensure that the plug from the Battery Eliminator (if being used) is correctly inserted into its socket on the rear of the console.
Turn on the dimmers (and the Battery Eliminator if required). The console is now ready for use.

Basic Control of Levels

Before operating the LX, check that the red Blackout indicator is not lit. If it is, press the Blackout switch momentarily to turn off the indicator.
Set the A Master fader at 10, the B Master fader at 0, and the Time fader at Manual. (ie. all at the top of their travel)
The Preset A faders can now be used for controlling the level of individual channels as required.
This is the basic form of operation. The Channel indicator LEDs below the faders will light up as the faders are raised, giving an indication of channel level.
Note: At levels below about 25%, the level of indication is very dim (and not readily visible).
'Active' indicators, below the A and B Master faders, light when the corresponding Master fader is raised to a level of more than approximately 10%.

Producing a Manual Crossfade between Presets

Set up a lighting scene using the Preset A faders. This scene will be 'live' because Master fader A is at 10.
With Master fader B at 0, set up a different scene using the Preset B faders. This scene will not affect the dimmers at this stage because the B Master fader is at 0.

Move both the A & B Master faders downwards, together. A crossfade will occur between the Preset A scene, and the Preset B scene. With the Time fader at Manual, the time taken by the fade will depend entirely on the speed of moving the A & B Master faders.
Moving the faders back upwards will return to the Preset A scene.

The 'Active' and Channel level indicators will change to follow the alterations in Channel levels.

If the A & B Master faders are not moved together, the fade-in of the B Preset and the fade-out of the A Preset will occur at different rates. This allows the 'incoming' lighting scene to either lead, or lag, the 'outgoing' lighting scene. Some experimentation with this may be required in order to fully appreciate the possible effects.

Combining Channel Levels

When both A & B Masters are 'active' (eg. during a fade), LX combines the levels from both A & B Presets for each individual channel. This combination takes the form of adding the mastered levels together, whilst at the same time, limiting the final output level to the highest level set in either the A or B Preset. This means that, during a fade, a channel level will never rise above the higher of its two preset settings.
However, it is possible for a channel level to 'dip' below the lower of its two preset levels if the outgoing scene is faded out before the incoming scene is faded in. In fact, if both A & B Master faders are moved to their 0 positions, both Presets will be at 0, and all channel outputs will also be at 0.

Dipless Crossfades

LX operates 'dipless' crossfades – as long as the A & B Master faders are moved together.
This means that all channels make smooth transitions from their current levels to their new levels, without 'dipping' or 'surging' during the fade. In addition, any channels which have the same level in the starting scene and the finishing scene will be unaffected during a fade. This 'dipless' crossfade operation will also occur when the fade of the incoming scene is faster than that of the outgoing scene.

Producing a Timed Crossfade between Presets

With the two scenes already set up on Presets A & B, and with the A & B Master faders pushed fully upwards, Preset A will be live. Move the Time fader away from the Manual position (eg. to the 10 second position). Move the A & B Master faders downwards together, to the end of the scale. A smooth crossfade will occur between the Presets, at a rate corresponding to the setting of the Time fader.

Note: The A & B Master faders must be moved faster than the selected fade time for the timers to operate correctly.

Note: The markings by the Time fader give only approximate times for fade durations.

If the Time fader is moved whilst a fade is in operation, the fade will speed up or slow down accordingly.

If a Master fader is not moved totally from one end of its scale to the other, the fade controlled by it will stop at an appropriate intermediate level. The time taken will be a corresponding proportion of the total fade time set on the Time fader.
If the Master fader is then moved further (or reversed towards its original position) the fade will then continue (or reverse) at the same rate.

Blackout

When the Blackout button is pressed, it will instantaneously set all channel output levels to 0. The Blackout indicator will light up red to indicate that Blackout is on. Channel levels will be instantaneously restored to their previous values (unless Channel or Master faders have been moved) when the Blackout switch is pressed again.

The setting of Blackout will be 'remembered' for approximately 5 minutes if power is removed from the LX. This prevents Blackout switching off should there be a short unintentional cut in power whilst Blackout is on.
If power is applied to the console after having been removed for more than 5 minutes, Blackout will be off.

Flashing Channels

Channels may be flashed to a selected level by pressing the Flash Switches below the faders.

The level to which channels are flashed is set using the Flash Level fader.
The Flash level, and the existing Channel level combine on a 'highest-takes-precedence' basis. It is not, therefore, possible to Flash a channel to a level lower than that to which it is already set.

If the Flash Level fader is set at 0% the Flash Switches will not operate.

Note: If the Master faders are not at either their 0 or 10 positions when a channel is Flashed, the accuracy of the 'highest-takes-precedence' system will be slightly reduced.

More complex Operation

Although LX is a simple lighting control, quite complex fade operations may be carried out. The following example is given as an illustration :–

It is required that channels lighting the background slowly fade up to simulate sunrise (channels 10, 11, 12). Whilst this slow fade is taking place, it is required that other channels change level in the foreground, but with much faster fades (channels 8, 9 up, channel 7 down). In the meantime other lighting must remain unaffected (channels 1 to 6).
This can be achieved as follows :–

Set Master A at 10 and Master B at 0.

Set channels 1 to 6, and 7 at their required initial levels on the A Preset, with the other channels at 0.

Set channels 10,11,12 at their required final levels on the B Preset with the other channels at 0.

Set the Time fader to a slow time. (eg. 5 minutes)
Move the B Master fader to 10. Leave the A Master fader at 10. The slow fade will start.

At the appropriate stage during the slow fade, move Channel faders on the A Preset – channel 7 to its new lower level, and channels 8 and 9 to their new higher levels.

When the slow fade has finished, carefully set channels 10,11,12 on the A Preset to the same level settings as on the B Preset. The actual output levels will not alter while this is done.

Finally, set the Time fader to a few seconds (or 0), and move the B Master fader to 0.
All channels are now controlled by Preset A, and Preset B may now be set up for the next lighting change.

This is just one example. Many other types of similar lighting effect are possible, although some practice and experimentation may be required to achieve the best results.

4. Servicing

Caution! LX does not contain any User Serviceable Parts.
For all maintenance, and for technical advice, please refer to your nearest Strand Lighting company or Strand Lighting approved Service Agent.

Cleaning and Inspection

It is recommended that LX consoles be cleaned and inspected on a regular basis. (At least once every 6 months)

Clean the surface of the console using a cloth which has been slightly dampened with water (and a little detergent, if necessary).

Caution! Do not use solvents, abrasive cleaners, or polishes, as these may damage the surface of the LX or its printed markings.
Do not allow any liquid to enter into the console.
Do not use spray cleaners, etc. as these may enter the faders and switches and cause malfunction or damage.

Inspect the console for any signs of damage. Operate each fader and switch in turn, checking for correct function.
Inspect the cables to the dimmers, and the Battery Eliminator (if part of the installation), ensuring that all connectors are properly inserted, and that no physical damage has occurred to connectors or cable insulation, and particularly

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Warning! As hazardous voltages are present within the Battery Eliminator, it must immediately be replaced in the event that any damage has occurred to it.

In the event that any damage (or other problem) is discovered, contact your nearest Strand Lighting company or Strand Lighting approved Service Agent to arrange for appropriate repairs to be carried out.

5. Part Numbers

The following list gives Strand Lighting order codes for LX consoles and accessories.

Complete Consoles (not including Battery Eliminators)

0480112	12 Channel LX European (-10V)
0480118	18 Channel LX European (-10V)
0480124	24 Channel LX European (-10V)
0480212	12 Channel LX N American (+10V)
0480224	24 Channel LX N American (+10V)

Battery Eliminators

0700090/UK	240V AC UK 13A plug pins
0700090/EC	220V AC 'Schuko' plug pins

Dimmer Cables

0480005	8 pin DIN – 8 pin DIN 5 metres
0480015	15 pin Min-D – open end 5 metres

Handbook

8804810	Maintenance Handbook

6. Specifications

Dimensions

	12 Channel	18 Channel	24 Channel
Width :	452mm	600mm	714mm
Depth :	285mm	285mm	285mm
Height :	65mm	65mm	65mm
Weight :	2Kg	3Kg	4Kg

Power Requirements

DC Voltage

From battery eliminator : –18V +/– 10%
From dimmer packs (–10V versions) : –15V +/– 10%

Note: Battery Eliminators supplied by Strand Lighting have a nominal output voltage of -15V, however, in practice the output voltage is slightly higher, and is sufficient to operate LX consoles.

DC Current Consumption

12 Channel	18 Channel	24 Channel
110mA	150mA	180mA

Note: These currents may increase slightly depending on the type of dimmers connected.

Control Outputs

–10V (European) versions :
0V (off) to –10V (full on) via a 10KΩ resistor and a silicon diode.
+10V (USA) versions :
0V (off) to +10V (full on) via a 1KΩ resistor and a silicon diode.
Maximum control current per dimmer – 1mA.

Ambient Operating Environment

Temperature : 0°C to +35°C
Humidity : 10% to 95% Relative Humidity - Non condensing
'Office Level' Cleanliness

Strand Lighting Main Offices

Note: Telephone numbers exclude international and national dialling codes.

Asia: 802 Houston Centre, 63 Mody Road, Tsimshatsui East, Kowloon, Hong Kong
Tel: 368 5161 Fax: 369 4890

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Tel: 3 646 4522 Fax: 3 646 6727

Canada: 2430 Lucknow Drive, Unit 15, Missisauga, Ontario L5S 1V3, Canada
Tel: 416 677 7130 Fax: 416 677 6859

England: Grant Way, Isleworth, Middlesex. TW7 5QD England
Tel: 081 560 3171 Fax: 081 568 2103

France: 26 Villa Des Fleurs, 92400 Courbevoie, France
Tel: 1 478 86666 Fax: 1 433 37175

Germany: PO Box 4449, 3300 Braunschweig, Germany
Tel: 5331 30080 Fax: 331 78883

Italy: Via delle Gardenie 33 (Pontia Vecchia Km 33,400), 00040 Pomezia-Roma, Italy
Tel: 6 919 7123 Fax: 6 919 7136

USA: PO Box 9004, 18111 South Santa Fe Avenue, Rancho Dominguez, CA 90221, USA
Tel: 213 637 7500 Fax: 213 632 5519

For names, addresses, and telephone numbers of approved Strand Lighting distributors and Service Agents, please contact a Strand Lighting office.