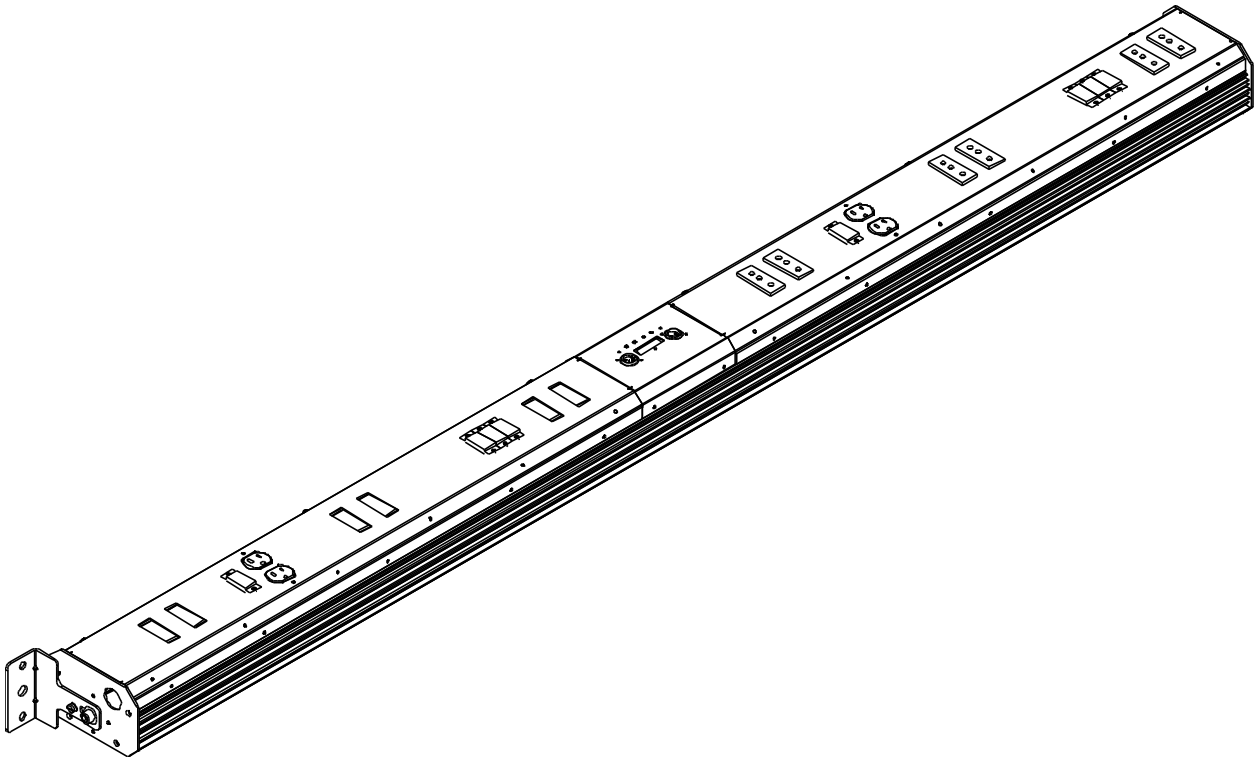
LDS-610 Installation and User's Manual

Publication number 21-1047 Rev C



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1 Introduction

The Leprecon LDS-610 dimmer is designed to be a reliable and serviceable installation dimmer. The form factor of the LDS-610 allows dimmers to be installed in facilities that may not have room for conventional systems.

With the menu-based interface, the dimmer can be configured for different applications, including stand-alone use without a controller. Default values can be restored at any time, clearing the internal memory back to the standard values.

The LDS-610 dimmer is designed for use with conventional incandescent fixtures. Highly inductive loads, such as low voltage devices using a step-down transformer, may require an additional load to be connected to the same circuit to operate properly.

Florescent fixtures with two wire dimmable ballasts can be used with the LDS-610 dimmer. For operating florescent fixtures, see the section regarding Front Panel Controls.

2 Models offered

2.1 The Leprecon LDS-610 dimmer will be available in several configurations.

Three types of load connectors are available for connecting dimmer circuits to fixtures, 20 amp Stage Pin, NEMA 5-15 duplex outlets, or L5-20 Twist receptacles.

Any of these models is available with two auxiliary power circuits, each with a capacity of 10 amps. This provides a convenient power source for color changers or other powered accessories. Auxiliary power is provided by NEMA 5-15 duplex outlets regardless of load connector type.

2.2 Optional Wireless DMX

Leprecon LDS-610 is available with wireless DMX capability. This system has been developed by Wireless Solutions and offers increased flexibility and convenience for setting up a DMX system. Leprecon W-DMX dimmers will be compatible with other W-DMX equipment that uses components from Wireless Systems.

When a LDS-610 is used in a wireless system, it converts the wireless signal to a conventional DMX signal. The DMX output of the wireless dimmer can be used to drive other conventional DMX receivers.

So, in a wireless system, one dimmer can be used to receive the signal from the transmitter and connect with DMX cable to up to 32 other standard DMX devices.

W-DMX dimmers are identical to the standard models, with these additions:

- Internal receiver card and power supply
- External antenna
- Switch and LED indicator for setting the communication link

Background Information

The W-DMX system uses a 2.4 GHz radio signal to transmit DMX data. Spread-spectrum transmission (AFHSS) technology prevents interference with the DMX signal from other radio devices.

Range for the W-DMX is approximately 2300 feet using the standard antenna with a clear line-of-sight. The signal will penetrate walls and other barriers, but the signal level will be reduced. Human bodies will block the signal, so it is best to locate the transmitter and receiver above audience areas.

W-DMX Link

The LDS-610 dimmer is designed to receive data from any of the W-DMX transmitters. A system is complete when the receiver is 'linked' to a specific transmitter. Establishing the 'link' allows many receivers to be controlled by a single transmitter, and also allows multiple transmitters to be used in the same area, each controlling specific receivers.

The LDS-610 dimmer center panel has two controls for setting up the W-DMX link.

The LED located on the center panel of the dimmer shows the status of the wireless link.

OFF – Dimmer is not linked to any transmitter. DMX cable input can be used.
ON – Dimmer is linked to a transmitter and receiving DMX data.
ON-short Blink off – Dimmer is linked to a transmitter but no data is being received.
ON/OFF flash – Dimmer was linked but connection was lost.

The push button switch below the LED (black) is used to unlink the receiver from the transmitter. To do this, press the switch and hold it down for four seconds. The LED will turn off, indicating that the link has been broken.

To establish a link to a specific transmitter:

1) Unlink the dimmer by pressing and holding the switch as described above. Verify that the LED is off.
2) Press the function switch on the TRANSMITTER for one second. The dimmer LED should light to indicate that it is now linked to the transmitter.

To unlink ALL dimmers from the transmitter:

1) Press and hold the function switch on the TRANSMITTER for four seconds. The status LED's of all dimmers previously linked to that transmitter will turn off.

More inf can be found in the manual for the specific W-DMX transmitter that you have in the system.

3 Specifications

3.1 Dimensions

The LDS-610 is built on an extruded aluminum chassis. The dimensions for the dimmer are as follows:

Length	76.2 inches
Width	5.75 inches
Depth	3.8 inches
Weight:	36 lbs

3.2 Power Connection

Unless otherwise indicated, your LDS-610 dimmer is designed for connection to standard US power systems, 120 VAC 60 Hz. Lamp connections must be 120 V devices only. Line voltages over 135 VAC will trigger the over-voltage protection circuit and shut off the dimmer pack.

The LDS-610 dimmer can be configured for use with single phase or three phase power systems. Power requirements are shown in the following table:

Model	LDS-610 SL	LDS-610 Duplex	LDS-610 SL-Aux	LDS-610 Duplex-Aux
Load connector per circuit	Two Stage Pin connectors	One 5-15 duplex	Two Stage Pin connectors	One 5-15 duplex
AUX power	No aux outlet	No aux outlet	Two aux duplex outlets	Two aux duplex outlets
Three Phase Power Requirements	20 amps per leg	20 amps per leg	30 amps per leg	30 amps per leg
Single phase power requirement	30 amps per leg	30 amps per leg	40 amps per leg	40 amps per leg
Order Number	90-06-0301	90-06-0303	90-06-0302	90-06-0304

3.3 Ambient Temperature

The LDS-610 dimmer is designed for use in a cool, ventilated area. Ambient air temperature must be less than 40 degrees Celsius, or about 104 degrees Fahrenheit. Temperatures in excess of this limit will cause an over temperature shutdown, indicated by 'Er01' on the display.

3.4 Power Capacity

The LDS-610 dimmer is a six circuit dimmer. Each circuit has a capacity of 1200 watts, and is protected with a thermal-magnetic circuit breaker.

LDS models with Aux power have an additional two non-dimmed convenience circuits. These can be used to power color changers, DMX buffers, or any other type of line-operated equipment. Each of the two duplex convenience outlets has a maximum load of 1200 watts, and the auxiliary outlets are also protected by a breaker.

3.5 Control input

The LDS-610 accepts DMX 512 1990 as specified by USITT. Reliable DMX systems require cable rated for high-speed data communication; for this reason the use of microphone cable is ***NOT*** acceptable. DMX rated cables are available pre-manufactured from your Leprecon dealer. For more information on the DMX standard and acceptable cable, see the Appendix at the end of this manual.

For convenience, DMX in and out connectors are provided on the LDS-610. This allows easy connection to additional dimmer packs. The DMX standard allows up to 32 dimmers to be connected to a single DMX controller.

For proper operation, it is recommended that the last dimmer in the system have a termination plug placed in the DMX Out connector. Termination plugs can be purchased, or easily built by installing a 120 ohm resistor between pins 2 and 3 of the 5 pin XLR.

4 Installation

4.1 Mounting

The LD-610 dimmer is passively cooled, using no internal fans. The heat generated by the dimmer is dissipated by the extruded metal chassis. For proper cooling, the dimmer must be mounted so that air is free to circulate around the dimmer. The ambient air temperature surrounding the dimmer must be less than 100 degrees Fahrenheit.

The LDS dimmer has mounting brackets fitted at each end. These brackets can be rotated to three different positions for securing the dimmer. The dimmer can be attached to a pipe using standard pipe clamps, suspended from threaded rod, or bolted directly to a beam. Keep in mind that the mounting method must be sufficient to support the weight of the dimmer, 36 lbs.

4.2 LDS Options

To make mounting the LDS dimmer easier, we offer three types of accessory mounting kits. Contact your Leprecon dealer or check our website for more information about these kits.

- C Clamp - This kits include all parts needed to hang a single dimmer from a pipe using two standard C clamps and safety cables.
- Threaded Rod – Attach to 3/8 threaded rod, includes a mounting point for a batten below the dimmer for attaching fixtures.
- Double-pipe – Hangs the LDS dimmer from a pipe, and attaches a second pipe below the dimmer.

Instruction are included with each of the option kits that explain the proper use with the LDS dimmer.

4.3 Power Connection

The LDS dimmer provides a hole in the right end plate that is sized for standard ¾ inch EMT conduit fittings. See the power requirements chart in section 2 for determining correct wire size and over-current protection needed for your application.

A plastic cap is installed in the end plate at the factory, and is to be removed at the time of installation.

Inside the LDS-610 dimmer at the right end is the connection terminal block. There is a four position terminal block and a ground lug for power connection. If the power supply is three phase, connect the hot conductors to the red, black and blue lugs. The white lug is for the neutral connection, and the copper ground lug is the safety ground connection.

If the dimmer is to be used with single phase power, connect the hot leads only to the black and red terminals. Check the phase switch setting as described below.

4.4 Optional power cable

Leprecon offers pre-assembled cord assemblies for the LDS, consisting of 10-5 jacketed cable with 30 Amp twist plug installed. Contact your dealer for price and availability of the power cord option.

4.5 Single Phase switch

The LDS-610 dimmer can be set in the field for either single phase or three phase power. To the left of the power inlet block is a toggle switch. The switch position marked '3' sets the dimmer for three phase power. Moving the switch to the '1' position configures the dimmer for balanced operation on single phase power.

Note: Changing the position of the Single Phase switch will change the current draw from the power source! Refer to the chart on page 4 to make sure that you have properly sized the power wiring for single phase use.

4.6 Load Connection

The LDS-610 dimmer is offered with three different load connectors. The options are 20 amp stage pin, Nema 5-15 duplex, or L5-20 Twist connector. Lamp loads are simply plugged directly into the dimmer. Maximum load capacity for each circuit is 1200 watts.

Each circuit is protected by a front-panel mounted thermal-magnetic breaker. Overload or shorted lamp loads will cause this breaker to trip. Check and remedy the cause of the overload before resetting the breaker.

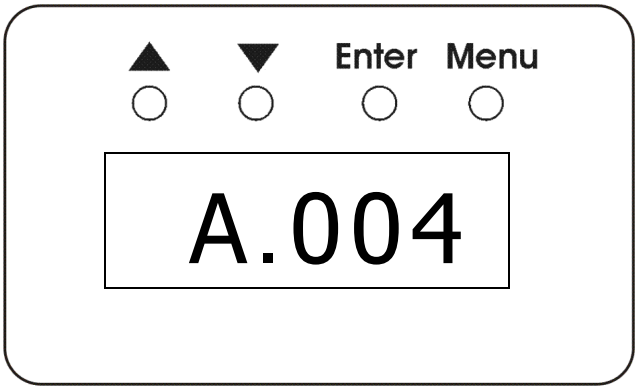
5 Front Panel Controls

The LDS-610 dimmer uses a 4 digit display and four entry switches to set pack functions, and display operating status. There are 5 basic menus that are used to set the dimmer operation.

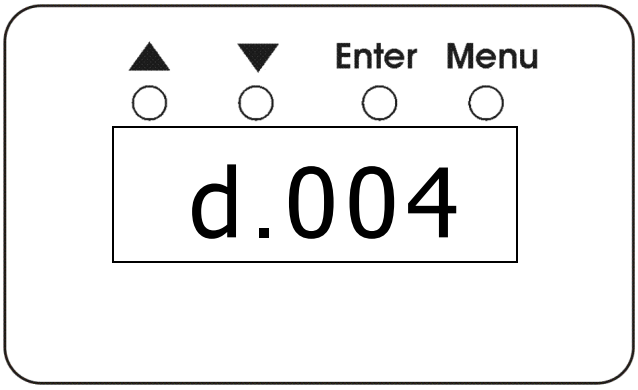
5.1 Address Menu

When the dimmer is first turned on, the display shows the starting channel address of the LDS-610. This is the DMX address that will control the first channel of the pack.

When there is no DMX input, the channel number is preceded by the letter A for address:



When valid DMX is detected, the letter ‘A’ is replaced with the letter ‘d’ for DMX:

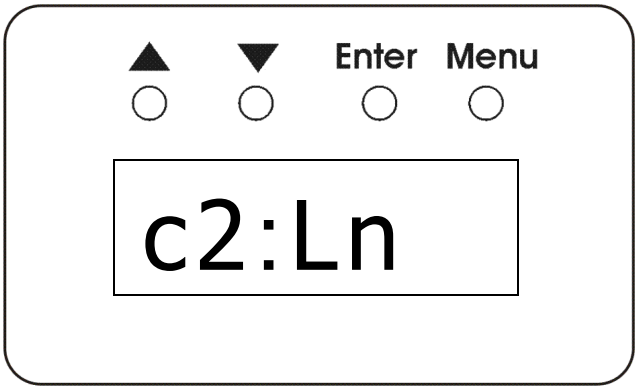


The UP/DOWN keys change the value for the start address. The LDS-610 uses the changed value immediately and permanently saves it after 10 seconds or if the Enter or Menu key is pressed.

After power on, the LDS-610 remains in the Address Menu in its simple interface mode. To go to any other menu requires the user to hold the MENU key for about 5 seconds.

5.2 Channel Mode Menu

The Channel Mode Menu allows setting one of four basic modes for each dimmer channel. The Channel mode is indicated by the letter ‘c’ in the display:



Set the mode for the displayed channel by pressing the UP/DOWN keys. The choices for channel modes are:

Mode	Description
Ln	Linear output. Standard dimmer channel.
Nd	Non-dim. Fader input above 60% turns on channel to 100%. Input below 40% turns off channel.
FL	Florescent output. Dimmer does not begin to turn on until 20%.
00-FF	Fixed output level. Values are 0, 10-99 and FF. FF is 100% output.

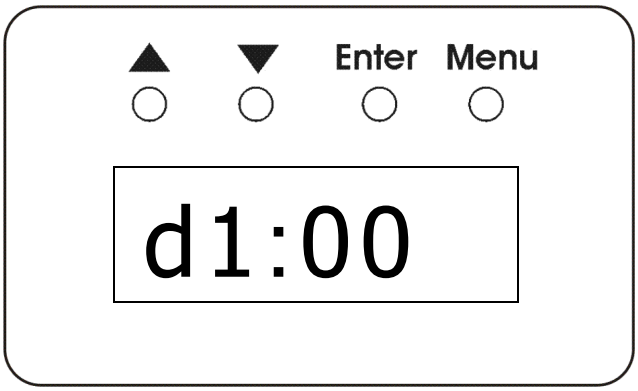
After changing the mode the colon will blink to indicate new data has been entered. Press the ENTER key saves the change, and advance to the next channel.

The LDS-610 returns to the Address Menu automatically after 4 seconds if no keys are pressed in the Mode Menu.

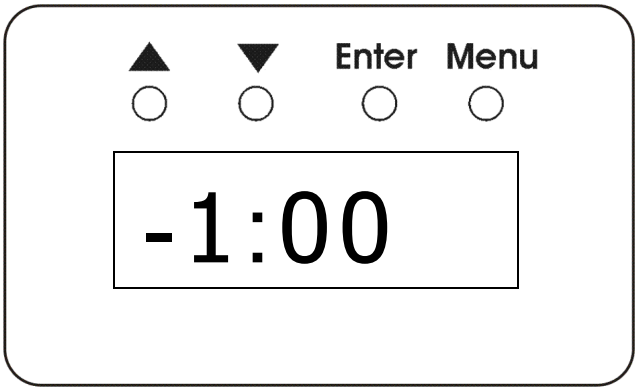
5.3 Status Menu

When the LDS-610 is in the Channel mode, pressing the 'MENU' switch again will change the dimmer display to the Status mode. When Status mode starts, the state of each channel will be shown in sequence, with the display cycling from Channel 1 to Channel 6, then automatically cycle back to channel 1. This automatic cycling is indicated by the flashing colon.

The Status Mode first displays the current input state of the dimmer channels 1-6. If valid DMX is present, the letter 'd' is displayed, followed by the DMX value for the channel:



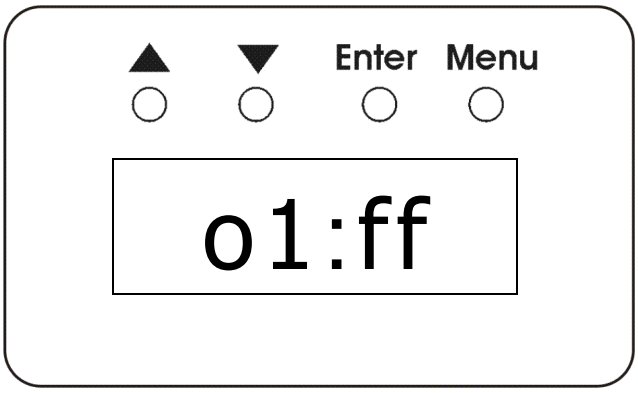
If there is no DMX present, the 'd' letter will disappear, and a '-' will be shown instead:



Once the input levels for all dimmer channels have been shown, the display will then indicate the output level for each channel. This is indicated by the letter 'o' in the display, followed by channel number, followed by output level. Output will be shown as a percentage, with 100% indicated by the letters 'FF'

Pressing the ENTER, UP or DOWN keys stops the automatic cycling. Pressing MENU turns automatic cycling on and off.

If the auto cycle is turned off, the display shows information for a new channel when the UP or DOWN keys are pressed. The colon is steady in manual mode.



If a channel has been set to a fixed level in the Channel menu, the output status will reflect that level. In this case, the input for channel 1 could be zero, but there could be a non-zero output level.

Status Letter	Description
–	No input detected
d	DMX is input source
o	Output level
F	Output Fault – Overtemp or Overvoltage shutdown

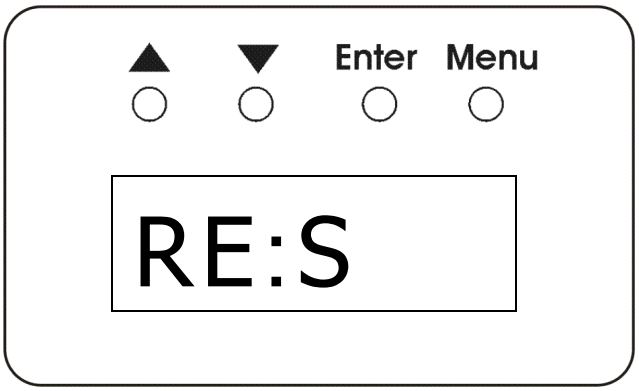
5.4 Software Version display

If you press the Menu button while in the status display, the LDS will indicate the currently installed software version. The letter U is shown, along with the three digit software version.

5.5 Hard Reset

Pressing the Menu button again will display the Reset option. Resetting the dimmer will return all features to the factory defaults. All six channel modes will be set to Ln (linear output), and the start address will be set to 001.

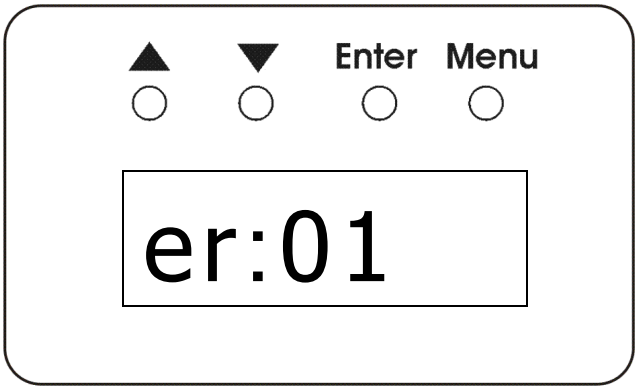
The Reset mode is indicated on the display as shown below:



To reset the LDS dimmer, press and hold the Enter button. The colon will begin to flash. After about 5 seconds, the flashing will stop, and the dimmer will reset to Address mode.

6 Error conditions

The LDS-610 will protect itself if the line voltage or operating temperature exceeds safe limits. In these cases, the dimmer will turn off all channels, and display an error message on the display:



Error 01 is displayed for an over-temperature condition.
Error 02 is displayed for an over-voltage condition.

The dimmer will return to normal operation once the fault is corrected.

NOTE: Extended operation with over-voltage applied can cause damage to the dimmer power supply.

7 Service policy

The LDS-610 is designed for a long, trouble free life. If you suspect that you have a dimmer problem, the first step is to check all other system components and connections. The easiest test is to substitute a known good dimmer in place of the suspected unit. Make sure that the DMX start address is set to the same value.

Specific problems and solutions are listed below:

Problem	Indication	Solution
no power	breaker not lighted	check incoming power
No response to DMX	Display shows D, but no output	Level set in Channel menu. Clear dimmer and recheck.
Shorted load	breaker trips	repair instrument or cable
No DMX signal	Display shows A	Check cable and controller
SCR failure	Channel stuck at full	refer to service center
Over Temp	Error 02	Check airflow
Over Voltage	Error 01	Check power wiring
Overload	breaker trips	check wattage of loads

If a problem is verified in the dimmer pack, contact your Leprecon dealer for service. Because of the high voltages present inside of the dimmer, it is important that all service be done only by qualified personnel. Substandard repairs can create a dangerous condition.

7.1 Warranty Information

For a period of two years from the date of sale, Leprecon LLC will replace any defective parts and will repair any defective module returned to the factory prepaid, without charge for parts or labor. Damage caused by misuse, incorrect line voltage or connection to shorted loads is not covered under warranty.
Please consult your dealer for full warranty details.

The Leprecon service department may be reached at 810-231-9373 during business hours, or a message may be left after hours. Our fax number is 810-231-1631.

Our service department must first authorize any return to the factory. Do not return any equipment without calling for an authorization number.

8 DMX 512 Information

The following information is a summary of the USITT 1990 standard for dimmers and controllers. A complete copy may be obtained from:

USITT
10 W. 19th ST.
Suite 5A
New York, NY 10011-4206

Several web sites exist that have an abundance of information regarding DMX-512. As with any Internet information, consider the source.

The DMX 512 standard is designed as a simple, reliable system for connecting digital dimmers and controllers. The protocol allows up to 512 dimmers to be connected to a single control console. With 512 dimmers in a system, DMX 512 allows each dimmer level to be updated 44 times each second.

8.1 Connectors

The DMX standard specifies the use of 5 pin XLR connectors. DMX 512 currently uses 3 pins of the 5 pin connector. Pins 4 and 5 are reserved for future use. Some manufacturers are using these pins for communications back from the dimmer to the control console, or as a redundant data line.

The connectors to be used for DMX 512 are as follows:

Console end (transmitter)	Female 5 pin XLR
Dimmer end (receiver)	Male 5 pin XLR

Some manufacturers of XLR connectors are Switchcraft®, ITT Cannon®,, and Neutrik®,.

8.2 Cable type

Shielded twisted pair approved for EIA-422/EIA-485 use. Either one pair with shield or two pair with shield may be used. Examples of such cable are:

Single pair:	Belden®, 9841, Alpha 5271
Two pair:	Belden®, 9842, Alpha 5272

The Pin Designations for DMX 512 are as follows:

Pin 1	Signal common (cable shield)
Pin 2	Data 1-
Pin 3	Data 1+
Pin 4	Spare, optional Data 2-
Pin 5	Spare, optional Data 2+