

JANDS DD-8

O p t o - I s o l a t e d D M X S p l i t t e r



Operating Manual

Version 2.0

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1.0 Introduction

The JANDS DD-8 is a high quality 8 channel opto-isolating data splitter specifically designed for distributing one DMX-512 input signal to eight destinations. It is designed to perform two functions - to isolate faults, and to provide signal amplification where long cable runs are used.

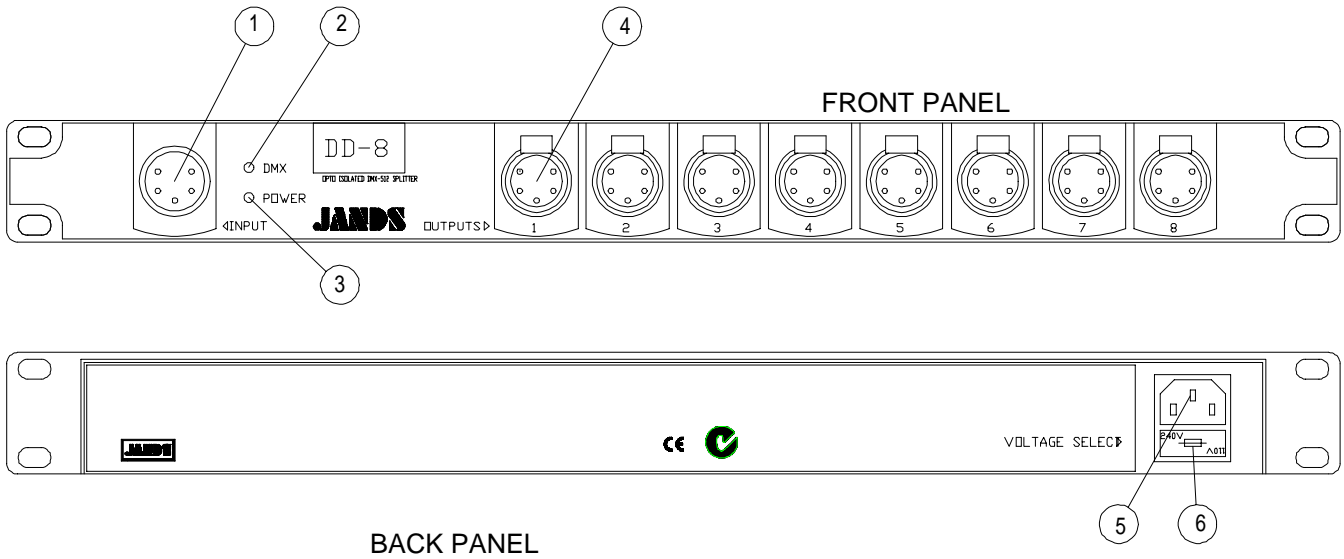
When a fault occurs, it is possible to get high voltages in the DMX cabling. Such voltages can propagate along the cable and damage all equipment connected to that cable. The DD-8 is designed to sever the physical link between elements of the DMX system, thereby isolating faults on one line from the rest of the system. The DD-8 is fully protected against internal damage from most such faults. Since these faults can occur in all systems, the DD-8 is equally suitable for all touring, theatre, exhibition and trade show applications. In addition, including the DD-8 in a DMX system makes fault finding relatively simple.

The DD-8 can also be used as a signal amplifier where extremely long cable runs are necessary, or can be used to drive more than the normal maximum of 32 devices from a console. It is recommended a DD-8 be used to isolate DMX segments that run to equipment that is powered from different supplies. Outdoor systems where the console runs from a separate supply to the dimmers are an example of such systems.

The DD-8 is designed to run from most mains power systems. It will accept an input voltage from 90 to 130V, or 190 to 265V. The input voltage is set by the user at the back panel.

The DD-8 is packaged in an all-steel enclosure and is designed to mount in a standard 19 inch rack. The DD-8 occupies one rack space.

2.0 Equipment Description



2.1 Physical layout

1. **DMX Input:** A standard 5 pin male AXR connector for DMX-512 signal input.
2. **DMX LED:** This indicator shows the presence of DMX signal.
3. **Power LED:** This indicator shows when mains power is applied to the DD-8.
4. **DMX Outputs:** A standard 5 pin AXR connector outputs opto-isolated DMX-512 signal to the DMX-512 receivers. The same signal appears on all eight outputs.
5. **Power input:** An IEC type inlet socket connects mains power to the DD-8.
6. **Fuse:** The position of the fuse holder selects the mains input voltage. Refer to Section 3 for details on setting the correct mains input voltage.

3.0 Getting Started

3.1 Setting the input voltage

Before applying any power it is important that the DD-8 be configured to match the incoming mains voltage. The fuse holder is marked with both “240V” and “110V” markings - the label that is the correct way up indicates which input voltage is selected. To change the input voltage, lever out the fuse holder with a flat blade screw driver and rotate it 180 degrees. Swap the fuses and re-insert the fuse holder.

Note that the fuse holder is permanently attached to the socket assembly and can only be removed about 20mm.

Note also that the rating of the fuse must be changed to match the input voltage. Refer to the specifications for the correct fuse rating.

3.2 Connecting power

Connect a standard IEC plug and cable to the DD-8 inlet socket. When power is applied the red **POWER** LED will light.

NOTE

The DD-8 must be connected to a 3 pin earthed power source. Use of 2 pin (non-earthed) power sources will reduce the ability of the DD-8 to protect against high voltage shield faults.

3.3 Connecting DMX-512 input

The DD-8 input signal should conform to the USITT DMX-512 (1990) specification. The DMX-512 input connects to the INPUT socket on the front panel. The green **DMX** LED will light if there is signal present. See Appendix A for connector wiring details.

3.4 Connecting DMX-512 outputs

The DD-8 output signals are an amplified copy of the input signal. Connect the outputs to the DMX-512 receiving devices as required. See Appendix A for connector wiring details.

3.5 Power-up sequence

When powering up, a system should be powered up in the order it appears in the DMX-512 system, starting from the console and proceeding to any splitters or softpatches, and finally to the dimmers or fixtures. The DD-8 should be powered up in its appropriate position in the system.

This procedure minimises the risk of producing the lighting equivalent of an audio “thump” and prevents damage to lamps, dimmers, and other controlled devices.

Use the reverse procedure when powering down.

4.0 Operating Notes

A DD-8 should be connected where its fault protection/isolation or fan out capability can be most effective. See Figure 4.1 below. Suggested positions include:

1. Between pieces of equipment that run from different power sources. Examples of different power sources include:
 - Stadium type shows where the dimmers are distributed in groups around the stadium and each group is run from a local sub-board, transformer, or sub station. In this case a separate DD-8 output should be used to drive separate dimmer groups via individual cables. If this is not practical then a DD-8 should be placed at each dimmer group, to isolate that group.
 - Outdoor shows where the console is run from a different power supply to the dimmers. In this case the DD-8 should be placed just before the input to the first receiving device on the line.
2. At the input to a multi-piece equipment rack. If it is necessary to have complete protection and isolation in a system then each receiving device must be connected to an individual DD-8 output. If 12 channel dimmers in racks of six are used, then one DD-8 per rack could isolate all of the dimmer inputs, provide an isolated output for the next rack's DD-8, and still have one spare output.
3. To drive a DMX-512 control signal in multiple directions from a centre hub point. A DD-8 mounted in a truss can be used to provide drive signals for moving lights in separate segments of the truss.

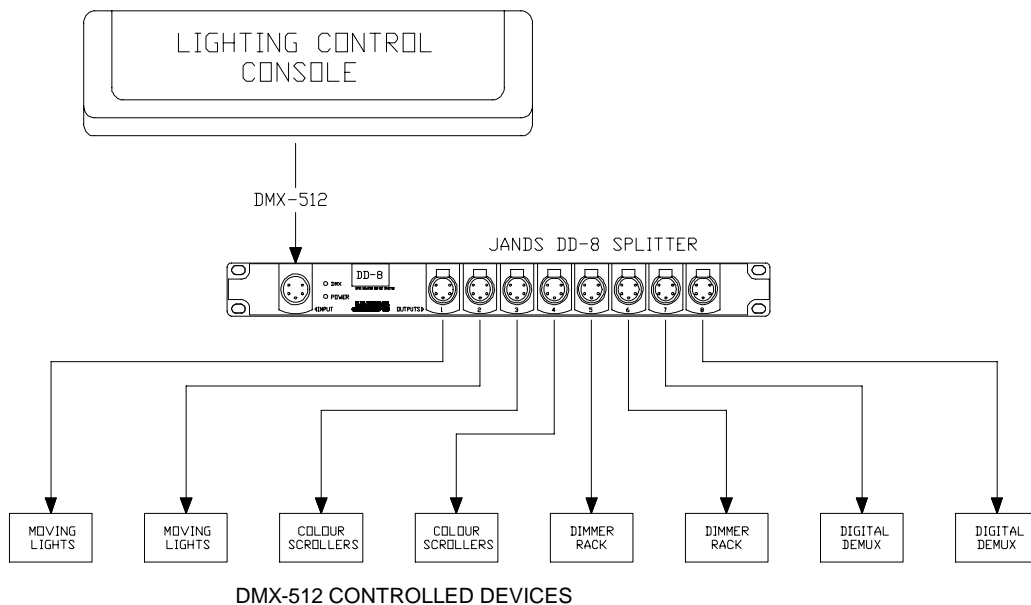


Fig. 4.1 Typical JANDS DD-8 system configuration

5.0 Technical Aspects

5.1 Circuit Description

The DD-8 copies the incoming DMX-512 signal into eight identical opto-isolated outputs. A separate power supply is provided for the input and each output to maintain complete isolation. Refer to Figure 2.1 (over).

The input signal is received by a standard RS485 line receiver (IC1) via protection components PTC1, PTC2, MOV1, MOV2. Note the input shield is lifted from chassis via a parallel RC network R1, C1. R4 terminates the incoming DMX line.

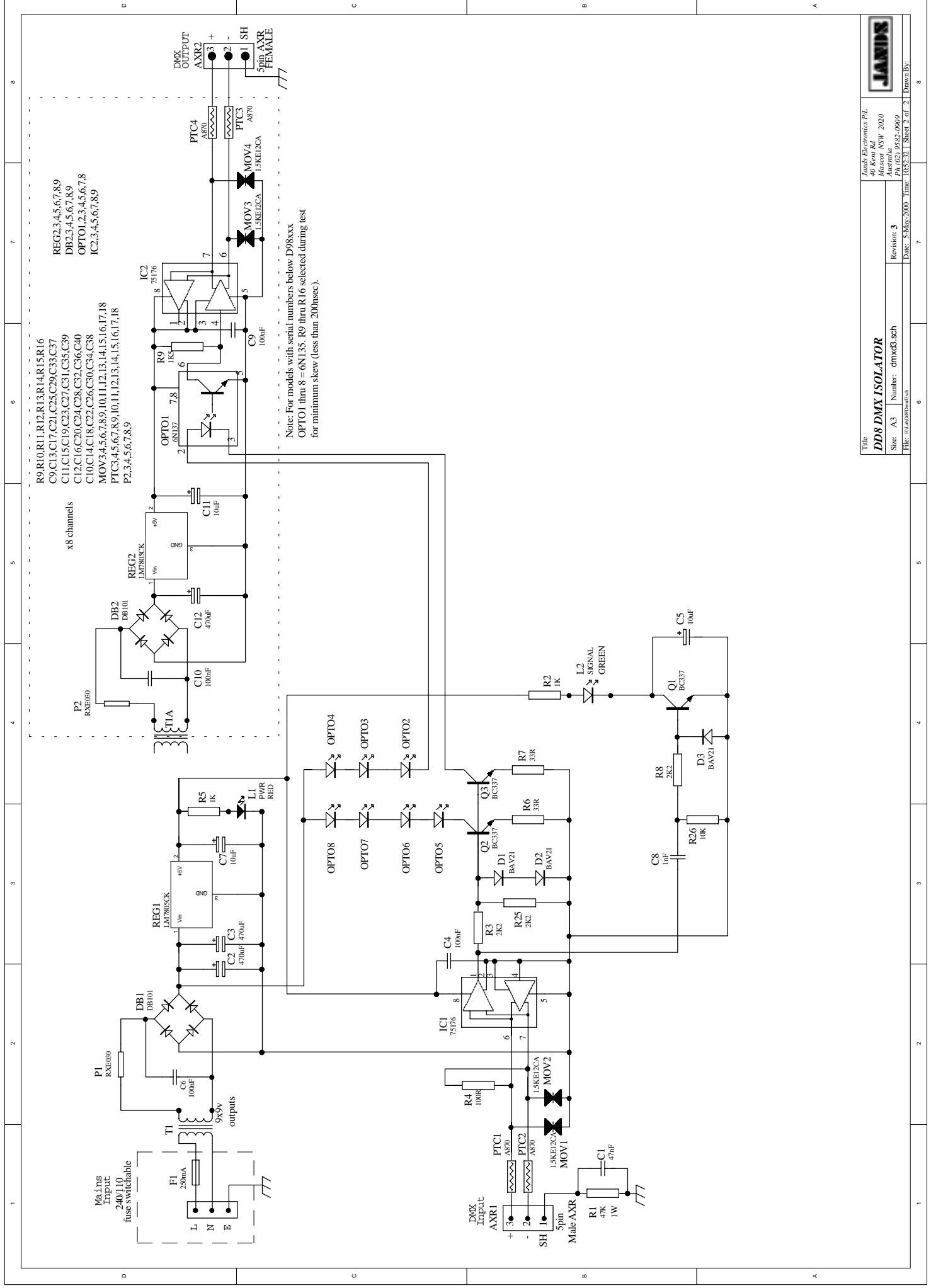
The output of IC1 drives the opto-isolator LEDs. These LEDs are arranged in two series strings of four, and are driven via 20mA current sink transistors Q2 and Q3. The use of current sinks ensures power supply voltage fluctuations do not affect the opto drive current.

The receiver output also drives the signal indicator LED L2 via positive edge detector network C8, R26, R8, D3, transistor driver Q1, and pulse lengthener C5. This circuit will respond to signals with high repetition rates, and may light in the presence of non DMX signals.

Eight identical output circuits drive the DMX outputs. The opto-transistor and pull-up resistor R9 etc drive the DMX line driver directly. The line driver output is protected by PTC3, PTC4, MOV3, MOV4, etc. The output shields are tied hard to the DD-8 chassis.

The DD-8 uses a custom-wound toroidal power transformer with nine separate but identical secondary windings. Each winding is used to provide an isolated linear power supply for one of the output circuits or the input circuit. A polyswitch protects each output from local overloads.

The primary of the transformer is wound with a combined 240/110V winding, and the orientation of the mains fuse determines which winding is connected to the mains input. Note that when the mains voltage is changed, a fuse with the correct rating must be used.

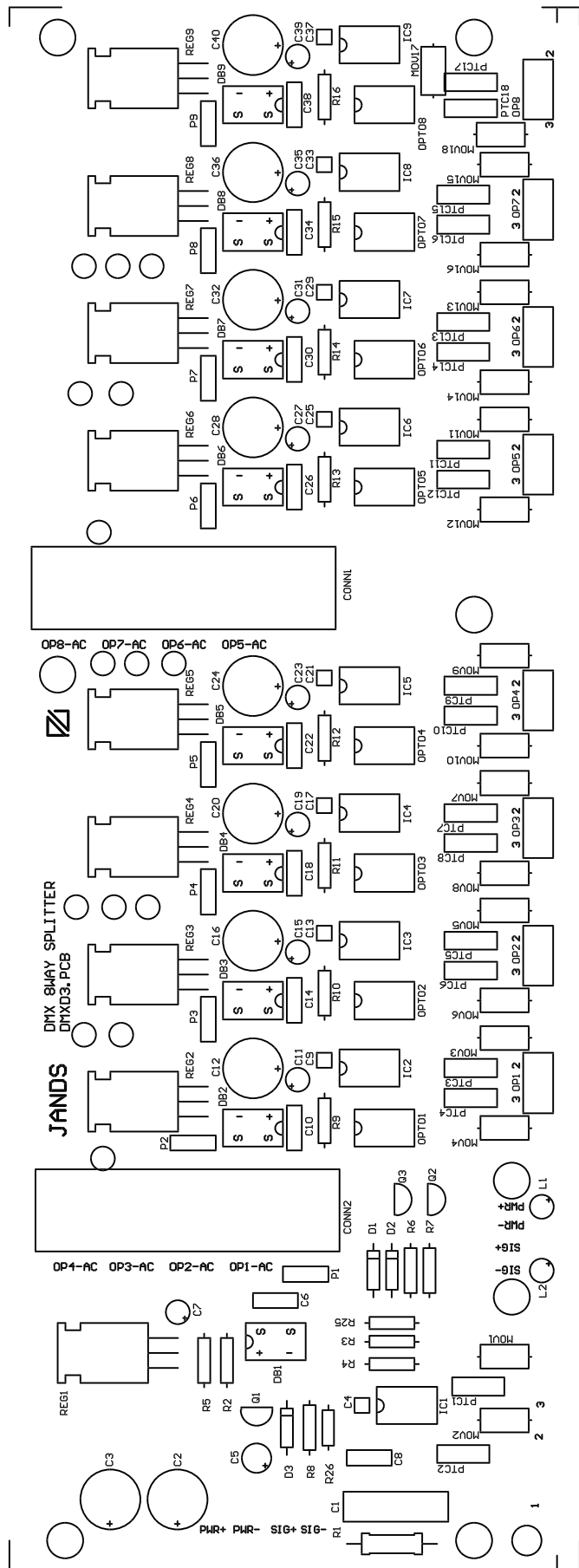


REG2,3,4,5,6,7,8,9
 DB2,3,4,5,6,7,8,9
 OPTO1,2,3,4,5,6,7,8
 IC2,3,4,5,6,7,8,9

R9,R10,R11,R12,R13,R14,R15,R16
 C9,C13,C17,C21,C25,C29,C33,C37
 C11,C15,C19,C23,C27,C31,C35,C39
 C12,C16,C20,C24,C28,C32,C36,C40
 C10,C14,C18,C22,C26,C30,C34,C38
 MOV3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
 PTC3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
 P2,3,4,5,6,7,8,9

x8 channels

Note: For models with serial numbers below D98xxx
 OPTO1 thru 8 = 6N135, R9 thru R16 selected during test
 for minimum skew (less than 200hsec).



5.2 Fault Finding Table

Fault Symptom	Possible Cause	Remedy
No power indication	Blown Fuse	Replace fuse
	Mains disconnected	Reconnect
	Ambient temperature too high	Reduce ambient temperature
No DMX signal indication	Input cable fault	Replace cable
	DMX source fault	Repair source
No DMX output - One output	Faulty output cabling	Replace cable
	Faulty receiving equipment	Replace faulty receiver
	Control channels incorrect	Check source patch settings
		Check receiver address settings
	Ambient temperature too high	Reduce ambient temperature
Faulty DD-8 output	Swap cabling to another output	
No DMX output - All outputs	Faulty input cabling	Replace cable
	DMX source fault	Repair source
	Ambient temperature too high	Reduce ambient temperature
	Control channels incorrect	Check source patch settings
		Check receiver address settings

5.3 Miscellaneous Notes

- The protection circuitry will protect the DD-8 DMX line receiver/drivers against damage from most faults. However it is possible that extremely high fault voltages or spikes may damage the circuitry. If damage does occur it is important to re-route or repair the DMX cables as appropriate before re-powering the unit. Note that the protection circuitry may take up to a minute to reset after a fault has occurred.
- The internal linear power supplies are protected from faults by polyswitches. These devices become more sensitive to overload at elevated temperatures, and when tripped the unit should be switched off to enable them to reset. Allow one minute for these devices to reset once the power has been removed.
- The DD-8 must be connected to a 3-pin earthed power source. Use of two pin power sources will reduce the ability of the DD-8 to protect against high voltage shield faults.

6.0 Installation

The DD-8 is designed for mounting in standard 19 inch equipment racks. Adequate ventilation should be provided around the top of the chassis, however no blank spaces are required above or below the DD-8 specifically for ventilation of this device. Note that such spaces may be necessary to prevent the ambient temperature from rising above the maximum if other heat producing devices are mounted in the same rack.

No rear mounting is necessary due to the low weight of the unit.

7.0 Maintenance

WARNING

DO NOT ALLOW THE ENTRY OF LIQUIDS OF ANY SORT INTO THE DD-8.

With care, the DD-8 will require little maintenance. If the lexan panels require cleaning, wipe with a mild detergent on a damp soft cloth.

DO NOT spray liquids onto the panels.

DO NOT use solvents for cleaning the panels.

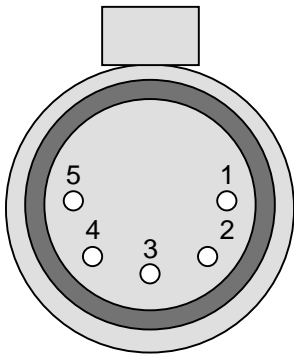
8.0 Technical Specifications

JANDS DD-8 DMX SPLITTER SPECIFICATIONS	
Mains Supply:	90-130V AC, 190-265V AC, 47-53Hz, fully earthed
Fuse:	110V - 1A, 240V-0.5A , M205 delay type
Power consumption:	50VA maximum
Operating Temperature:	45°C maximum ambient
Inputs:	1
DMX Termination:	100 Ohm
Outputs:	8
Isolation - input to any output:	500VAC
Isolation - between outputs:	500VAC
Protection - between input pins:	250VAC
Protection - from input to earth:	250VAC
Protection - between output pins:	250VAC
Protection - from output to earth:	250VAC
Construction:	Zinc plated all-steel chassis
Dimensions:	D: 120mm W: 480mm H: 44mm
Weight:	3kg
Physical protection rating:	IP20
Rack mounting requirements:	1 x 19" rack space / standard spacing for mounting holes No ventilation requirements No blank spaces required between units Power inlet at rear left (looking from front of unit) Power access required to replace mains fuse

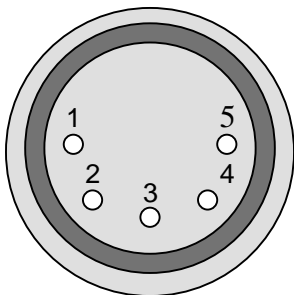
Appendix A Connector Pinouts

DMX connector pin-outs

PIN No	CONNECTION (DMX IN)	CONNECTION (DMX OUTPUT)
1	RC NETWORK TO CHASSIS	CHASSIS
2	IN-	OUT-
3	IN+	OUT+
4	NC	NC
5	NC	NC



OUTPUT DMX CONNECTOR



INPUT DMX CONNECTOR

⌘ MANUAL ENDS ⌘



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