

DD6-2

Opto-Isolated DMX Splitter



Operating Manual

Version 1



EMC COMPLIANCE



This product is approved for use in Europe and Australia/New Zealand and conforms to the following standards:

European Norms
EN 55103-1
EN 55103-2
EN 60065

To ensure continued compliance with EMC Directive 89/336 and the Australian Radiocommunications Act 1992, use only high quality data cables with continuous shield, and connectors with conductive backshells. Examples of such cables are:

DMX: Belden 8102 100% Aluminium foil screen, 65% Copper braid.

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Disconnect power when not in use.

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1.0 Introduction

The JANDS DD6-2 is a high quality 8 channel opto-isolating data splitter specifically designed for distributing one DMX-512 input signal to eight separate destinations. Six of the eight output channels conform to the 5-pin USITT DMX-512 (1990) specification, while the other two outputs utilise 3-pin connectors to drive non-standard devices. An additional THRU connection can be used to provide control signal to other devices that need to have DMX signal maintained if power to this DD6-2 is disconnected.

The DD6-2 is designed to perform several functions:

- to isolate faults
- to increase the drive (or fan-out) capability of a DMX source
- to create a central “star” drive point
- to isolate equipment powered from different supplies
- 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 DD6-2 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 DD6-2 is fully protected against internal damage from most such faults. Since these faults can occur in all systems, the DD6-2 is equally suitable for all touring, theatre, exhibition and trade show applications. In addition, including the DD6-2 in a DMX system can greatly simplify fault finding.

The DD6-2 can be used to increase the normal maximum of 32 DMX devices being driven from a console. Each of the eight outputs can also drive up to 32 devices, giving a fan-out of 256 devices.

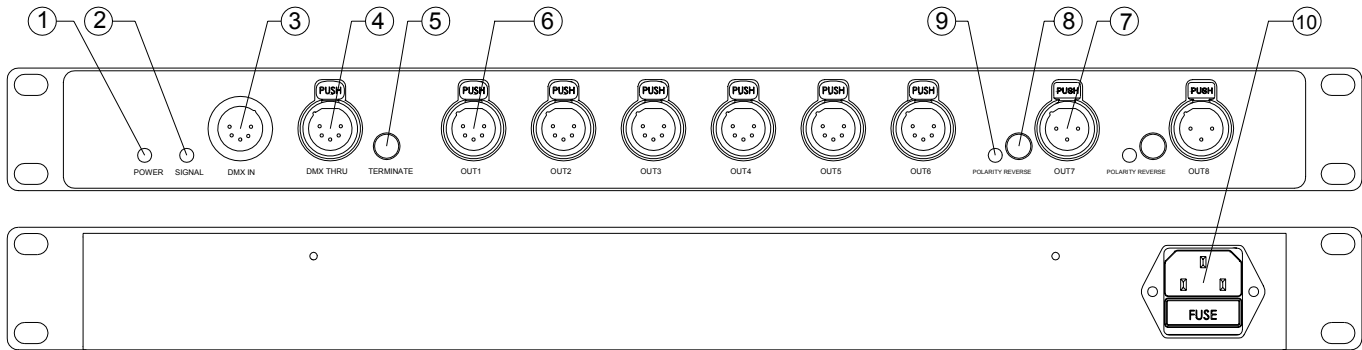
It is recommended that a DD6-2 be used to isolate DMX segments that run to equipment that is powered from different supplies. Outdoor systems where the console runs from a separate supply to the dimmers are an example of such systems.

The DD6-2 can also be used as a signal amplifier where extremely long cable runs are necessary.

The DD6-2 features a universal power supply and will accept mains input voltages from 90V to 265V AC.

The DD6-2 is packaged in an steel chassis with aluminium facia and is designed to occupy one rack space of a standard 19 inch rack.

2.0 Equipment Description



2.1 Physical layout

1. **Signal LED:** This indicator shows the presence of DMX-512 signal.
2. **Power LED:** This indicator shows when mains power is applied to the DD6-2.
3. **DMX In:** A standard 5 pin male AXR connector for DMX-512 signal input.
4. **DMX Thru:** A standard 5 pin female AXR connector for linking DMX-512 signal to other devices that must remain active if power is disconnected to this DD6-2.
5. **Terminate Switch:** This switch provides termination for the end of the DMX line. When pushed in, the line is terminated and the DMX THRU output is disconnected.
6. **5-pin DMX Outputs:** Six standard 5-pin AXR connectors output separately opto-isolated DMX-512 signal to external DMX-512 devices. The signal appearing at all six outputs is identical to the input signal.
7. **3-pin DMX Outputs:** Two standard 3-pin AXR connectors output separately opto-isolated DMX-512 signal to external DMX-512 devices.
8. **Phase Reverse Switch:** The polarity of either of the 3-pin output signals can be inverted to drive devices with non-standard pin connections.
9. **Phase Reverse LED:** This indicator shows when the polarity of a 3-pin output signal is inverted.
10. **Power input:** A fused IEC type inlet socket connects mains power to the DD6-2.

3.0 Getting Started

3.1 Power-up sequence

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 DD6-2 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”.

Use the reverse procedure when powering down.

3.2 Connecting power

Connect a standard IEC plug and power cable to the DD6-2 power socket. When power is applied the Power LED will light.

NOTE

The DD6-2 must be connected to a 3 pin earthed power source. Use of 2 pin (non-earthed) power sources will reduce the ability of the DD6-2 to protect against high voltage shield faults.

3.3 Connecting DMX-512 input

The DD6-2 input signal should conform to the USITT DMX-512 (1990) specification. The DMX-512 signal connects to the DMX IN socket on the front panel. The Signal LED will light if there is DMX signal present. See Appendix A for connector wiring details.

3.4 Connecting DMX-512 thru

The DMX-512 signal can be linked directly to another device by running a cable from the DMX Thru connector on the DD6-2 to the DMX input of the next device. Up to 32 devices may be linked in this way.

3.5 Connecting DMX-512 outputs

The DD6-2 output signals are an isolated and amplified copy of the input signal. Connect the outputs to the DMX-512 receiving devices as required. See Appendix A for connector wiring details.

3.6 Terminating DMX-512 signals

For reliable operation, the DMX-512 signal must be terminated at the last device in the signal chain. The DD6-2 has a termination switch on the front panel for this purpose. When pushed in, the line is terminated and the DMX Thru output is disconnected.

4.0 Operating Notes

A DD6-2 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 each output of a DD6-2 located at the console should be used to drive separate dimmer groups via individual cables. If this is not practical then a DD6-2 should be placed at each dimmer group, to isolate that group from the single DMX run.
 - Outdoor shows where the console is run from a different power supply to the dimmers. In this case the DD6-2 should be operated from the same power as the control console.
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 DD6-2 output. If dimmer packs in racks of five are used, then one DD6-2 per rack could isolate all of the dimmer inputs, provide an isolated output for the next rack's DD6-2, and still have two 3-pin outputs available for moving lights.
3. To drive a DMX-512 control signal in multiple directions from a central point. A DD6-2 mounted in a truss can be used to provide drive signals for moving lights in separate segments of the truss.

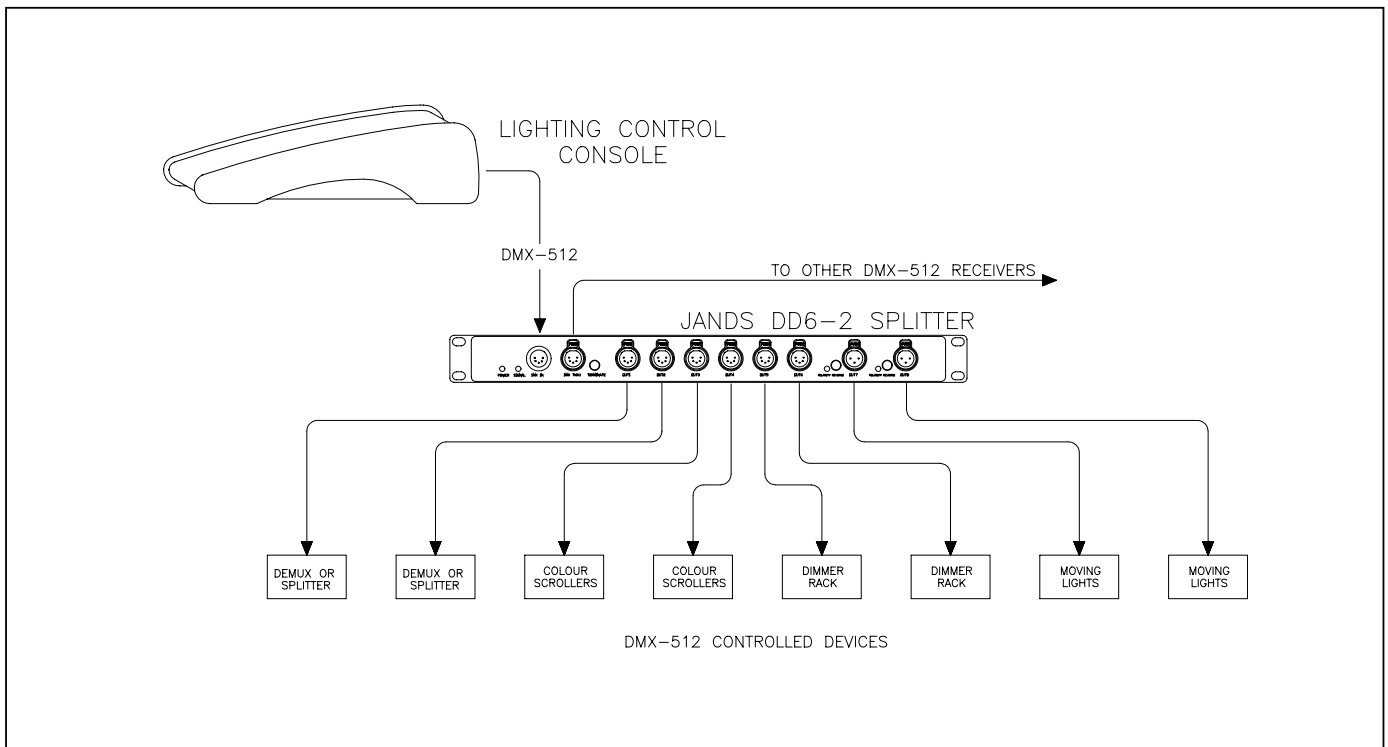


Fig. 4.1 Typical JANDS DD6-2 system configuration

5.0 Technical

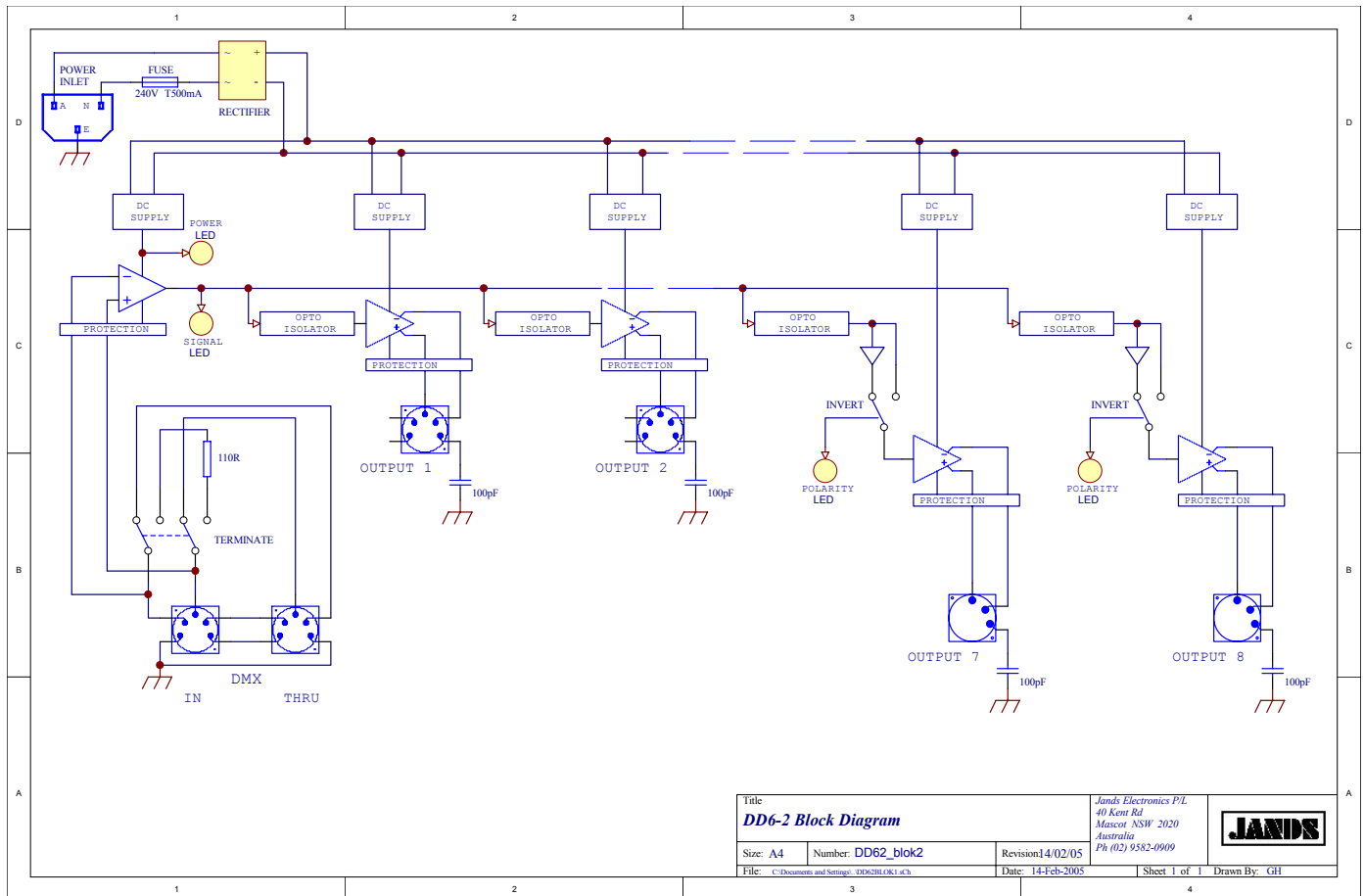
5.1 Circuit Description

The DD6-2 copies the incoming DMX-512 signal into eight separate opto-isolated outputs. A separate power supply is provided for the input and each output to maintain complete isolation.

The two 3-pin outputs contain an inverter circuit to perform a phase reversal when necessary.

Refer to Figure 2.1

FIG. 2.1 DD6-2 BLOCK DIAGRAM



5.2 Fault Finding Table

Fault Symptom	Possible Cause	Remedy
No power indication	Blown Fuse	Replace fuse
	Mains disconnected	Reconnect mains power
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
Faulty DD6-2 output	Swap cabling to another output	
No DMX output - All outputs	Faulty input cabling	Replace cable
	DMX source fault	Repair source
	Control channels incorrect	Check source patch settings
		Check receiver address settings
Faulty DD6-2	Repair/replace DD6-2	
Receiving device – incorrect operation	Output signal is incorrect phase on 3-pin connector	Press Polarity Reverse switch

5.3 Miscellaneous Notes

- The protection circuitry will protect the DD6-2 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 DD6-2 must be connected to a 3-pin earthed power source. Use of two pin power sources will reduce the ability of the DD6-2 to protect against high voltage shield faults.

6.0 Installation

The DD6-2 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 DD6-2 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

<p style="text-align: center;">WARNING</p>

<p style="text-align: center;">DO NOT ALLOW THE ENTRY OF LIQUIDS OF ANY SORT INTO THE DD6-2.</p>

With care, the DD6-2 will require little maintenance. If the lexan panel requires 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 DD6-2 DMX SPLITTER SPECIFICATIONS	
Mains Supply:	90-265V AC, 47-53Hz, fully earthed
Fuse:	0.5A, M205 delay type
Power consumption:	10VA maximum
Operating Temperature:	40°C maximum ambient
Inputs:	1
Thru:	1
DMX Termination:	110 Ohm
Outputs (5-pin):	6
Outputs (3-pin):	2
Isolation - input to any iso output:	500VAC
Isolation - between iso 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, aluminium front panel
Dimensions:	D: 190mm W: 482mm H: 44mm
Weight:	2.8 kg
Physical protection rating:	IP20
Rack mounting requirements:	1 x 19" rack space / standard spacing for mounting holes 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

PIN No	DMX IN	DMX THRU	DMX OUTPUT
1	SHIELD/CHASSIS	SHIELD/CHASSIS	SHIELD
2	IN-	OUT-	OUT-
3	IN+	OUT+	OUT+
4	Spare +	Spare +	N/C
5	Spare -	Spare -	N/C