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LSC MDR DMX-RDM Data Splitter User Manual

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INTRODUCTION

Overview

The comprehensive range of MDR professional DMX512/RDM data splitters deliver industry best protection, providing correct DMX512 earth isolation and data integrity. What else would you expect from the company who helped write the DMX512 specification in 1986 and has been releasing world-first DMX512-based products ever since. LSC has always been at the forefront of DMX512 communication for the entertainment industry.

As of February 2021, all MDR models are supplied with RDM capability as standard. Prior to February 2021, RDM

capability was an option for MDR splitters. The RDM option can still be retro fitted to older MDR splitters. Contact your LSC agent for details on how to purchase and install the RDM option.

Models

The MDR range encompasses 19" rackmount models with either 10 or 5 DMX outputs and a portable 5 DMX output version that can be either truss mounted or free standing. A choice of DMX and power connectors are available as listed below and detailed in section **5**

Models	Input/Output connectors	Features
MDRX	5-pin XLR or 3-pin XLR	10 Outputs Rack Mount
MDRJ	RJ45 Ethercon	10 Outputs Rack Mount
MDRR	5-pin XLR or 3-pin XLR	5 Outputs Rack Mount
MDRT	5-pin XLR or 3-pin XLR	5 Outputs Truss Mount or Freestanding

Mounting and Connections

Rack Mount

MDRX, MDRR and MDRJ model splitters can be mounted in a standard 19 inch rack. They can also be placed on any flat surface.

Truss Mount

MDRT model splitters can be placed on any flat surface or can be mounted to a truss, handrails and pipes using either of two methods.

1. Two Velcro straps (supplied) can be looped through the end cavities of the plastic housing and wrapped around the truss or
2. A factory supplied option consisting of a metal bracket and fixing bolts that allows the splitter to have a coupler or hook clamp attached.

Supplied Velcro Straps

Optional clamp bracket
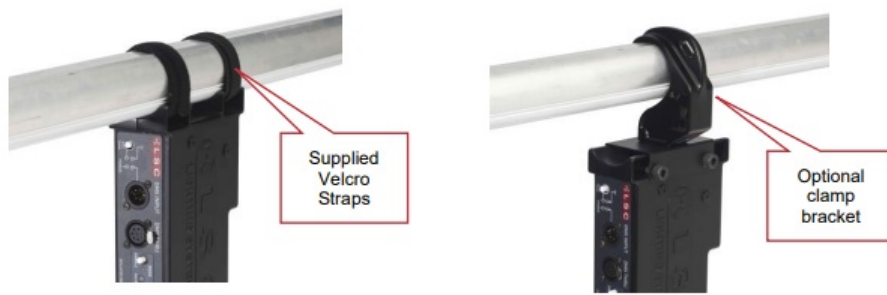
Note: All truss mounted or suspended splitters should also use a secondary form of attachment. It is recommended to feed a suitably rated safety wire or chain through the end cavities of the splitter and fasten around the pipe/truss/handrail.

Front Panel

DMX Present LED

RDM Enable Switch and LED

RDM Data LED

End of Line DMX512 Termination Switch and LED

Power LED

DMX Input

DMX Thru

DMX Data LED

DMX512 Outputs
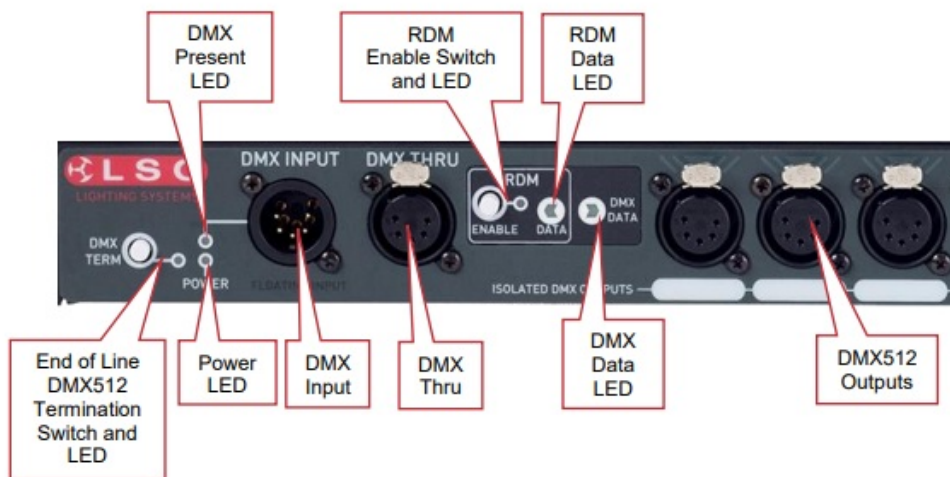
MDR DMX-RDM Splitter

Front Panel LED's	Indication
POWER	On when power is present
DMX INPUT	On when DMX data is present on the input
DMX TERM	On when the DMX TERM switch is ON
RDM ENABLE	On when RDM is ENABLED Flashes if RDM data overflows. See section **2.6**.
RDM DATA	On when RDM data passes back through the splitter from the responder to the controller
DMX DATA	On when data passes through the splitter from the controller to a responder.

DMX Connections

Connect the source of DMX into the DMX Input.
The end of the DMX line must always be terminated. The MDR range of splitters have an inbuilt termination that can be used to terminate the line.

- If the splitter is the last device at the end of the DMX512 cable, press the "DMX Term" switch to terminate the
  The DMX Term LED is lit.
- If the splitter is not the last device on the line and the DMX Thru connector is feeding another device, release
  the "DMX Term" The DMX Term LED is not lit.

Connect your DMX controlled devices to the DMX512 outputs. The end of each DMX line must also be terminated.
All DMX outputs are individually isolated from each other as well as from the input. Isolation is for both data and common connections and provides a galvanic barrier to 1500V. Outputs are EMI- filtered and current-limited to protect against short circuits

Power Connection

All MDR splitters have a built-in switch mode universal power supply (100-240V AC) with auto-frequency sensing (47-63Hz). The power input is either an IEC or powerCON connector.
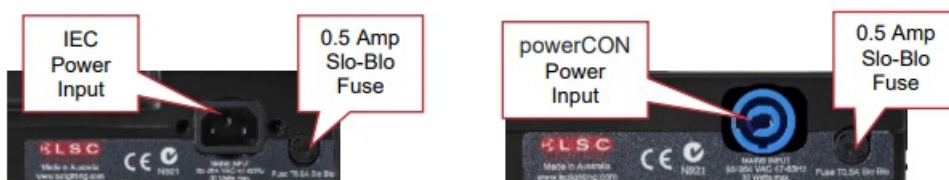
The MDR is not fitted with a power switch and uses the plug as the power disconnect device. Therefore, when the MDR is in use, the power plug must be easily accessible to enable disconnection.

RDM Operation

RDM allows RDM based controllers and devices to communicate with each other in bidirectional mode over the DMX cable, interleaved with the DMX512-A signal.
To enable the MDR splitter operate in RDM mode, press the "RDM Enable" switch.

If RDM data overflows, the RDM enable LED will begin flashing and the RDM function will be disabled automatically. If an RDM device causes the RDM data stream to overflow you must isolate the offending device from the network and reset the RDM module in the MDR splitter by switching the RDM enable switch OFF, then back ON.
Some older DMX-controlled equipment is not compatible with RDM data and could flash or flicker when RDM data is present. To overcome this problem the RDM data can be turned off using the "RDM Enable" switch.
Note: The MDR splitter is a 'transparent' device. It passes RDM data in both directions but is not an RDM responder itself. Therefore, it cannot be discovered by an RDM controller.

Connecting Multiple Splitters

When multiple splitters are required, it is best practise to use the THRU connector (rather than an output of a splitter) to feed the input of the next splitter. This is because the outputs of the splitter add a tiny time delay to the signal. This is of no consequence for DMX alone but when RDM is included in the DMX signal, the very tight timing of the RDM specification can be exceeded if multiple splitters are connected in series.
When multiple splitters are connected using the THRU connector there is no added delay and therefore no detrimental effect on the RDM signal.

Recommended method of cascading multiple DMX splitters

Connecting output to input is NOT recommended
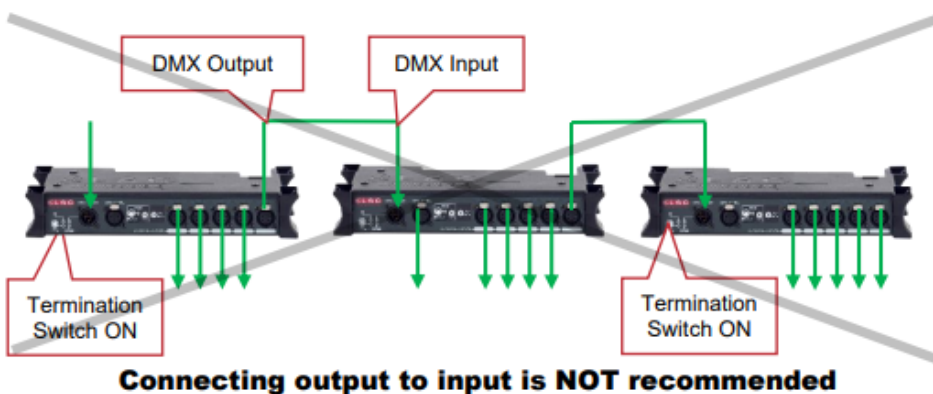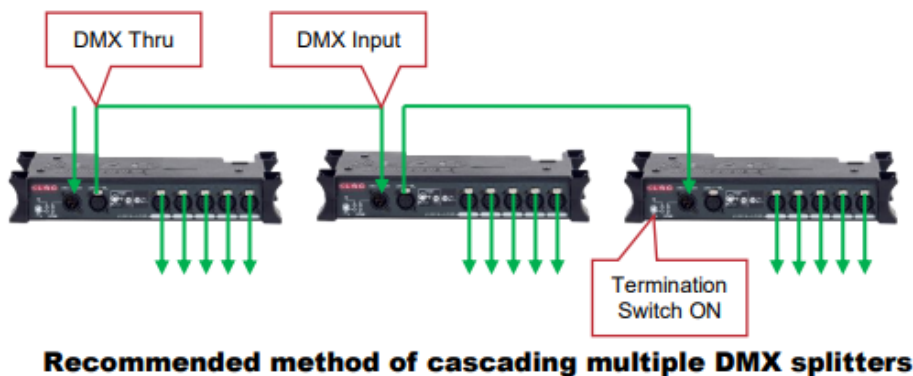
DMX512 Cables

When good quality data cables are used, DMX512 cable runs may be up to 1,000m in length. When several DMX streams are required (to feed different locations), DMX512 splitters must be used. These provide multiple isolated DMX512 output streams of the same input stream.

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 ohm, nominally 120 ohm
- 22AWG gauge for continuous lengths over 300m

Cat 5 UTP (Unshielded Twisted Pair) and STP (Shielded Twisted Pair) cable is acceptable. If you want to make your own cables, LSC recommends using Beldon 9842 (or equivalent).
The end of the DMX line must be terminated (120 Ω) to prevent the signal reflecting back up the line and causing possible errors.

DMX Pin Outs

RJ45	
Pin Number	**Function**
1	+ Data
2	– Data
3	Not Used
4	Not Used
5	Not Used
6	Not Used
7	Ground
8	Ground

5 pin XLR	
Pin Number	**Function**
1	Ground
2	– Data
3	+ Data
4	Not Used
5	Not Used

3 Pin XLR	
Pin Number	**Function**
1	Ground
2	– Data
3	+ Data

DMX512 Explained

DMX512-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 slot 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.

RDM Explained

RDM is an acronym for Remote Device Management, which is a protocol that overlays on the existing DMX512-A cable network using the same 3-pins of the XLR connector. The protocol has been released under the standard ANSI-E1.20-2006. Equipment connected to the DMX512-A network wishing to use the advantages of RDM, must

be RDM-compatible.

Unlike DMX512-A, RDM is bidirectional. This means that outgoing messages can be responded to and reported back to the originator. This can allow RDM controllers to interrogate, control and report on any RDM-enabled devices on the network. RDM can be used to:

- Change DMX start addresses
- Report faults
- Change fixture mode settings
- Request a list of fade curves available from a dimmer rack
- Report on lamp hours usage per fixture
- Report on the temperature of dimmers and other connected devices

RDM allows a lighting console to discover all the devices connected to its outputs and even how many DMX slots each item requires. This information could then be used to auto-patch the entire rig. The user settings of all the devices could be saved as part of the show file, so that when the show is reloaded into the console, the system could ensure that all devices are still connected and working, then check that the Pan invert settings and custom dimmer curves on certain devices have not changed. In the case of a faulty moving light, a new light could be connected and the user settings (for example, DMX address, mode, tilt invert) automatically uploaded to the new unit.

RDM is backwards compatible with existing DMX512 equipment, allowing non-RDM devices to be connected to the same cable as RDM devices. The non-RDM units, if fully conforming to the DMX512-A standard, will simply ignore all the RDM data. The only exception to the rule is DMX512-A data splitters. Non-RDM units will simply block (stop) all RDM data from any devices connected downstream of the DMX512-A splitter. Therefore, any lighting system using RDM must use RDM-enabled DMX512-A data splitters.

4 Wireless DMX512 Operation

Note: This option is no longer supported or supplied by LSC. This information is only supplied for earlier MDR splitters that were fitted with this option.

For full wireless DMX512-A operation, please refer the manufacturer's websites: Wireless Solutions (W-DMX)   **www.wirelessdmx.com**

City Theatrical (SHoW DMX)   **www.citytheatrical.com**

The wireless DMX512 modules supplied by LSC for the MDR range of splitters are modified receiver boards from the manufacturers listed above.

LSC do not supply wireless DMX512 transmitters. Please contact the above manufacturers for the appropriate transmitter to work with the MDR splitter.

The wireless DMX512 module can work as a sole DMX512-A input source for the splitter or as a backup source to the cable input, thus providing full redundancy for the DMX512-A cable input. If both wireless DMX512 and cable DMX512 are receiving data, the cable DMX512 input has priority. However, if there is a failure on the cable DMX512 input, the MDR splitter has an auto- switching feature that seamlessly switches the input priority to the Wireless input. When the failure on the cable DMX512 input has been rectified, the MDR splitter will automatically switch back to the cable DMX512 input.

1. Connect Power, input (if required), thru (if required) and outputs as per the DMX512 section above.

2. For Wireless Solutions W-DMX models, press and release the Function button to synchronise the receiver to the transmitter device. This process may take up to 10 seconds to synchronise. Once synchronised the Status indicator will

3. To unlink the receiver from the transmitter, press and hold the Function button until the Status indicator goes The receiver is now not linked to the transmitter.

4. For City Theatrical SHoW DMX models, there are two buttons, a display and a Status The display shows four menu choices, various settings, and unit information.

The display will timeout after 10 seconds if no button activity is detected. The left and right buttons are used to move through the menus and to adjust and select settings. The Status indicator blinks red to indicate operation and No Transmitter Detected and blinks green to indicate operation and Transmitter Detected.

5. To set the receiver to respond to the SHoW DMX transmitter, you must select one of 64 different SHoW IDs that corresponds to what the transmitter is set to. Press the Menu button to activate the display. The display will show the current ID: IDxx. Press the Select button to scroll to the required ID number. The Status indicator will blink green to indicate the receiver has synchronised to the

6. The SHoW DMX also allows you to change the Power setting. You will not need to change the setting as this will be set by LSC prior to the unit leaving the

5 Models

Model	Mount	Quantity of DMX Outputs	Type of DMX Connector	Type of Power Connector
MDRR/R	Rack	5	5-pin XLR	IEC
MDRX/R	Rack	10	5-pin XLR	IEC
MDRJ/R	Rack	10	RJ45 Ethercon	IEC
MDRR/R5N	Rack	5	3-pin XLR	IEC
MDRX/R5N	Rack	10	3-pin XLR	IEC
MDRR/RP	Rack	5	5-pin XLR	powerCON
MDRX/RP	Rack	10	5-pin XLR	powerCON
MDRJ/RP	Rack	10	RJ45 Ethercon	powerCON
MDRT/R	Table/Truss	5	5-pin XLR	IEC
MDRT/R5N	Table/Truss	5	3-pin XLR	IEC
MDRT/RP	Table/Truss	5	5-pin XLR	powerCON

6 Specifications

DMX512-A Compatible	
RDM-Enabled	
Integrated Termination Switch	
Galvanic Isolation Barrier (Volts)	1500
Short-Circuit Protected	
EMI-Filtered Outputs	
Universal Input Power Supply (V AC)	100-240
Auto Frequency Input Selection (Hz)	47-63
Power Supply On LED	
Dimensions MDRR(X/J)	480mm (w) x 44mm (h) x 110mm (d)
Dimensions MDRT	320mm (w) x 50mm (h) x 125mm (d)
Weight MDRR(X)	packed (volumetric) 2kgs

Weight MDRT	packed (volumetric) 2kgs
Construction MDRR(X/J)	All variants made from corrosion-resistant steel finished in black powder coat with rear screened polycarbonate labels
Construction MDRT	Moulded housing made from tough ABS plastic rated to UL94-V0 with rear screened polycarbonate labels
Conforms to CE Regulations	
RCM (Australian) approved	

7 Compliance Statements

The MDR DMX Splitter range from LSC Control Systems Pty Ltd meets all required CE (European), RCM (Australian) and UKCA (United Kingdom) standards.

$\mathsf{C}\mathsf{E}$ *(European Committee for Electrotechnical Standardization).*

Australian RCM (Regulatory Compliance Mark).

UK CA *UK Conformity Assessed.*
WEEE *(Waste Electrical and Electronic Equipment).*

The WEEE symbol indicates that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.

For more information about how to recycle your LSC product, contact the dealer where you purchased the product or contact LSC via email at **info@lsccontrol.com.au**
You can also take any old electrical equipment to participating civic amenity sites (often known as 'household waste recycling centres') run by local councils. You can locate your closest participating recycling centre using the following links.

- AUSTRALIA **http://www.dropzone.org.au**.
- NEW ZEALAND **http://ewaste.org.nz/welcome/main**
- NORTH AMERICA **http://1800recycling.com**
- UK **recycle-more.co.uk**.

Read More About This Manual & Download PDF:

Documents / Resources

	LSC MDR DMX-RDM Data Splitter [pdf] User Manual MDR DMX-RDM Data Splitter, MDR DMX-RDM, Data Splitter, Splitter

References

- ⊕ **RecycleNation – Search. Find. Recycle.**
- ⊕ **RecycleNation – Search. Find. Recycle.**
- ⊕ **LSC**
- ⊕ **City Theatrical Homepage**
- ⊕ **City Theatrical Homepage**
- ⊕ **LSC**
- ⊕ **LSC**
- ⊕ **Everything you need to know to Recycle More**
- ⊕ **Everything you need to know to Recycle More**

- 🌐 **Wireless DMX W-DMX™**
- 🌐 **Wireless DMX W-DMX™**