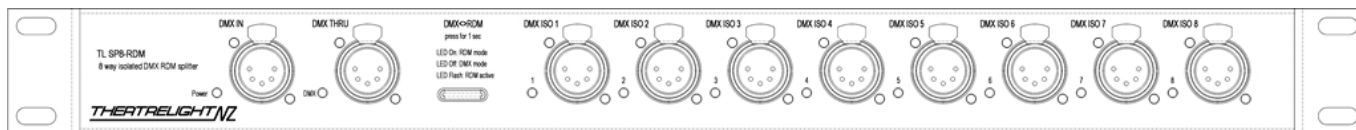# THEATRELIGHT NZ

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TL-RDM8 Isolated RDM/DMX Splitter

The RDM8 is a transparent in-line RDM splitter used for connecting a large number of RDM devices such as moving lights, LED Luminaires, smoke machines, dimmers etc to an RDM control panel. It may also be used as a DMX splitter in a DMX only system, or as a filter in an RDM system to prevent RDM commands affecting legacy DMX devices. It provides bi-directional transfer of data according to the RDM ENSA standard between its floating input (RDM "response" port) and its 8 isolated outputs (RDM "command" ports). The RDM8 is compatible with protocols ANSI E1.11 (DMX) and ANSI E1.20 (RDM).

Features

- Floating input with through connector
- LED indicator for RDM/DMX signal input
- 8 outputs, each isolated to 500VDC from Earth, from each other, and from the input
- LED indicator for RDM/DMX signals on each output, active both transmitting and receiving
- Power good LED indicator
- All outputs use 5 volt RS485 drivers for maximum signal drive and integrity
- All XLR connectors are Neutrik 5 pin. The RDM8 is also available with 3 pin Neutrik XLRs, and generic brand goldplated 3 pin or 5 pin XLRs
- Power supply 220-240 VAC 50 Hz via IEC cable (supplied). Also available in 100-120VAC 50/60Hz

The RDM8 has been designed to operate with minimal delay to any RDM or DMX signal. Whereas the RDM standard allows transparent in-line devices a maximum delay of 88 us (permitting up to 4 only cascaded RDM splitters), the RDM8 delay is only 220 nsec, allowing a much larger number of splitters to be connected in cascade. The RDM8 can be set to operate either in RDM mode, or in DMX mode, which filters out any RDM or other signals which could cause flickering on older DMX dimmers. The mode is set by holding the DMX<>RDM button for at least 1 second:

DMX<>RDM

press for 1 sec

LED On: RDM mode
LED Off: DMX mode
LED Flash: RDM active

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RDM Command mode and DMX data timing

Timing when transferring RDM commands and DMX data from a control panel to responders such as moving lights etc:

Bit leading edge delay	220±10 nsec	(RDM standard is 88 usec max)
Bit trailing edge delay	220±10 nsec	(RDM standard is 88 usec max)
Rising/falling edge skew	<20 nsec	(RDM standard is ± 75 nsec max)
Command turnaround	100 usec	(RDM standard is 132 usec max)
Response turnaround	100 usec	(RDM standard is 132 usec max)

Breaks are not shortened

RDM Response mode timing

Timing when transferring RDM responses from moving lights etc to a control panel:

Bit leading edge delay	220±10 nsec	
Bit trailing edge delay	220±10 nsec	
Rising/falling edge skew	<20 nsec	
Response block delay	<500 nsec	(delay before the first responder blocks all others)

DMX mode timing

In DMX mode the RDM8 transfers only DMX packets, filtering out any packet with a channel zero value other than 0:

DMX byte delay	min 44 usec, max 55 usec (delay in re-transmitting any DMX byte)
DMX break start delay	min 44 usec, max 55 usec (delay in re-transmitting break start)
DMX break end delay	min 44 usec, max 55 usec (delay in re-transmitting break end)

Setting RDM Mode

If the Key LED is off, press and hold the DMX<>RDM key for at least one second. On releasing the key the Key LED will come on, indicating the RDM8 is now in RDM mode. In this mode all RDM and DMX data is transferred from the input to the 8 outputs directly. If any RDM command requires a response, the data direction is reversed to allow all 8 outputs to respond, with the first reponse blocking any reply from the other 7 outputs within 0.5 usec. RDM commands will flash the Blue Key LED for 1 second, and during data turn-around, all responder LED indicators will flash as well. The RDM mode selection is saved to Flash memory, and restored on power up.

Setting DMX Mode

If the Key LED is on, press and hold the DMX<>RDM key for at least one second. On releasing the key the Key LED will go off, indicating the RDM8 is now in DMX mode. In this mode only DMX data (ie data with Channel 0 = 0) is transferred from the input to the 8 outputs. RDM commands or other packets where Channel 0 is not zero will be blocked. The DMX mode selection is saved to Flash memory, and restored on power up.

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RDM8 Connection in an all-RDM System

The RDM8 is configured to be transparent and fast. To that end it is not discoverable as an RDM responder, and in common with RDM splitters made by Pathway, Enttec and others, it does not operate as an RDM proxy device. Accordingly when used in an RDM system, multiple RDM8s must be connected in cascade (star) mode to prevent data collisions. The correct method of driving (for example) 36 RDM/DMX lines is as follows.
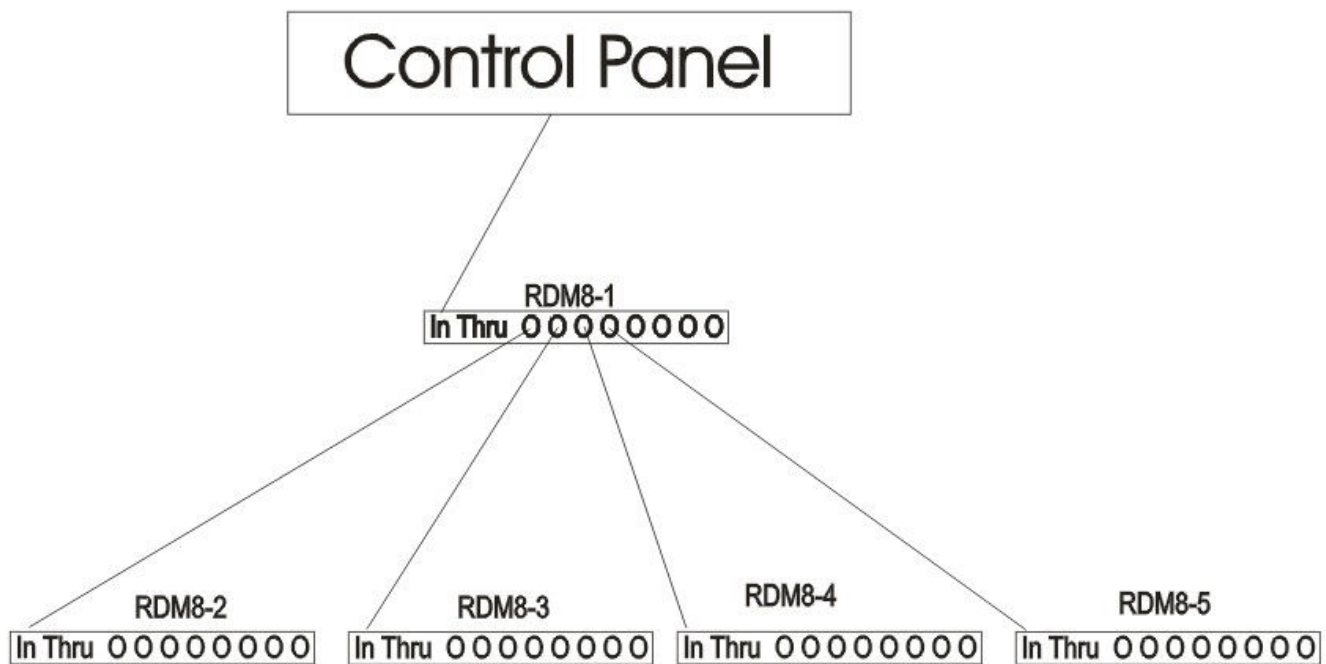
The star connection above provides 36 RDM outlets – any of which can then drive a normal RDM/DMX daisy chain of up to 32 RDM devices. More RDM8 splitters can be added, *so long as each RDM8 input is connected to another RDM8 output*. To avoid data clashes, do not connect any RDM devices (including RDM8s) to the RDM8 Thru output.

RDM8 Connection in an RDM System using Legacy DMX devices

When legacy DMX devices (mostly older dimmers) are used in an RDM system, the dimmer levels may flicker during RDM commands. To remove any flickering, group all DMX lines to the legacy devices onto one or more RDM8s *set to DMX mode* (Key LED Off). In this mode any RDM commands are filtered out- only true DMX signals (those with DMX Channel 0 at level 0) are propagated.

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RDM8 Connection in an DMX Only System
If used in a DMX only system (where all Channel 0 values are 0), multiple RDM8s may be daisy chained as normal – in a DMX system there is no danger of data collisions as data transmission is always unidirectional: from the control panel to the lights or dimmers. In such a system the fastest response is obtained by setting *RDM mode* (Key LED On). This switches off the filter as it is not needed, ensuring DMX data is transmitted with the minimum delay.

Line termination
To reduce the effect of signal reflections, the last device in any RDM or DMX line should always be terminated with a 120 ohm resistor across the Data + and Data – line (ie between pins 2 and 3 of either the XLR5 or XLR3 connector).

Ordering information
The RDM8 is supplied in a 1U 19 inch rack mount case, with rack mounting ears, wall mount plate, and a bracket for hanging from a standard lighting bar.

RDM8 options:

Model	XLR type	Power
RDM8	5N (Neutrik 5 pin)	100 (100-120 Vac, 50/60Hz)
	3N (Neutrik 3 pin)	240 (220-240 Vac, 50 Hz)
	5 (Generic gold plated 5 pin)	
	3 (Generic gold plated 3 pin)	