EtherN.8 RDM & EtherN.2 RDM Ethernet DMX output devices

User guide





Please read these instructions before using the product.

This product has been designed & manufactured for professional use only. It should only be installed by a suitably qualified technician and in accordance with electrical regulations in the country of use. Unless directed in the instructions, there are no user serviceable parts inside the outer case of this Product. Always disconnect from the power supply when not in use. Any specific IP rating, where appropriate, is given in the instructions. Unless otherwise stated this product is designed for Indoor use only. If used outdoors it MUST be installed in an appropriate IP rated cabinet. Do not allow this product to be exposed to rain or moisture. Do not allow liquid to penetrate the product.

Please recycle all packaging.





EtherN.2 RDM

Overview

EtherN.8 **RDM** is a 1U Rack Mounted Art-Net to DMX/RDM converter capable of outputting upto 8 universes of DMX/RDM data.

EtherN.8 **RDM** houses four internal modules; each module comprising two DMX ports which are independently discoverable and configurable - each with four indicators. There are two Network connections to allow multiple units to be connected together.

EtherN.2 **RDM** is a wall-mounted panel Ethernet to DMX512 converter. It converts Art-Net Ethernet data into two universes of DMX/RDM data.



Power Supply

The EtherN.2 **RDM** supports both Power over Ethernet and local DC power supply (not supplied) via the supplied Jaguar DC connector. The EtherN.2 **RDM** can receive DC power from 9 to 48V, and consumes 2 Watts. When connected to a Power over Ethernet feed, the EtherN.2 **RDM** only requires the RJ45 network connection. The EtherN.8 **RDM** is fitted with an internal power supply which requires an 85 – 264V AC input with an earth connection. The mains fuse should only be replaced with a 3.15A Slow Blow.

Earthing

The following table details the internal Earth interconnection and isolation on the EtherN.8 **RDM**

| Circuit | Description | |
|-----------------------|---|--|
| Chassis | Bonded to Earth-Ground | |
| DMX512 Ports | Туре: | Grounded |
| | Pin 1: | Connects to internal Logic Ground. |
| | Shell: | The connector shell is connected to chassis |
| Ethernet | Туре: | Transformer Isolated |
| | Screen: | Connects to Earth-Ground via 75 ohm resistance & 100pF capacitance, as specified in the IEEE standard |
| Internal Logic Ground | Connects to Earth-Ground via 10ohm resistance | |

Please note that we use the term Earth-Ground to avoid international confusion. In Europe Earth-Ground is called Earth, in the USA Earth-Ground is called Ground.

Art-Net Interface

Art-Net is a TCP/IP based Ethernet protocol developed by Artistic Licence. It uses standard Ethernet distribution hardware to transport many DMX universes across the network, reducing cabling.

EtherN.8 **RDM** has two network connections, one on the front panel and one on the rear. Both can be used to connect the EtherN.8 **RDM** into a network. If looping to another EtherN.8 **RDM** it is recommended that this is only done to a maximum of three times.

EtherN.2 **RDM** has s single network connection, on the rear, which also provides power to the unit.

Connect to 10/100BaseT Ethernet Hub/Switch using Cat5 cable or better.



Wiring Detail

The following guide should be used if custom Cat5 cables are being used.

As EtherN.8 **RDM** has an internal Ethernet Switch, the following guidelines must be used when connecting to a network:

| Connecting EtherN.8 RDM to: | Cable to be used: | |
|-----------------------------|----------------------|--|
| Ethernet Switch | Cross-Over Cable | |
| Computer or Node | Patch/Straight Cable | |

When connecting an EtherN.2 $\ensuremath{\text{RDM}}$ to a network, the following guidelines must be used:

| Connecting EtherN.2 RDM to: | Cable to be used: | |
|-----------------------------|----------------------|--|
| Computer or Node | Cross-Over Cable | |
| Ethernet Switch | Patch/Straight Cable | |

Patch/Straight Cable

| White/Orange | White/Orange |
|--------------|------------------|
| Orange | Orange |
| White/Green | White/Green |
| Blue | Blue |
| White/Blue | White/Blue |
| Green | Green |
| White/Brown | White/Brown |
| Brown | Brown |

Cross-Over Cable

| White/Green | / | White/Orange |
|--------------|-----------------------|--------------|
| Green | × × / | Orange |
| White/Orange | | White/Green |
| Blue | | Blue |
| White/Blue | | White/Blue |
| Orange | | Green |
| White/Brown | | White/Brown |
| Brown | | Brown |



RJ45 Connector



XLR5 Female



DMX Connections

The DMX512 is connected to the 5 pin XLR on the front panel. Cable connection is as follows:

| XLR Pin | RJ45 Pin | Convention | Function | RJ45 Colour |
|---------|----------|------------|------------|----------------|
| 1 | 7 | Black | Ground | White / Brown |
| 1 | 8 | Black | Ground | Brown |
| 2 | 2 | Blue | Data - | Orange |
| 3 | 1 | Red | Data + | White / Orange |
| 4 | 6 | n/c | Aux Data - | Green |
| 5 | 3 | n/c | Aux Data + | White / Green |

The DMX512-A standard specifies that Cat5 cable can be used to carry DMX data. The table above shows which cores should be used. It is recommended that a good quality Cat5E cable is used.

For the outputs, RDM data uses the same connections as the DMX data.

RDM

RDM (Remote Device Management) is a PLASA Standards protocol from the Technical Standard Program that allows Bi-Directional communication over standard DMX cable. This enables a controller to have access to a DMX / RDM fixtures configuration and to alter this configuration remotely. The most obvious use is to be able to remotely set the start address of the fixture. However there are many other benefits to RDM such as sensor feedback, firmware uploads and automatic patching.

EtherN.8 **RDM** and EtherN.2 **RDM** fully support the RDM protocol (E1.20 - 2006) via Art-Net transport, but can also be used within networks where there is no RDM present.

Power Requirements EtherN.2 RDM

15VDC to 48VDC @ 200mW (RJ45, Power over Ethernet) 9VDC to 48VDC @ 200mW (Jaguar)

Connection Options

• Powered Hub: Connect to IEEE802.3 PoE compliant 10BaseT Hub/Switch. This will provide device power via the Ethernet connector

• Independent Power: Connect DC power as specified above to the 2 pin Jaguar Connector located near the RJ45.

EtherN.8 RDM 85VAC - 264VAC, 25W

Power is supplied via IEC C13 connector. The unit must be grounded. The mains fuse should only be replaced with a 3.15A Slow Blow Fuse.



Indicators

EtherN.2 **RDM** features one 'module', whilst EtherN.8 **RDM** comprises four 'modules'. Each module has a set of indicator LEDs. The front panel Ethernet Connector on EtherN.8 **RDM** also has status indicators.

Module Indicators

| STAT | On when the unit is powered. Flashing if a hardware fault is found. |
|---------------------------|--|
| NET | On when the network data is active. |
| DMX A/B | On when DMX data is being transmitted. |
| BOOT UP | During boot up, the LEDs will sequentially step. |
| BOOT LOADER | When in bootloader mode, the 'NET' LED will flash continuously. |
| ALL FLASHING (3 times) | The Sub-Net switch has been changed but the value has been set remotely. |

Ethernet Indicators

| PWR | Power LED. |
|------|---|
| LINK | On if there is a valid link between this connection and another Ether- net device. |
| ACT | Flashes when data is being either received or transmitted. |
| SPD | On if this connection is running at 100BaseT, Off if running at 10Ba- seT. |

Universe & Sub-Net Selection

In Art-Net each universe being transmitted is set to a particular Sub-Net and Universe number to allow it to be distinguishable from other universes on the same network. This allows up to 256 independent universes to be on the same network. Using standard Ethernet distribution the maximum number of universes is 40. With correct network design this number can be increased.

| Port | Universe | Port | Universe |
|------|----------|------|----------|
| 1 | 0 | 9 | 8 |
| 2 | 1 | 10 | 9 |
| 3 | 2 | 11 | А |
| 4 | 3 | 12 | В |
| 5 | 4 | 13 | С |
| 6 | 5 | 14 | D |
| 7 | 6 | 15 | E |
| 8 | 7 | 16 | F |



Universe

By default, each port of the EtherN.8 **RDM** has a sequential universe number, starting from 0. To change the universe, use either the internal web-server or configure it from your ZerOS console. The table overleaf shows the default settings.

Sub-Net

The Sub-Net for all the modules can be set by using the front panel Sub-Net switch. Alternatively, any of the below configuration methods can be used to set a module's Sub-Net .

NB: If all the indicators flash when a switch setting has been changed, the product will have been remotely configured, i.e. by DMX-Workshop or the internal web-server.

Configuration

There are three ways of remotely configuring a EtherN.8 RDM and an EtherN.2 RDM;

- Web-Server
- ZerOS console
- DMX-Workshop

Web-Server

To configure the EtherN.8 **RDM** or EtherN.2 **RDM** via the internal web-server, either type the IP address of one of the modules or, if your web-browser supports NetBios, then use the name; en8rdm or en2rdm in your address bar (eg: http://en8rdm/).

The internal web page will show the current status of each module, such as it's DMX status and IP address.

There are two options for each module;

- DMX Settings Sets universe & sub-net values DMX Output Profile
- IP Settings

Set a custom IP address, Sub-Net and Gateway IP





Cancel Save



ZerOS Configuration

It is also possible to configure the EtherN.8 **RDM** and EtherN.2 **RDM** from within your ZerOS console (running ZerOS version 8.0 or above). In the Network/Devices tab, each module appears as a seperate device that you can configure using the on-screen controls.



DMX-Workshop

DMX-Workshop is free Art-Net configuration software available from Artistic Licence. Within the 'Network' view you will see four nodes for a single EtherN.8 **RDM**, and one node for an EtherN.2 **RDM**. To configure a module, right click over the entry and the configuration menu appears.

The variables that can be configured are;

- Universe and Sub-Net Values
- Label
- IP Address
- DMX Output Merge mode (LTP / HTP)

| Name: | |
|--|--------------------------------------|
| Short Default name Long | DMX Output Port 1 & 2 |
| DMX Input: Port 1: 0 (0) | I) • Port 3: 0 (0) • Port 4: 0 (0) • |
| DMX Dutput: Port 1: 0 (0) Port 2: 0 (0 |) Port 3: 0 (0) Port 4: 0 (0) |
| Sub-Net Address: | X Cancel Program Node |

Transmit Style

Delta – DMX Output packets are synced with incoming Art-Net packets.

Continuous – DMX output packets are continuously transmitted independently of the Art-Net inputs.

Output Profiles

When configuring the EtherN.2 **RDM** and EtherN.8 **RDM** via the web interface, three output profiles are offered to suit different DMX equipment connected.

| Profile Name | RDM | Transmit Style | Max Refresh Rate |
|---------------|-----|----------------|------------------|
| Best | ON | Delta | 43.57 FPS |
| Compatibility | OFF | Delta | 43.06 FPS |
| Fix | OFF | Continuous | 39.95 FPS |

In addition to these profiles, a Custom mode is offered to allow custom configuration as required.



Jumper Settings

In normal operation EtherN.8 **RDM** and EtherN.2 **RDM** do not require any configuration. However there are several advanced settings that can be required to overcome various issues in more complex installations.

To fit a jumper to EtherN.8 RDM, follow the instructions below:

- 1) Disconnect the Power from the unit
- 2) Ensure you have adequate Anti-Static protection
- 3) Remove the top row of screws from the front panel
- 4) Remove the bottom row of screws from the rear panel
- 5) Carefully pull the two halves apart, about 10cm

The table below describes the function of each jumper. By default none of the jumpers are connected.

| Jumper | Option |
|--------------|---|
| JP0 - JP3 | Not Assigned |
| JP4 | Connect to switch to the alternate 10.x.x.x network. |
| JP5 | Connect to disable RDM. |
| JP6 | Connect to invert the low byte of the IP address. |
| JP7 | Connect to restore default settings on EtherN.2 RDM . Not assigned on EtherN.8 RDM . |

ROM Boot Jumper

EtherN.8 **RDM** and EtherN.2 **RDM** have a built in fail safe mode that will put the unit into a basic running state allowing new firmware to be uploaded. This is only to be used if the currently installed firmware becomes corrupted.

To get an EtherN.8 **RDM** or EtherN.2 **RDM** to boot in Boot Loader mode, simply power the unit up with the ROM boot jumper linked. The 'Net' Indicator will flash when in Boot Loader mode. If the jumper is removed and the unit is powered up it will return to the current installed firmware.

Firmware Upload

As new revisions of the firmware are released (due to upgrades) it is possible to upgrade your EtherN.8 **RDM** and EtherN.2 **RDM** to the latest version. Please refer to the firmware upgrade instructions (published with the firmware) for more details.



Error Messages

On power up, the EtherN.8 **RDM** and EtherN.2 **RDM** run a number of self checks to ensure that it is functioning correctly. If an internal fault occurs the LED's are used to display an error code.

| LED State | Description |
|-------------------------------------|----------------------------------|
| Stat & All Alternatively Flashing | SRAM Fault* |
| Net & All Alternatively Flashing | E2Prom Fault* |
| Port A & All Alternatively Flashing | System ROM Fault* |
| Net Flashing | Module is in Boot Loader Mode |
| All three times | Sub-Net switch is locked out |
| Port LED Flashing | Output is merging data |

* = Contact Cooper Controls for advice

Mounting



| 257.00 mm | |
|-----------|--|
| | |



Troubleshooting

Q) My fixtures are flashing randomly when connected to a EtherN.8 **RDM** or EtherN.2 **RDM**?

A) The common cause of this is that they are responding to RDM data being transmitted by the EtherN.8 **RDM** or EtherN.2 **RDM**. If they are DMX512 compliant they should ignore this data. To overcome this refer to the 'Jumper Settings' section and link the jumper to disable RDM. Alternatively this can be done via the web-server.

Q) My fixture seems to lose DMX when set to high start addresses?

A) Some older equipment can not handle full rate DMX refresh rates. This results in it working on lower start addresses but seems 'steppy' on higher start addresses. To overcome this use the web-server advanced DMX page and slow the refresh rate down. Refer to the 'web-server' section

Q) EtherN.8 RDM or EtherN.2 RDM boots up but the 'Net' LED is always flashing?A) This means that the unit has gone into boot loader mode. Uploading the latest firmware will allow the unit to function normally

Q) I changed my IP address and have lost all communication with the EtherN.8 **RDM** or EtherN.2 **RDM**?

A) When you change the IP address of a device out of the range the PC is on you must then change the PC IP address to match. If you still can not discover the device you will need to reset all custom settings to put it back into the default IP range (2.x.x.x). To do this refer to the 'Jumper Settings' section

Q) All the Module Indicators flash three times when I change the Sub-Net switch?A) If the Sub-Net values have been set remotely the front panel switch is ignored. The LED's flash to show that the switch is being ignored.

Q) I have connected three or more EtherN.8 RDM's in series and the data seems to be delayed from the first to the last?

A) If several EtherN.8 **RDM**'s are connected in series then the data from the control source has to be re-transmitted to each one. The more in series the longer the delay. To overcome the delay use an Ethernet Switch and connect all EtherN.8 **RDM**'s and control sources to it.

Q) An output port LED is flashing continuously and the DMX LED is flashing?A) When the port LED is flashing it means that the output has two universes it is merging.



Warranty

All products manufactured by Cooper Controls are warranted to be free from defects in material and workmanship and shall conform to and perform in accordance with Seller's written specifications.

For detailed warranty information, visit our website at www.coopercontrol.com

This warranty will be limited to the repair or replacement, at Seller's discretion, of any such goods found to be defective, upon their authorized return to Seller. This limited warranty does not apply if the goods have been damaged by accident, abuse, misuse, modification or misapplication, by damage during shipment or by improper service.

There are no warranties, which extend beyond the hereinabove-limited warranty, INCLUDING, BUT NOT LIMITED TO. THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS.

No employee, agent, dealer, or other person is authorized to give any warranties on behalf of the Seller or to assume for the Seller any other liability in connection with any of its goods except in writing and signed by the Seller. The Seller makes no representation that the goods comply with any present or future federal, state or local regulation or ordinance. Compliance is the Buyer's responsibility.

The use of the Seller's goods should be in accordance with the provision of the National Electrical Code. UL and/or other industry or military standards that are pertinent to the particular end use.

Installation or use not in accordance with these codes and standards could be hazardous.



www.vari-lite.com