



## RDM Basics

### What is it?

Remote Device Management, or RDM, is a new standard for allowing DMX enabled devices to communicate in both directions along existing DMX cabling. RDM is intended to work seamlessly with existing DMX cabling and equipment - it uses the standard data pins (pins 2 & 3) to both send and receive data.

### What does it do for me?

Consider this scenario – a moving light has been rigged and addressed during the fitup. For whatever reason, the fixture personality was set incorrectly and the lamp was set not to strike automatically. Now when you try to pan the fixture, it strobes in purple. Once the rig was up, the carpenters moved in and scenery has been built below. Access is very limited and to reach the fixture to correct these settings would involve a precariously balanced ladder or removing some of the scenery. To fix this problem would conventionally take anywhere between ten minutes and several hours.

Consider another scenario – you have just hired in some new XYZSpot2000s from your local hire company, which they've only just acquired. Nobody has a manual for the fixtures and your console doesn't have a fixture personality built in for them, so you're going to need to download a new personality from the internet, or create it yourself. The wireless will probably drop out whilst you try to download the file, you'll never be able to find a USB stick when you need one and can you remember which menu option it was to invert the tilt on the fixture in the console's fixture editor?

RDM does away with all these headaches. The DMX personality and address of the fixture can be set remotely using RDM messages. Again using RDM commands, the lighting desk can interrogate the fixture to find out what control channels it has (Pan, Tilt, Gobo, Colour etc) and what the default values for those channels should be. In this way, the lighting desk builds its own control personality for the fixture, without needing a fixture personality. This offers plug-and-play functionality when a lighting desk and fixture meet for the first time.

RDM also allows fixtures to report back status information to the controller, such as temperature, lamp hours, and any faults which might have occurred so that with the aid of a laptop and an RDM enabled DMX dongle, detailed feedback from an RDM system is available.

### How does it work?

An RDM system is comprised of two basic types of devices – controllers and responders. A controller is a device such as a lighting desk; a responder is a device such as a dimmer or a moving light. Controllers initiate all RDM conversations, the rule is that responders do not transmit messages until told to do so by the controller. You can think of it like a website – the information is out there, but you have to click the link to ask for it.

Unlike old-school DMX, communication on the DMX data link happens in two directions in RDM – because of this, distribution equipment such as splitters, wireless DMX systems etc must be RDM 'protocol aware' so that they know when to send information and when to receive it.

RDM starts off with a process called discovery. This is where the controller finds out what RDM responders are present on the DMX data link. Every RDM responder has a unique number encoded into it during manufacture (like a serial number, but following RDM definitions), so even if you have say 5 Chilli dimmers all at DMX address 1, the controller will still be able to discover each one uniquely.

Because DMX wiring is daisy-chained between devices, RDM does not know or care in what order the devices are physically wired. However, as the user, you do care what order the devices are in. You want to put the six moving lights you have on your front truss on fixture buttons 1-6 on the lighting desk, in the right order. RDM has a built-in identify feature which allows you to do this. When a device is instructed to identify by the controller, it switches on, strobes, flashes some lights, anything to get your attention. Once you know which one it is, you choose where to put it on the lighting desk. In this way you work through your rig, visually identifying the devices that RDM has discovered, and telling the lighting desk where you want to assign them.

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### Will my existing kit do RDM?

For some time now, the majority of new DMX products have claimed in some way to be 'RDM ready'. Usually this means that the hardware is expected to be capable of supporting RDM, but that the software has not yet been implemented. Look for 'RDM enabled' equipment to be certain that it supports RDM functionality. It may be possible to upgrade the firmware in some older 'RDM ready' products, contact the manufacturer for further details.

DMX cables only need to use the first data pair on pins 2 & 3 to work with RDM. The second data pair on pins 4 & 5 is not used. DMX splitters and radio links need to be RDM enabled to work in an RDM system.

### How did RDM come about?

RDM was originally designed by a number of lighting manufacturers in cooperation, and eventually turned into an ESTA Protocol project. Working through the protocol development process took a number of years and eventually an ANSI standard was approved. The standard has been published for a number of years now, and while some minor updates and corrections are being made to the text of the document, the protocol is gaining rapid adoption among many manufacturers as being stable, tested and reliable.

Prototyping and testing formed part of the RDM protocol development, and ESTA continue to sponsor regular RDM 'plugfests', where many manufacturers bring along their RDM products to see if they all work together as intended. This also happens at the PLASA and LDI tradeshows, where at the RDM interoperability stand, equipment is plugged together and tested under the watchful eyes of those who helped develop the standard in the first place.

### Is RDM here to stay?

The large installed base of equipment and cabling means that DMX is here to stay for some time yet. Because RDM makes use of this, it is in no danger of being replaced by Ethernet overnight. Because RDM sits on top of DMX, it also lends itself to implementation in simpler lower-cost products that cannot support more complex Ethernet protocols.

The ESTA Control Protocols Working Group are currently working on some new message sets for RDM to add functionality, focussed primarily on enabling dimmers to be fully configured remotely, and Zero 88 are actively participating in this.

At Zero 88, we think DMX and RDM will become synonymous very soon, because no-one will want a DMX device where you have to physically get at the buttons on the side of it to do anything with it. This is particularly useful in architectural and LED intensive applications where the logistics of getting at the DMX address switches on the fixtures themselves becomes prohibitive.

### Will I notice that I'm using RDM?

Due to the way the protocol has been written, no adverse affects should appear when using RDM. The standard enforces tight timing rules ensure that control of the data link is returned to the controller in a timely fashion, so that update rates for DMX data are not adversely affected.

### Should I insist on RDM for new equipment?

Yes. The motto of the ESTA RDM Task Group is "quicker than a man with a ladder", assuming of course that your venue's health & safety policy would allow you to use a ladder in the first place!

### Want to know more?

The protocol has the official title "ANSI E1.20-2006, Entertainment Technology - Remote Device Management over USITT DMX512 Networks" and is an approved American National Standard. It is available for download from the ESTA website. You can also read more about RDM on the RDM Protocol website – [www.rdmprotocol.org](http://www.rdmprotocol.org)

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