help desk

RDM: Faster than a ladder | By Wayne Howell

What is RDM? Its full name is 'ANSI E1.20 - 2010. Entertainment Technology. RDM Remote Device Management over DMX512 Networks' - no wonder we just call it RDM! RDM is the sister to DMX512. DMX allows data to be sent in one direction: from console to lights. RDM allows data to travel in the opposite direction: from lights to console. It also defines a language of commands and queries that allow the console to remotely manage the fixtures. The most widely used functionality this provides is to set the start address and personality of a fixture.

One major goal in the design of RDM was to ensure that it did not impact the refresh rate of the ordinary DMX. This was achieved - the design brief for RDM was that it only had to be 'faster than a ladder'. That is to say: if using RDM to set a start address is quicker than a rigger climbing a ladder to change the physical switches, then it has achieved its goal. In reality, RDM is massively faster than the rigger with ladder and, in any case, most widely-used in architectural applications where ladder access is impossible.

UNDER THE HOOD: HOW DOES RDM WORK?

Prior to RDM, fixtures were often identified by their DMX512 start address. While that works, many fixtures can have identical start addresses. RDM communication requires the ability to uniquely identify a fixture, and so the UID (or Unique Identifier) was introduced. The UID is a 48-bit number that is globally unique. The first 16-bits identify the manufacturer of the fixture and the remainder can be thought of as an electronic serial number. When a console is first powered, it starts a process called 'discovery,' which allows the console to generate a list of all the fixtures' UIDs.

The console then switches to a mode where it learns which commands the fixtures support and starts to retrieve info such as start address and personality using 'Get Commands'. This info can be presented to the console operator via the user interface. When a change is needed, the console sends a 'Set Command' to make the change.

All the discovery, get and set operations are interleaved with standard DMX data by quickly switching the direction of data flow on the DMX cable. As the RDM packets are very small and usually infrequent, they have a minimal effect on the bandwidth available for standard DMX: approximately 3% of the bandwidth is used by RDM.

THE REAL WORLD: COMMON MISCONCEPTIONS

In some quarters, RDM has unfairly gained a bad reputation. I hope that this article will overturn some common misconceptions:

Misconception 1: RDM needs DMX cable with pins four and five connected . . .

This is incorrect. RDM will work perfectly on any DMX-compatible cable. RDM works by switching the direction of the main data wires (pins two and three), it does not use pins four and five.

Misconception 2: RDM makes my fixtures flicker . . .

This rather depends on the fixtures. If the fixture is actually DMX-compatible then RDM will not cause it to flicker. It all stems from a concept called the 'Start Code'. Every DMX packet has a start code and normal level data has a start code value of zero. The other values are used for specialist data including RDM. A well-designed fixture will check the start code of each packet of DMX and discard those it doesn't understand. Sadly, there are a number of fixtures on the market - particularly LED colour mixers - which claim to be DMX-compatible but are not. These are the ones that flicker.

Obviously, the best solution to RDM-related flicker is to use fully DMX compatible products, but in the real world that is not always possible. There is, however, a workaround: Are you seeing flicker with a regular repeat rate of two to five seconds? This is almost certainly caused by the fixtures being incompatible with RDM. The console may have the ability to turn off RDM. If not, you could try moving your fixture start addresses up to high values. This is trick that works most of the time because RDM packets are mostly shorter than standard DMX packets.

Misconception 3: I need specialist splitters . . .

It is certainly true that splitters must be RDM-compatible, but this is already the norm with most splitter manufacturers.

Misconception 4: RDM slows the DMX data . . .

To an extent, it does - but by a very small amount. However, you can usually choose to switch it off during the show if the slight loss of bandwidth is a problem.

THE FUTURE

While RDM is over 10 years old, it has only recently seen a strong growth in support. Many consoles are offering little more than the ability to remote set the start address, but RDM offers so much more. Status and sensor monitoring is a key part of RDM which allows the console, or a show / building management computer to monitor the fixtures. Sensor data could include the temperature of the LED heatsink, or the amount of fluid left in a fog machine. The UID provides a very powerful basis for inventory and hire management. Software could automatically log-in the return of hire stock, retrieve lamp use data and any fault reports.

We are just starting to see console manufacturers interrogate fixtures for their manufacturer code and then download the lamp library from the manufacturer's website - relieving the operator of that task.

RDM is an evolving standard, the next version is likely to include a language that provides syntax to allow a console to generate a lamp library 'on-the-fly' by interrogating the fixture.

Transfer of RDM data over ethernet networks is of key importance and will be the subject of a future Help Desk article. Currently the only open protocol that allows transfer of RDM data is Art-Net, using the ArtRdm system which encapsulates an RDM packet for network transfer. A new ANSI standard called RDMnet (E1.33) is also under development. ⊗

Further reading: Control Freak
⤣ www.tinyurl.com/AL-control-freak

A Note of Clarification: In last month's *Help Desk* it was said that the use of three pin XLR connectors was 'strictly illegal'. This meant in relation to the standard, not in relation to any government law.

Wayne Howell is the CEO of Artistic Licence, the lighting controls company that he founded in 1988. Wayne invented Art-Net and is actively involved in the ESTA technical standards programme.