

# RC4Magic Series 2

## Wireless DMX and Wireless Dimming

### DMX Cable Elimination and Data Distribution

The **RC4Magic Series 2 DMXio** wirelessly transmits and receives a full universe of DMX lighting control data, replacing DMX cables. A pair of **DMXio** units work reliably to 200 feet – often more – inside theatres and other performance spaces.

Any number of **DMXio** receivers can be used in an **RC4Magic Series 2** system. Thus, an **RC4Magic** system can replace splitters and distribution boxes, providing superior electrical isolation.

Operating as a transmitter, the **DMXio** encodes and encrypts the incoming DMX universe, and broadcasts it using Direct Sequence Spread Spectrum (DSSS) digital radio. Unlike wired DMX, the broadcast signal includes error checking and correction codes, and is not affected by minor interruptions and interference. DMX channels that are rapidly changing are allocated more bandwidth than channels that are changing more slowly. All channels are broadcast with appropriate speed, redundancy and accuracy.

As a receiver, the **DMXio** decodes the rf signal, rebuilds the DMX universe, and regenerates a standard DMX signal with the same number of data channels and the same packet update rate as the source signal. This avoids unwanted signal aliasing while conserving valuable rf data space.

DMX in and out are compliant with USITT DMX512/1990. Any number of DMX channels are accepted by the transmitter over a wide timing range, as required by the standard.

### Wireless Low-Voltage Dimming

**RC4Magic Series 2 DMX2dim** and **DMX4dim** receiver-dimmers decode the rf signal from a transmitting **DMXio**, rebuild the DMX universe, and send user-assigned DMX levels to built-in low-voltage dimmers. Channel assignments are made with two recessed pushbuttons. In addition to DMX channel, each dimmer can also be assigned one of several dimmer curves including linear, ISL (inverse-square-law), and non-dim. Linear is ideal for MR16s and other incandescent or halogen lamps; ISL is ideal for Rosco LitePads and other LED devices.

In addition to the small and popular **DMX2dim** and **DMX4dim**, larger high-power dimmers are also available for the **RC4Magic Series 2** system. Please call or visit our website for additional information.

Any number of receiver-dimmers of any size can be used in an **RC4Magic Series 2** system.

- **DMX-controlled battery-powered lighting in costumes, props, set-pieces, and more**
- **wireless remote dimming of lamps and LEDs, including MR16s, MR11s, and Rosco LitePads**
- **low-cost, secure and reliable wireless DMX**
- **eliminate tripping hazards and cables underfoot**
- **rapid system setup, rearrangement, teardown**
- **get DMX data to turntables and other hard-to-reach locations**
- **ideal for theatre companies and touring productions**
- **RF agency approvals for worldwide use**



### Data and System Security

Every **RC4Magic Series 2** system is factory programmed with three unique private system IDs and one public ID. These IDs are indicated on the outside of each unit. Only **RC4Magic Series 2** units assigned to the same ID number will communicate with each other. Three private IDs allow multiple **RC4Magic Series 2** units to be configured in up to three different wireless networks, each transporting a separate DMX universe. The public ID is available on all **RC4Magic Series 2** units, allowing multiple systems to be combined to operate as one large system.

In an uncluttered radio environment, up to 15 different **RC4Magic** system IDs can operate in the same 200-foot radius without interference. Even in an area with considerable rf congestion, several **RC4Magic** systems will still be able to find the bandwidth they require.

**RC4Magic Series 2** units can be added to any system at any time by specifying the required system IDs at time of order.

### Power-Up Sequence and Channel Assignments

When an **RC4Magic DMXio** transmitter first powers up, it scans the 2.4GHz radio band, which supports many radio channels, looking for the channel with the least activity. It then transmits DMX data on that channel, encoded with the selected system ID.

When a **DMXio** or **DMX2dim** receiver powers up, it scans all 2.4GHz radio channels looking for encoded signals from a **DMXio** transmitter on the correct ID.

If a receiver does not detect valid data for 10 seconds, the start-up scan is repeated. Thus, **RC4Magic Series 2** receivers always follow and connect with their associated **DMXio** transmitter, even after a power failure.

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## RC4Magic Series 2 DMXio Wireless Input/Output Data Module

Inside the **DMXio** are 4 small dipswitches to select transmit/receive mode, active system ID, and rf output level (for North America, Europe, Japan, etc.)

Power can come from the supplied wall transformer or batteries. A small pack of six AAA or AA batteries, or a 9V battery, can be used for portable operation.

Wireless range typically exceeds 200 feet between **DMXio** units. Line-of-sight is not required, but dense objects between units – like concrete walls – will attenuate the radio signal and reduce the available range.

### DMXio Transmitter Mode

Only one **DMXio** transmitter should be operated on each system ID. It will transmit one complete DMX universe of up to 512 channels.

The **DMXio** input is compliant with USITT DMX512/1990(4us), with no internal termination. If you are putting the **DMXio** at the end of a long DMX cable, a terminator plug should be used.

In many cases, the **DMXio** can be connected right at your lighting console or other controller, before your DMX signal continues to other devices in your system.

### DMXio Receiver Mode

Any number of **DMXrx** receivers can be used in an **RC4Magic** system.

The **DMXio** output is compliant with USITT DMX512/1990. If you are putting the **DMXio** at the beginning of a long DMX cable run, a terminator should be used at the end, just as you would do with any DMX network. For short cable runs, termination is often unnecessary.

It can take up to 10 seconds for the **DMXio** receiver to connect to the **DMXio** transmitter and begin outputting useful DMX data.

### DMXio Specifications

**Dimensions:** 3.4" x 2.2" x 1.6" nominal (approx. 86mm x 56mm x 40mm)  
**Transmitter Input:** meets USITT DMX512/1990(4us), NO INTERNAL TERMINATION  
**Receiver Output:** meets USITT DMX512/1990  
**Power Input:** 8VDC - 12VDC, 500mA, standard 2.1mm receptacle, center positive  
**RF Antenna:** hidden internal, generic dipole "donut" radiation pattern, widest horizontal dispersion with RF Hotspot facing up

## RC4Magic Series 2 DMX2dim Wireless Receiver-Dimmer

The **DMX2dim** is very small and includes a built-in radio receiver and 2 low-voltage pulse-width-modulation dimmers.

Any number of **DMX2dim** receiver-dimmers can be used in an **RC4Magic** system.

The radio receiver operates identically to a **DMXio** receiver. It can take up to 10 seconds to connect to a **DMXio** transmitter and begin powering the dimmer outputs.

Screw terminals are provided for connection of the power supply (+/-DC IN) and load devices (+/-DimA and +/-DimB). The supply powers both the internal electronics and the connected loads. Dimmers use high-frequency pulse-width-modulation, switching on the negative side of the circuit.

The most common power supply is a 12V sealed lead-acid rechargeable battery. The maximum voltage for the **DMX2dim** is 18V (12V nominal). A user-accessible Bussmann ATC-series fuse protects the connected wiring and loads and is in the positive side of the circuit. The maximum fuse size is 15A (ATC-15), and must be the fast-blow type.

### DMX2dim Specifications

**Dimensions:** 2.4" x 1.4" x 0.8" nominal (approx. 61mm x 36mm x 21mm)  
**Power Input:** 6VDC - 18VDC (12V typical), 75mA minimum, screw terminal connections  
**Dimmer Outputs:** 2 individual dimmer channels, each with independently assignable DMX channel and dimmer curve, screw terminal connections  
**Dimmer Technology:** MOSFET PWM (pulse-width-modulation), variable frequency carrier, 16,384 steps  
**Maximum Output Power per Channel:** 10A non-continuous, 6.5A continuous  
**Maximum Total Device Output Power:** 15A  
**RF Antenna:** hidden internal

## RC4Magic Series 2 DMX4dim Wireless Receiver-Dimmer

The **DMX4dim** is slightly larger than the **DMX2dim**, providing 4 low-voltage pulse-width modulation dimmers.

All other specifications are identical to the **DMX2dim**, including the per-channel and total device output power limitations.

Note that two **DMX2dim** units can deliver twice as much power as one **DMX4dim**, but one **DMX4dim** is smaller and easier to connect than two **DMX2dim** units.



### DMX4dim Specifications

**Dimensions:** 3.15" x 1.55" x 0.8" nominal (approx. 80mm x 40mm x 21mm)  
**Power Input:** 6VDC - 18VDC (12V typical), 75mA minimum, screw terminal connections  
**Dimmer Outputs:** 4 individual dimmer channels, each with independently assignable DMX channel and dimmer curve, screw terminal connections  
**Dimmer Technology:** MOSFET PWM (pulse-width-modulation), variable frequency carrier, 16,384 steps  
**Maximum Output Power per Channel:** 10A non-continuous, 6.5A continuous  
**Maximum Total Device Output Power:** 15A  
**RF Antenna:** hidden internal

**WIRING AND INSTALLATION OF BATTERIES, DIMMERS, AND LOADS MUST BE IN ACCORDANCE WITH APPLICABLE LOCAL AND NATIONAL ELECTRICAL CODES. Low voltage circuitry can be dangerous. RC4 Wireless devices and equipment are operated at the user's own risk and RC4 Wireless accepts no liability, either direct or consequential, resulting from the use of this equipment.**

### RC4Magic Series 2 RF Specifications

**Indoor/Urban Range:** 200' (66 m) typical, 300' (92 m) often achieved  
**Outdoor Line-of-Sight Range:** 300' (92 m) typical, 700' (213 m) or more often achieved, up to 1 mile (1.6 km) possible  
**Transmit Power Output:** up to 100 mW (20 dBm) EIRP in North America, limited to 10dBm output in Europe and Japan  
**Receiver Sensitivity:** -100dBm  
**Operating Frequency:** 2.4 GHz ISM band  
**Agency Approvals:** **RC4Magic** Series 2 radio modules are approved and certified for use in USA, Canada, Europe, Japan, and elsewhere.

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