Product Installation Guide

MAGNUM FIRST

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Single Channel Lighting Control Module (0-10V)
M9-USR-LM

1] Description

The Mx-USR-LM Lighting Control Module responds to a variety of wireless EnOcean devices to control and dim LED drivers, fluorescent ballasts, or other switchable loads. The Mx-USR-LM offers bi-directional, ON/OFF and 0-10V dimming control when combined with a wireless light switch or automatic shut-off when combined with a wireless occupancy sensor. Additionally, the Lighting Control Module can perform occupancy-based setback dimming and self-contained daylight harvesting functions. The Mx-USR-LM can be paired to compatible devices manually and for more sophisticated configuration, the MES software tool airConfig is available for download at **https://www.dropbox.com/s/mor2z812401nhti/airConfig_Setup.exe?dl=0**   For manual pairing instructions, please refer to the Mx-USR-LM Installation Guide.

2] Dimensions

61.95 mm

45.85 mm / 1.805"

TEMPERATURE PROBE

74.42 mm / 2.934"
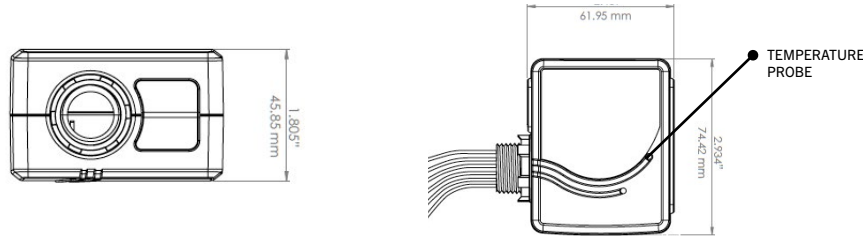
3] Technical Specifications:

Part Numbers (Frequency Dependant)	M9-USR-LM (902 MHz - North America) M8-USR-LM (868 MHz - Europe and China) MJ-USR-LM (928 MHz - Japan)
Range	150 feet (50-150 typical) / 45.72 m (15.24 m - 45.72 m)
EnOcean Profile	Magnum Proprietary Profile, A5-38-08 Type 0x02 Dimming
Input Voltage	100-277 VAC
Minimum Switched Voltage	100 V @ 10 A
Maximum Switched Voltage	277 V @ 10 A
Max Switched Power	3300W @ 277VAC
Temperature Range	32°F - 95°F (0° C - 35°C)
Relay Output	1 N.O. (normally opened) and 1 Common contact
Dimmer Output	0-10V, 30 mA (sinking drivers) 5mA (sourcing drivers)
Ambient Operating Temperature	0-35°C for 3300 W load @ 277 VAC (preliminary)
Accuracy (Metering)	0.5% (preliminary)
Dimensions	2.439" x 2.934" x 1.805" (61.95 mm x 74.42 mm x 45.85 mm)
Certifications	FCC (United States) SZV-TCM3XXX, IC (Canada) 5713A-TC-MXXX, CE, DLC

4] Equipment Needed for Installation

• Electrical tape   • Screwdriver   • Wire nuts

* For advanced configuration, additional equipment is required, including laptop, USB 300U (available for order from MES) and AirConfig, which is available for free download at http://download.magnumes.net

5] Planning for Installation

• Take a moment to prepare for installation and ensure optimal communications with other system components in the space
  • To assess signal strength prior to and during installation, you can utilize the following:
    - MES's free range testing tool "AirSpy", *email info@magnumfirst.com to request a copy of AirSpy.* Requires USB 300U.
    - If utilizing Mx-eBox (BACnet to IP) gateway, utilize BACnet point available for signal strength (RSSI)

• Always utilize a qualified installer

• Straighten antenna out and away from any surrounding metal

• Create separation distance between interfering electronics such as fluorescent tube ends, ballasts, electronic transformers, and motors. Avoid mounting inside of metal enclosures.

• Obstructions of metal, concrete and dense building materials will reduce the range. Mount higher and away from obstructions to maximize range.
In applications using HVAC units a Relay Contactor is required for the units per AMP rating.

If following the standard, manual pairing process, please refer to the "Learn In Procedure" section at the end of this document. If manual with default settings is the preferred method of commissioning, it is recommended this process be done prior to installation, unless access to buttons and device is possible.

For advanced configuration using AirConfig, install Mx-USR-LM as discussed and perform commissioning process with device installed. Make sure that device is still within wireless range.

6] Installation

COMMON APPLICATIONS:

WARNING: TO AVOID RISK OF FIRE, SHOCK, OR DEATH, TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND VERIFY THAT IT IS OFF BEFORE INSTALLATION BEGINS. MAKE SURE THAT IT REMAINS OFF UNTIL INSTALLA-TION IS COMPLETE. PLEASE BE AWARE THAT WITH THIS VERSION OF THE PRODUCT, IT IS POSSIBLE TO HAVE MULTIPLE BRANCH CIRCUITS FEEDING THE RELAY RECEIVER.
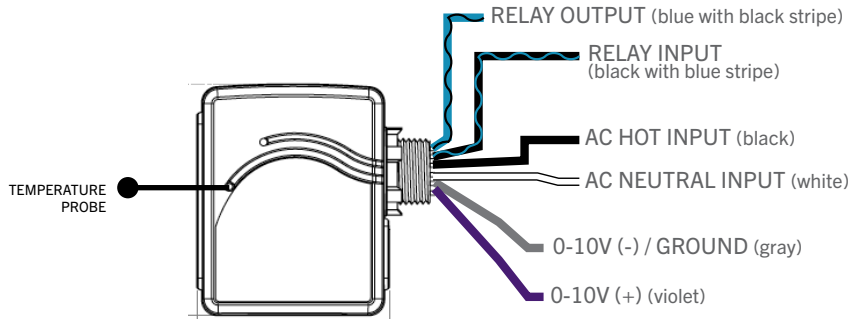
NOTE: Read the WARNINGS AND CAUTIONS section before beginning these installation options. Read all steps for this option before taking any action to install receiver.

1) For in-wall installation, a wiring box must be used. For ceiling installation make wire connections inside a junction box. Ensure that the temperature in the ceiling box will not exceed 50 degrees C. For best wireless signal performance install receiver in plastic box away from floor and away from metal objects.

2) Connect wires as shown in Figure A. Twist wire nuts on clockwise making sure no bare wires show. Wrap connections with electrical tape.

3) Stow all wires in wiring box.

4) Restore power and follow instructions under the "Setting Up Your Device via airConfig" section at the end of this document, or follow manual pairing procedures to use default settings.

5) To test that the device is working, press and release SW1. This will toggle ON/OFF. (If receiver is not working, review wiring and programming instructions).
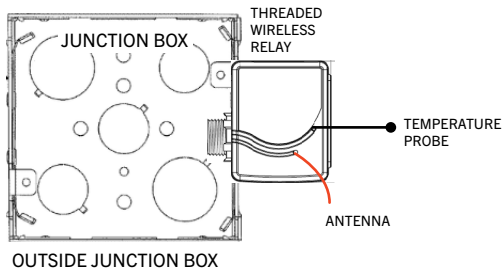
6) Finish any installation of fixture or wall switch.

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7] Wiring Diagrams

- RELAY OUTPUT (blue with black stripe)
- RELAY INPUT (black with blue stripe)
- AC HOT INPUT (black)
- AC NEUTRAL INPUT (white)
- 0-10V (-) / GROUND (gray)
- 0-10V (+) (violet)
- TEMPERATURE PROBE

8] Wireless Mounting Options

- THREADED WIRELESS RELAY
- JUNCTION BOX
- TEMPERATURE PROBE
- ANTENNA
- OUTSIDE JUNCTION BOX

9] Compatible Devices

• The Mx-USR-LM can be controlled using a variety of other devices, including:

- Mx-ML3 (Occ / Lux Sensor)
- Mx-EOSW (Wall Mounted Occ Sensor)
- Mx-SW2 (Wireless Double Rocker Switch)
- Mx-EDRP (Wireless Double Rocker Switch)
- Mx-EDWS (Wireless Window / Door Sensor)
- Mx-eBox (BACnet IP Gateway)
- Mx-EOSC (Ceiling Mounted Occ Sensor)
- Mx-SW1 (Wireless Single Rocker Switch)
- Mx-ESRP (Wireless Single Rocker Switch)
- Mx-MRC1 (Wireless Window / Door Sensor)
- Mx-ECKU (Wireless Key Card Switch)
- Mx-AP2 (Access Point)

10] Warnings & Cautions

• HIGH VOLTAGE: A qualified installer or electrician must install this device. Follow all applicable electrical codes for installation.

• Relays and receivers are intended for INDOOR use only, in dry locations with permanently installed fixtures

• This device is suitable for a circuit capable of delivering not more than 20 AMP maximum

• Be sure not to install this device in locations where the units are in close proximity to the light bulbs or other sources of heat, particularly with high wattage loads.

• When using relays to switch a motor, overload and over current protection sized for the motor load should be provided at the branch circuit feeder supplying the motor in accordance with the NEC or CEC, as applicable for the installation location

• The maximum over current protection required for the branch circuit supplying this product is 20 AMPS. When one or more motors are installed and not internally protected then an overload protective device sized at not more than 115% of the motor full load AMPS should be installed for each motor.

• When using devices to control motors and HVAC equipment, which don't respond well to the ON/OFF cycling that occurs in the "learn" mode, it is advised to configure the receivers without the motor or HVAC load connected. Instead, program the products in advance by connecting them to a light or to another load that is safe when toggling on and off.

11] Troubleshooting

PROBLEM	WHAT TO CHECK
Lamps/luminaires do not dim	Make sure the ballast is compatible with 0-10V dimming. If the ballast is dimmable, yet the light does not dim, check to ensure the Mx-USR-LM was wired properly and that the 0-10V output is also wired correctly.
Lighting load doesn't switch ON/OFF	Check to be sure connections to Lighting Control Module comply with the technical specifications listed on this document.

12] Warranty

U.S. Two-year Limited Warranty: Products purchased in the U.S.A. are warranted for two years from date of purchase by Magnum Innovations to be free of defects in materials and workmanship. In the event of such defect, product will be repaired promptly without charge or, at our option, replaced with a new product of equal or superior value if delivered to Magnum or an Authorized Service Center, prepaid, together with the sales slip or other proof of purchase date. This warranty excludes defects due to normal wear, abuse, shipping damage, or failure to use product in accordance with instructions. This warranty is void in the event of unauthorized repair or modification, or removal or defacing of the product labeling. The Magnum warranty specified herein covers material only and does not include labor or incidental costs associated with product replacement or repair.

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13] Ideal Product Placement

Utility Boxes / Relay Panels

Worst Case:
Antenna and receiver inside metal box
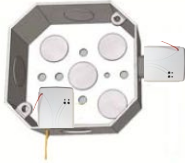
Better:
Receiver inside and antenna outside.

Best:
Receiver and antenna outside.

Junction Boxes

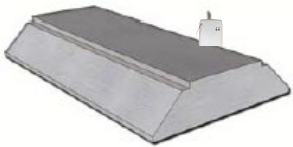**Worst Case:**
Antenna and receiver inside J-Box

Better:
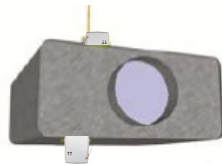Receiver inside and antenna outside.

Best:
Receiver and antenna outside.

Fluorescent Light Fixtures

Best:
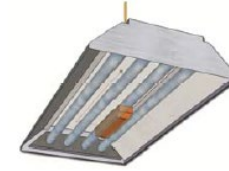Outside of fixture and away from "Keep Out" zones and ballasts

HVAC Ducts

Best:
Antenna and receiver on top or bottom (if ceiling is non-metal)

13] Ideal Product Placement: (continued)

Create separation distance away from interfering electronics
Fluorescent Lighting Ballasts

Worst Case:
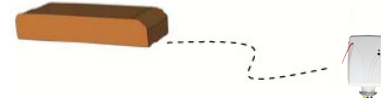Wireless receiver and antenna next to ballast or in "Keep Out" zones.

Better:
Maximize separation distance (between wireless receiver and ballast) and pull antenna outside of fixture.

Best:
Avoid placing wireless receiver and antenna within 6" of tube sockets

Lighting

Best:
Outside of fixture and away from "Keep Out" zones and ballasts

HVAC - PTAC Units

Best:
Antenna and receiver on top or bottom (if ceiling is non-metal)

14] Wireless Range Reducers

Wood, drywall, glass (uncoated, without metal)	0-10%
Brick, particle board	5-35%
Metal, ferro concrete, mirrors	10-90%

15] Wireless Range Testing

Site survey tools are available that can help fine-tune wireless communications. For example:

- Indicates wireless signal strength
- Evaluate longer range scenarios that might require enabling repeaters.

Please email info@magnumfirst.com or call 716 293-1588 to order a USB300U and to request a free download of AirSpy, Magnum's wireless signal testing tool.

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