PDS-70mr 24V

Power / data supply for MR LED lamps

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Power / data supply for MR LED lamps

PDS-70mr 24V is a power / data supply designed for LED lighting installations featuring MR LED lamps from Philips Color Kinetics. PDS-70mr 24V outputs a maximum of 72 W in Ethernet, DMX, and Pre-programmed versions.

- Universal power input range — PDS-70mr 24V accommodates input voltages ranging from 100 – 240 VAC. Short-circuit protection prevents device failure due to incorrectly wired fixtures.

- Convenient installation — Multiple standard-size conduit entries accommodate 1/2 in (13 mm) and 3/4 in (19 mm) US trade-sized conduit.

- Flexible control options — You can use PDS-70mr 24V DMX with any Philips Color Kinetics DMX or third-party controller, and PDS-70mr 24V Ethernet with any KiNET-compatible Ethernet controller. PDS-70mr 24V Pre-programmed features four built-in visual effects, allowing configurations without DMX or Ethernet controllers. PDS-70mr 24V Pre-programmed can function as a master controller, delivering data to additional power / data supplies in a run.

Rugged exterior-rated enclosure
Features a NEMA 4 (IP66) enclosure for installation in any dry, damp, or wet locations.

Specifications

Due to continuous improvements and innovations, specifications may change without notice.
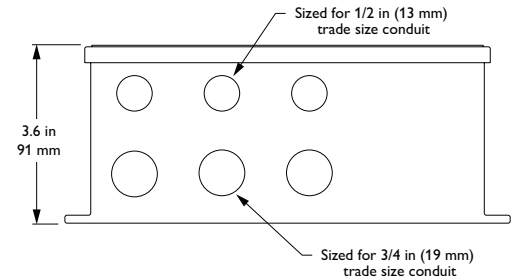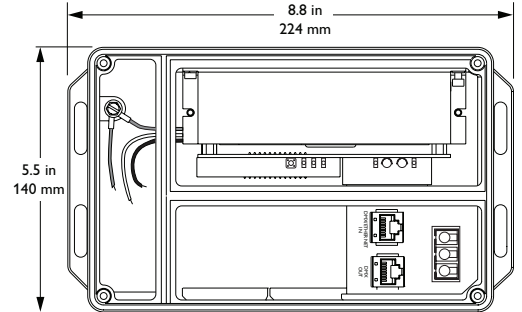
Item	Specification	Details	
Electrical	Input Voltage	100 – 240 VAC, auto sensing, 50 – 60 Hz	
	Maximum Input Current	1.7 A	
	Power Output	24 VDC, 72 W maximum	
	Fuse Rating	(1) 125 V, 4 A, Type F (fast-acting) fuse	
Physical	Dimensions (Height x Width x Depth)	3.6 x 5.5 x 8.8 in (91 x 140 x 224 mm)	
	Weight	4.5 lb (2.0 kg)	
	Construction	NEMA 4 enclosure, cast aluminum, with slots for surface mounting	
	Finish	Powder-coated gray matte	
	Connectors	Data	RJ-45 input and output connectors
		Power Output	2-pin terminal block main output 2-pin screw terminal auxiliary output
		Power Input	Line-neutral-ground cable, flying leads
	Temperature Ranges	14° – 104° F (-10° – 40° C) Operating 14° – 122° F (-10° – 50° C) Startup -40° – 176° F (-40° – 80° C) Storage	
	Humidity	0 – 95%, non-condensing	
	Cooling	Convection	
	Heat Dissipation	25% of total power input at maximum load	
Control	Data Input Source	Pre-programmed	Internal
		DMX	Philips Color Kinetics full range of DMX controllers, or compatible third-party controllers.
		Ethernet	Philips Color Kinetics full range of Ethernet controllers, or KiNET-compatible* third-party controllers.
	Maximum Fixture Run Length	14 MR LED lamps per device 50 ft (15.2 m) maximum cable length	
Certification and Safety	Certification	UL / cUL, CE, PSE	
	Classification	UL Class 2 power supply	
	Environment	Dry / Damp / Wet Location, IP66	

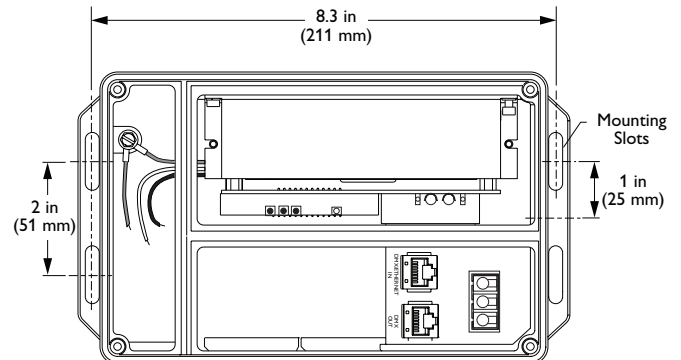*KiNET is the Ethernet lighting protocol from Philips Color Kinetics.

c(UL)us LISTED   CE   (P,S,E)

Included in the box

PDS-70mr 24V power / data supply
(2) Spare 125 V, 4 A, Type F (fast-acting) fuses
(4) Sealing plugs and rings 1/2 NPT
(4) Sealing plugs and rings 3/4 NPT
(1) 2-pin panel mount terminal block

8.8 in
224 mm

5.5 in
140 mm

Sized for 1/2 in (13 mm) trade size conduit

3.6 in
91 mm

Sized for 3/4 in (19 mm) trade size conduit

Overall Dimensions

Ordering Information

Item	Item Number	Philips 12NC
PDS-70mr 24V Pre-programmed	109-000018-00	910503700098
PDS-70mr 24V DMX	109-000018-01	910503700099
PDS-70mr 24V Ethernet	109-000018-02	910503700583

Use Item Number when ordering in North America.

8.3 in
(211 mm)

Mounting Slots

2 in
(51 mm)

1 in
(25 mm)

Mounting Dimensions

Installation

PDS-70mr 24V is a power / data supply designed for LED lighting installations featuring MR LED lamps from Philips Color Kinetics. PDS-70mr 24V outputs a maximum of 72 W in Ethernet, DMX, and Pre-programmed versions.

Owner / User Responsibilities

It is the responsibility of the contractor, installer, purchaser, owner, and user to install, maintain, and operate PDS-70mr 24V in such a manner as to comply with all applicable codes, state and local laws, ordinances, and regulations. Consult with the appropriate electrical inspector to ensure compliance.

Installing in Damp or Wet Locations

When installing in damp or wet locations, seal all junction boxes, power supplies, and other devices with electronics-grade RTV silicone sealant so that water or moisture cannot enter or accumulate in any wiring compartments, cables, fixtures, or other electrical parts. You must use suitable outdoor-rated junction boxes when installing in damp or wet locations. Additionally, you must use gaskets, clamps, and other parts required for installation to comply with all applicable local and national codes.

✱ Refer to the PDS-70mr 24V Installation Instructions for specific warning and caution statements.

Plan the Installation

To streamline installation and ensure accurate configuration, start with a layout or a lighting design plan that shows the physical layout of the installation and identifies the locations of all lighting fixtures, power / data supplies, controllers, switches, and cables.

DMX Configurations

PDS-70mr 24V DMX can be used in DMX networks. DMX is appropriate for relatively simple installations, or for installations in which groups of lights operate in unison — for example, for accent lighting, perimeter lighting, or cove lighting applications.

Typical DMX installations use a controller such as iPlayer 3, a Controller Keypad for turning the lighting system on and off and for triggering light shows, and one or more PDS-70mr 24V DMX devices. PDS-70mr 24V DMX devices can be connected in series to deliver DMX data from a single controller to all connected lights.

DMX Installation with iPlayer 3

iPlayer 3 Controller

Controller Keypad

Serial Cable

DMX Data

100 – 240 VAC

PDS-70mr 24V DMX

MR LED Lamps
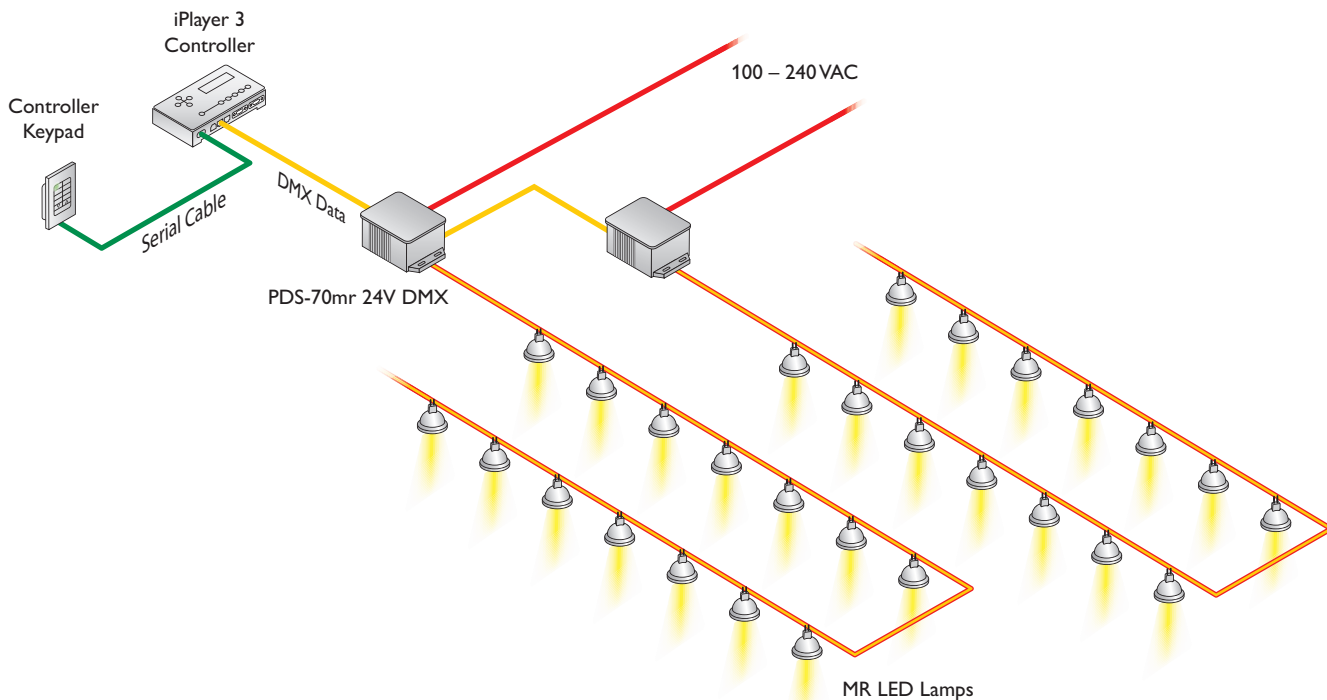
PDS-70mr 24V Pre-programmed versions can be used in DMX environments. They generate DMX control data from one of four pre-programmed lighting effects. You can use a pre-programmed device as a master controller to send DMX control data to additional PDS-70mr 24V DMX devices connected in series.

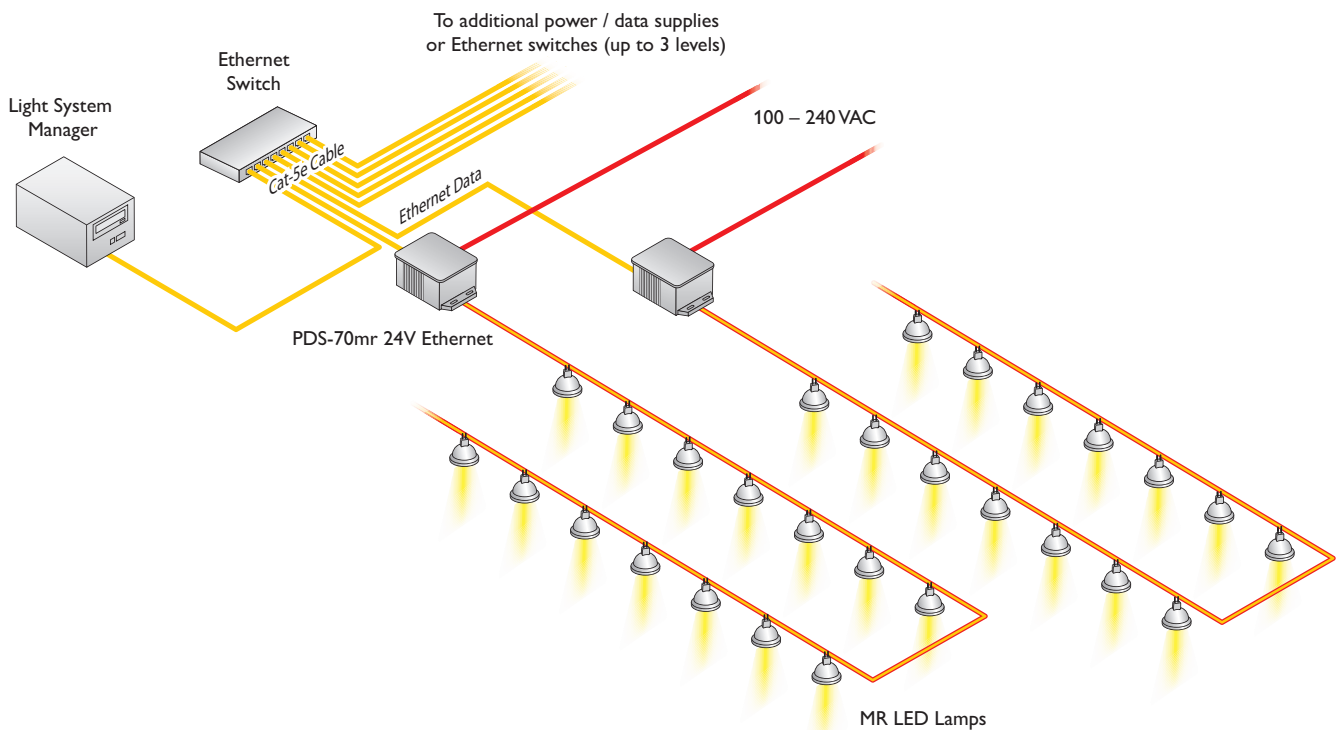DMX Installation with Pre-programmed Master

MR LED Lamps

PDS-70mr 24V
Pre-programmed

PDS-70mr 24V DMX
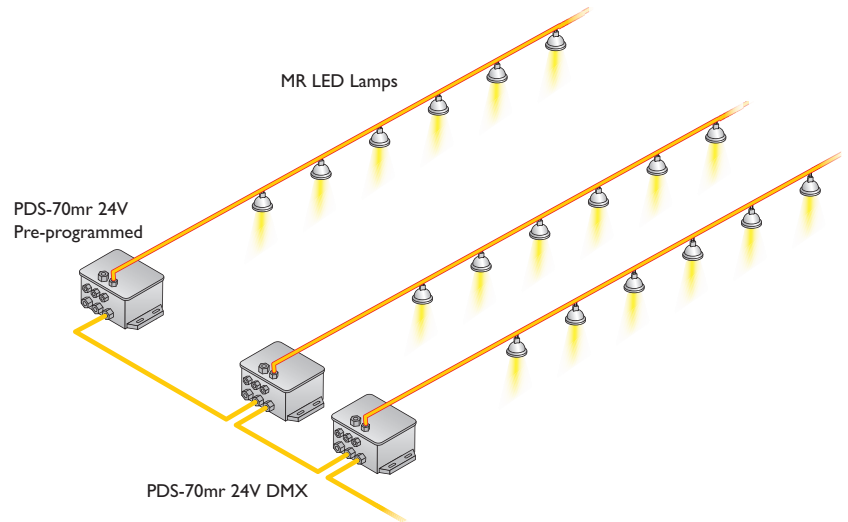
Ethernet Configurations

Because it is not subject to the DMX addressing limitations, Ethernet is the preferred environment for large-scale, color-changing light shows and video displays, both of which require large numbers of unique addresses.

Typical Ethernet installations use an Ethernet switch, an Ethernet controller such as Light System Manager, Ethernet Controller Keypads for push-button light show triggering, and one or more PDS-70mr 24V Ethernet devices. Connect each PDS-70mr 24V Ethernet device to an Ethernet switch port.

Ethernet Installation with Light System Manager

To additional power / data supplies
or Ethernet switches (up to 3 levels)

Ethernet
Switch

Light System
Manager

100 – 240 VAC

Cat-5e Cable

Ethernet Data

PDS-70mr 24V Ethernet

MR LED Lamps

Data and Power Run Length Maximums

When selecting mounting locations for the PDS-70mr 24V devices in your installation, keep these data run length maximums in mind:

• In Ethernet networks, maximum data cables lengths are 328 ft (100 m) between Ethernet devices without a repeater (for example, controller to switch, or switch to PDS-70mr 24V).

Ethernet maximum data run length
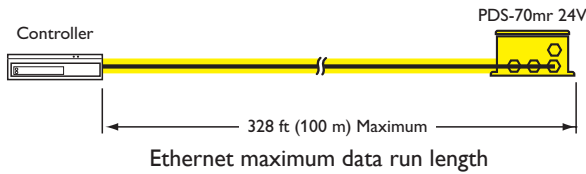
• In DMX networks, maximum data run lengths are 1000 ft (305 m). The maximum number of PDS-70mr 24V devices that can be connected in series is 32. We recommend using DMX repeaters for data run lengths that exceed the maximum length, as well as for runs of more than 32 PDS-70mr 24V devices connected in series.
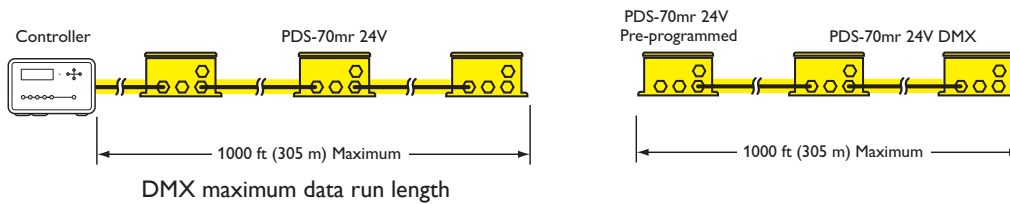
DMX maximum data run length

• Each PDS-70mr 24V device can support a maximum of 14 MR LED lamps. The fixture cable length cannot exceed 50 ft (15.2 m).
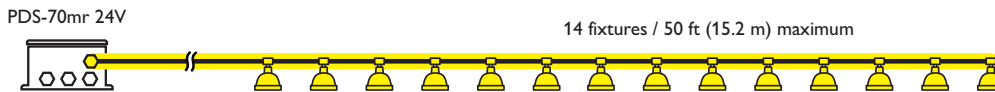
Inspect PDS-70mr 24V and Accessories

Carefully inspect the box containing PDS-70mr 24V and the contents for any damage that may have occurred in transit.

Assemble Additional Items

The following additional items are required to mount and connect the PDS-70mr 24V:

• 2 + ground copper wire for power connections, as required

• CAT 5e or better data cable, as required

• Power screwdriver (for mounting)

• Four screws suitable for the mounting surface

• Phillips screwdriver

• An 8 mm hex wrench or adjustable wrench, and a 5/16 in hex wrench

• Electronics-grade RTV silicone for installations in damp and wet locations

• Cable strain relief and other connectors as needed (water tight, if required)

• Wire strippers and other tools as needed

Included in the box

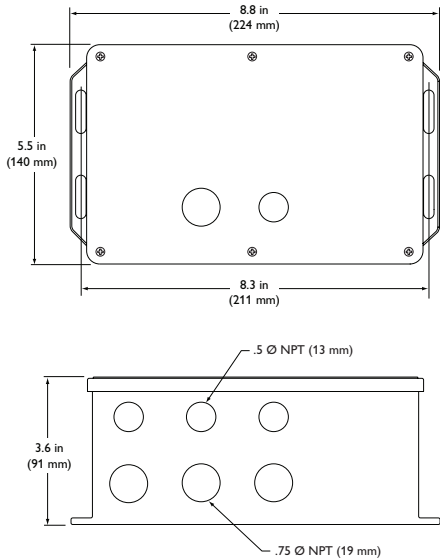| |
|---|
| PDS-70mr 24V power / data supply |
| (2) Spare 125 V, 4 A, Type F (fast-acting) fuses |
| (4) Sealing plugs and rings 1/2 NPT |
| (4) Sealing plugs and rings 3/4 NPT |
| (1) 2-pin panel mount terminal block |
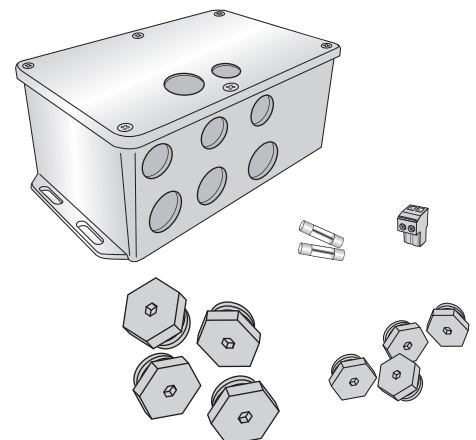
Mount PDS-70mr 24V

Make sure power is OFF before mounting PDS-70mr 24V.

1. Position the PDS-70mr 24V in its designated mounting location. Make sure the mounting location is flat, suitable for the mounting hardware, and clear of debris and other obstructions.

2. Using four screws suitable for the mounting surface, secure the PDS-70mr 24V to the surface using the mounting slots located at each end of the device.

✳ *Make sure that there is adequate space to make all connections to the top and side of the device.*

✳ *Make sure that the device is securely attached and free of excessive vibration.*

8.8 in
(224 mm)

5.5 in
(140 mm)

8.3 in
(211 mm)

.5 Ø NPT (13 mm)

3.6 in
(91 mm)

.75 Ø NPT (19 mm)

Data in, power / data out

Line power in

3. Identify which openings to use for power and data cables. Using the appropriate hex wrench or adjustable wrench, place the included sealing plugs and rings in the unused openings. Make sure that the sealing rings are seated correctly. Use electronics-grade RTV silicone if installing in damp or wet locations.

4. Torque the sealing plugs to approximately 19 in-lb (2.2 Nm).

5. Install and tighten cable connectors or conduit to manufacturer's specs in the remaining openings. Do not overtighten.

5/16 in Hex

RTV Silicone

RTV Silicone
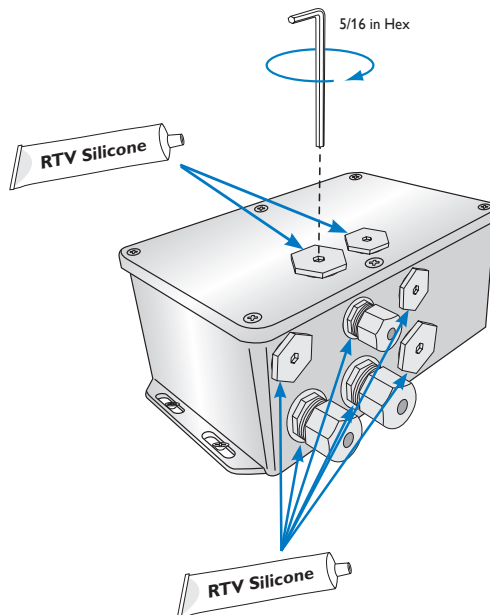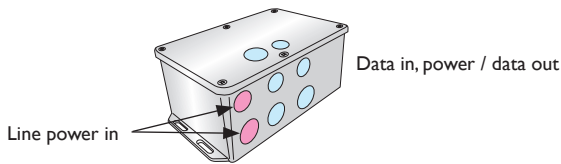
6. Using a Philips screwdriver, loosen the housing cover's six screws to open the PDS-70mr 24V housing.
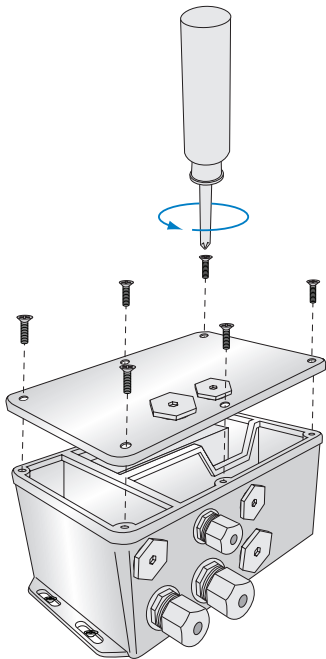
Make Data Connections

PDS-70mr 24V DMX devices have both DMX input and DMX output ports for connecting devices in series. The first device in a series receives input from a DMX controller, such as iPlayer 3.

PDS-70mr 24V Pre-programmed is also a DMX device, but it does not receive input from a DMX controller. Instead, it generates light show data using an on-board controller. PDS-70mr 24V Pre-programmed can act as a master device to pass data downstream to additional PDS-70mr 24V DMX devices connected in series.

PDS-70mr 24V Ethernet device has an Ethernet input to receive input from an Ethernet controller, such as Light System Manager. Use an Ethernet switch or hub to connect the controller and multiple PDS-70mr 24V Ethernet devices,

Data Connections: PDS-70mr 24V DMX

iPlayer 3
Controller

MR LED Lamps
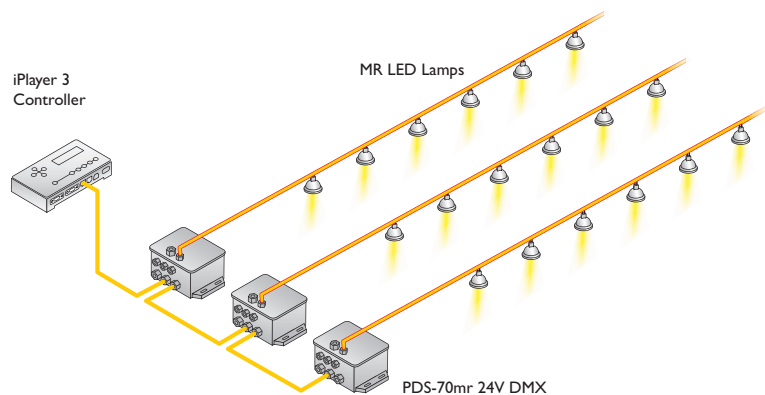
PDS-70mr 24V DMX

1. Using a CAT 5e or better cable, connect your controller's DMX output port to the DMX input port in the first PDS-70mr 24V DMX device in a series.

2. To connect PDS-70mr 24V DMX devices in series, connect a CAT 5e or better cable from the first device's DMX output port to the DMX input port in a second PDS-70mr 24V DMX device. Repeat as necessary. You can connect up to DMX 32 devices in series without a repeater.

DMX in

DMX out

First PDS-70mr 24V DMX

Next PDS-70mr 24V DMX

Out to next PDS-70mr 24V DMX

Out to next PDS-70mr 24V DMX

In from Controller (DMX)

In from PDS-70mr 24V DMX

Data Connections: PDS-70mr 24V Ethernet

Light System Manager Controller

MR LED Lamps

Ethernet Switch

PC
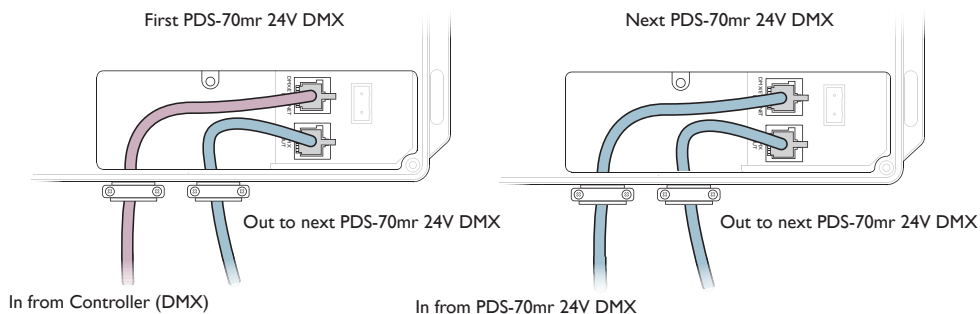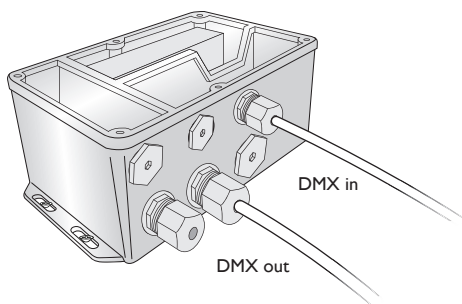
PDS-70mr 24V Ethernet
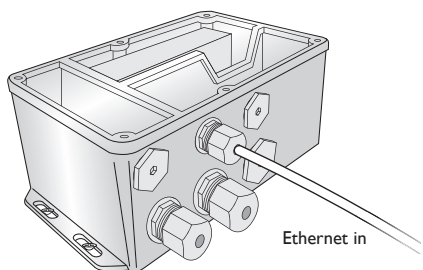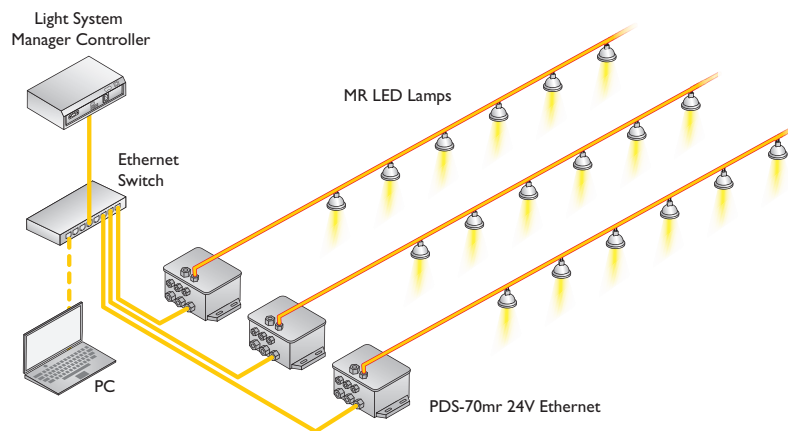
Ethernet in

Using CAT 5e or better cable, connect the Ethernet input port in the PDS-70mr 24V to an available port on an Ethernet switch connected to your lighting network. Repeat as necessary.

PDS-70mr 24V Ethernet

In from Controller (Ethernet)
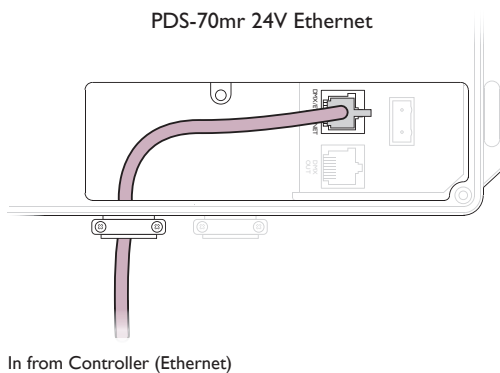
Data Connections: PDS-70mr 24V Pre-programmed
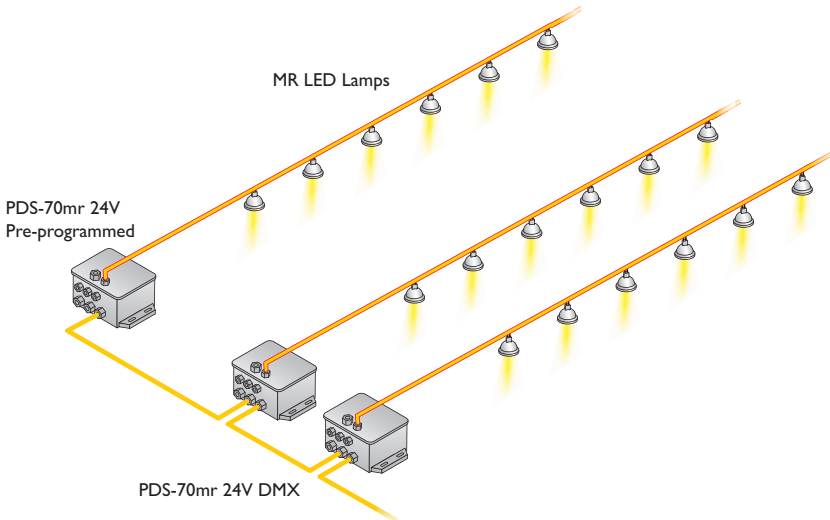
PDS-70mr 24V Pre-programmed devices do not accept data connections from external controllers. Instead, PDS-70mr 24V Pre-programmed devices act as controllers, using the on-board effects. PDS-70mr 24V Pre-programmed broadcasts DMX data to all connected MR LED lamps.

In installations where the number of lamps requires multiple power / data supplies, you can use a PDS-70mr 24V Pre-programmed device as a master controller, and connect multiple PDS-70mr 24V DMX devices to it in series. The PDS-70mr 24V Pre-programmed master broadcasts control data downstream to all connected PDS-70mr 24V DMX devices.

To connect PDS-70mr 24V DMX devices to a PDS-70mr 24V Pre-programmed device in series, connect a CAT 5e or better cable from the PDS-70mr 24V Pre-programmed device's DMX output port to the DMX input port in a PDS-70mr 24V DMX device. You can connect additional PDS-70mr 24V DMX devices in series using their DMX output and input ports. You can connect up to 32 DMX devices in series without a repeater.
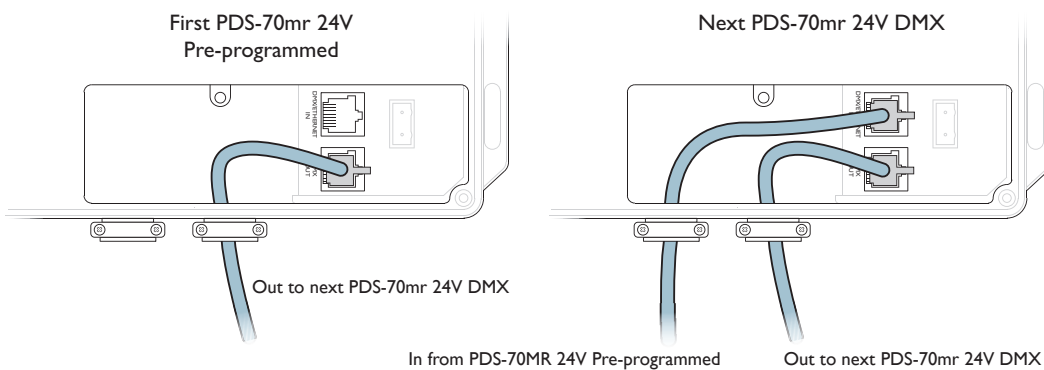
Connect the PDS-70mr 24V to Line Power

Make sure power is OFF before connecting to line power.

1. Pull an 8 – 18 AWG (8.37 – 0.823 mm²) stranded or solid power cable from a mains power source to a PDS-70mr 24V device. Strip at least .38 in (10 mm) of insulation from the wires.

2. Pull the power cable through one of the power openings and into the power connection chamber inside the PDS-70mr 24V housing. Pull at least 6 in (152 mm) of wire into the chamber. If necesasry, use conduit as required by local electrical codes.

3. Using wire nuts, connect line, neutral, and ground to the power / data supply's flying leads.

Line power in

UL / cUL

L N ⏚

CE

L N ⏚

Connect Fixtures to the PDS-70mr 24V

Make sure power is OFF before connecting fixtures.

1. Pull a 14 – 18 AWG (2.08 – 0.823 mm²) stranded or solid 2- or 3-conductor fixture cable from an MR16 lighting track, rail, or pendant through one of the power / data out openings on the side of the PDS-70mr 24V housing.

2. Using a small flathead screwdriver, loosen the two captive screws on the front of the 2-pin panel mount terminal block.

3. Insert the fixture cable wires into the 2-pin panel mount terminal block's wire entry slots.

4. Tighten the captive screws on the front of the 2-pin panel mount terminal block.

5. Insert the 2-pin panel mount terminal block into the fixture output port inside the PDS-70mr 24V housing.

✳ *Each PDS-70mr 24V device can support a maximum of 14 MR LED lamps. The fixture cable length cannot exceed a total of 50 ft (15.2 m) per device.*
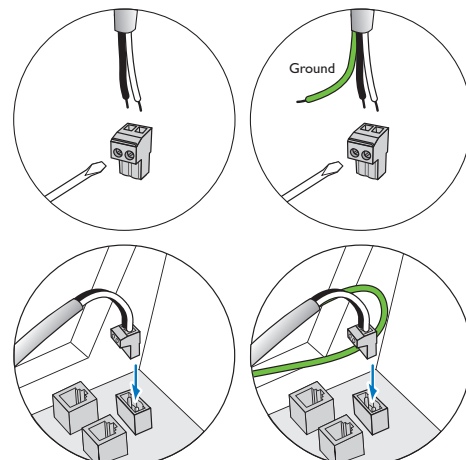
Ground

6. If using a ground wire, attach it to the ground post with a screw.
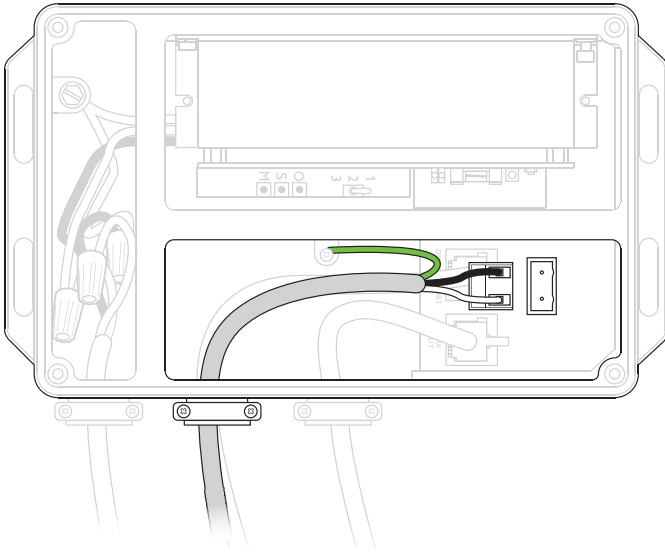
Configure Effects (Pre-programmed Only)

PDS-70mr 24V Pre-programmed lets you display one of four configurable effects on lamps without a controller. You use the toggle switch and buttons inside the PDS-70mr 24V Pre-programmed housing to select an effect and set its options, so you must configure your effect before closing and sealing the device.

Although a PDS-70mr 24V Pre-programmed device cannot receive signals from an external controller, it can act as a master controller, sending DMX control data downstream to additional PDS-70mr 24V DMX devices via its DMX OUT port.

Make sure the power is ON before configuring effects.

PDS-70mr 24V Pre-programmed effects are designed for use with iColor MR lamps. These effects can also work with iW MR lamps to create shows that use varying hues of white light. For iW MR lamp installations, the 2700 K color temperature maps to the red channel, 4000 K maps to the green channel, and 5700 K maps to the blue channel.
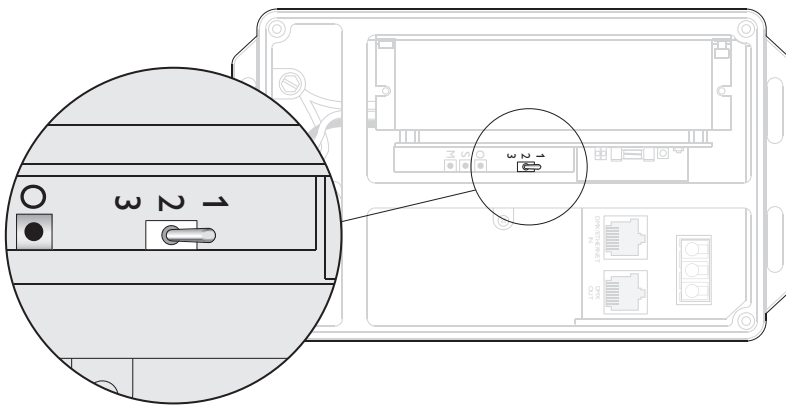
1. Locate the toggle switch inside the PDS-70mr 24V Pre-programmed housing, and set the switch to position **1**.

2. Locate the option buttons inside the PDS-70mr 24V Pre-programmed housing.

3. Press the Mode button to cycle through the effects (Rainbow, Random Color, Colorwash, Fixed Color, in that order).
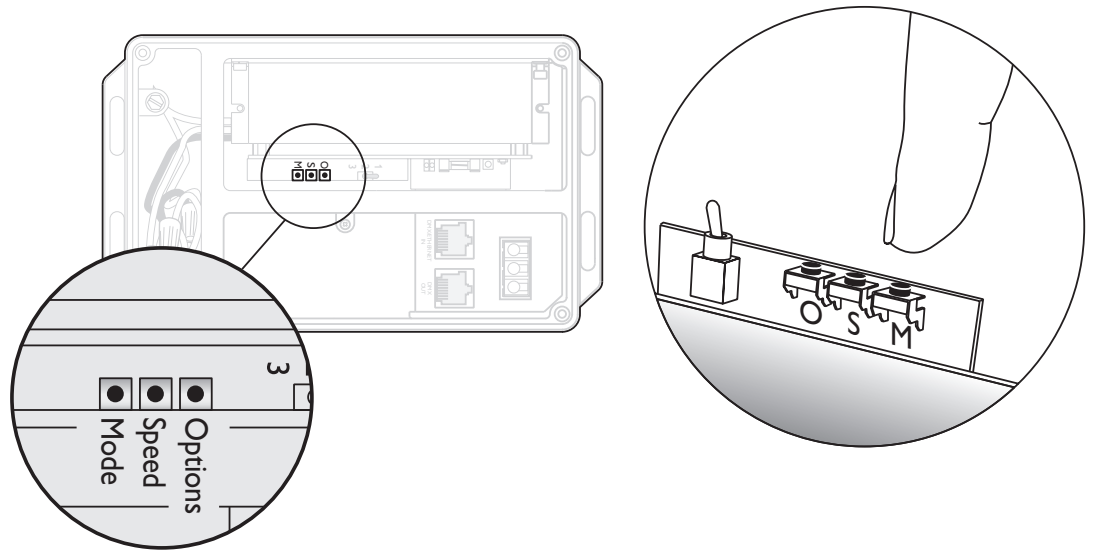
4. Once you've selected an effect, use the Options and Speed buttons to configure the effect (refer to the tables below and on the following page).
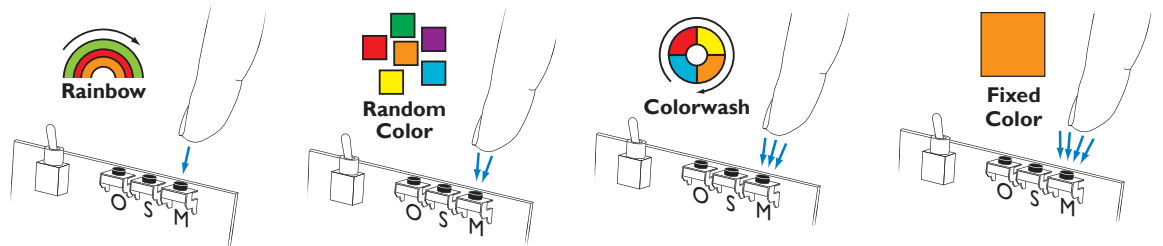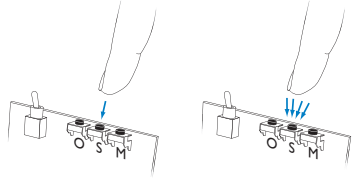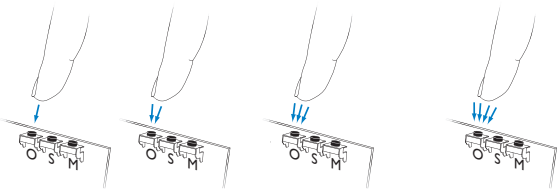

Pre-programmed Effects

Mode Button	Description	Speed Button	Options Button
Rainbow	Produces a smooth transition through the color spectrum. Colors appear to follow each other from fixture to fixture.	Cycles through four effect speed settings	Cycles through four pixel width settings, then reverses direction and decreases widths
Random Color	Produces a sequence of randomly generated solid colors simultaneously on all fixtures	Cycles through four effect speed settings	Toggles between snap and fade transitions
Colorwash	Produces a smooth hue transition on all fixtures simultaneously, progressing through the color spectrum	Cycles through four effect speed settings	Reverses effect direction
Fixed Color	Displays a solid color	Press and hold to cycle through the RGB color range	—

Pre-programmed Effect Speed and Other Options
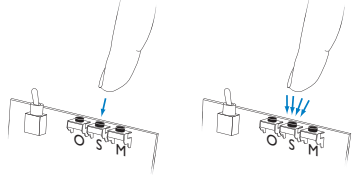
Rainbow

Speed

Pixel width

Random Color

Speed

Snap or fade transition
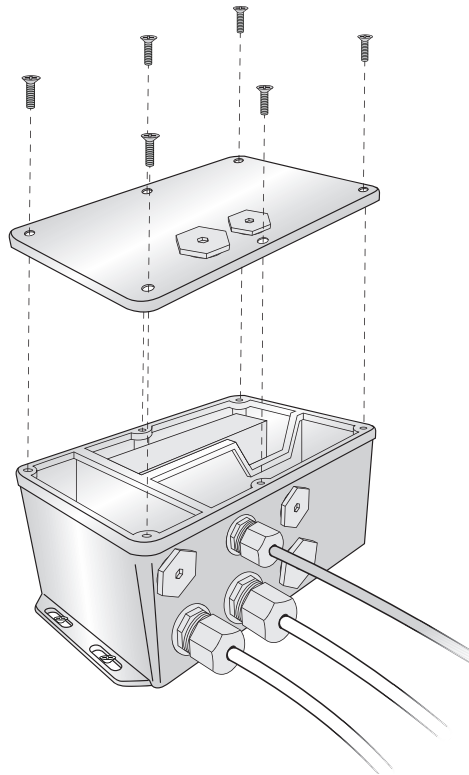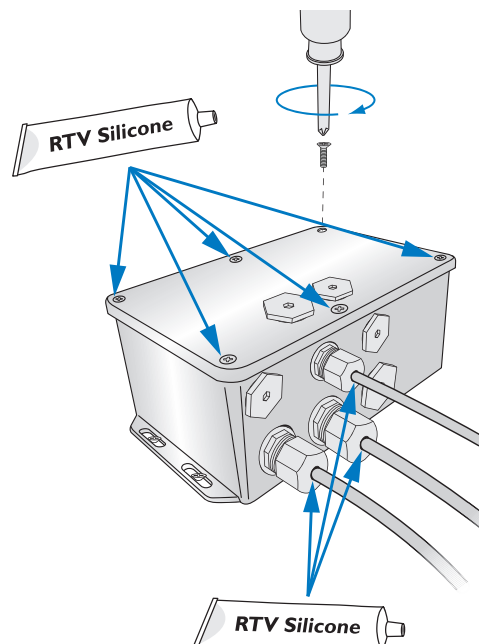
Colorwash

Speed

Direction

Fixed Color

Secure Connections and Cover

1. Replace the cover, ensuring that the gasket is seated properly and that no wires are pinched.

2. Attach the cover with the six included screws. Tighten screws to 8 to 10 in-lbs (1 Nm).

3. If installing in a wet or damp location, seal all screws and connections with electronics-grade RTV silicone.

Replacing the Fuse

PDS-70mr 24V is fused to protect the device from spikes in current. Always replace a blown fuse with a 125 V, 4 A, Type F (fast-acting) fuse.

1. Make sure that power is OFF.

2. Using a Phillips screwdriver, unscrew the six screws holding the cover in place.

3. Remove the blown fuse from its metal clips next to the power and data input and output ports.

4. Replace the fuse with a new 125 V, 4 A, Type F (fast-acting) fuse.

5. Replace the cover, ensuring that the gasket is seated properly and that no wires are pinched.

6. Attach the cover with the six included screws. Tighten screws to 8 to 10 in-lbs (1 Nm).

7. If installing in a wet or damp location, seal all screws and connections with electronics-grade RTV silicone.