This guide describes the requirements for, and the steps involved in the permanent installation of all Pathway Connectivity Pathport® DMX/RDM Gateways. Some familiarity with DMX512 and Ethernet lighting networks is assumed.

This guide covers the following model numbers: PWPP WM P1, PWPP TM P1, PWPP HH P1, PWPP WM P2, PWPP RM P4, PWPP RM P8, PWPP DIN P1, PWPP DIN P2, and PWPP DIN P4 models. It may also cover certain custom Pathport models.

## NETWORK REQUIREMENTS - WIRING & LAYOUT

Network wiring should follow standard Ethernet wiring rules and be installed by a qualified person. Category 5 wire or better is required and should be certified under the TIA/EIA-568 standard. Without certification, it may be impossible to determine the source of any problems.

Good wiring practice prohibits the termination of building wire with a male RJ45 plug or the "hard-wiring" of data lines to end devices. PWPP WM P2 gateways ship with an in-line female RJ45 mini-jack, similar to a punchdown connector, as well as a short male-to-male RJ45 jumper. The jumper is then connected to the gateway.

The in-line jack and jumper are available an accessory package for the PWPP WM P1.

## NETWORK REQUIREMENTS - PoE

PWPP DIN P1, P2, and P4, as well as PWPP RM P4 gateways are designed to utilize the IEEE 802.3af standard, commonly called Power-over-Ethernet (PoE). PoE-enabled switches, such as Pathway VIA entertainment-class switches, are readily available. Their use is strongly recommended to simply installation and prevent the need for separate power cabling.

## PRE-CONFIGURATION

Pathport gateways retain their IP and patch configuration in non-volatile memory. Significant on-site time savings can be attained by configuring the Pathport name and network information in the shop. With a computer and a switch, create a simple network mock-up.

Use Pathscape software to add the devices to a **Security Domain** and enable **Unsecured Protocols** if needed (see Pathscape manual for details on Security).

Configure the individual Pathport and port names, and to set IP addresses and basic patches. Put temporary labels on the Pathports with the fit-up location, then repackage them for shipping.

## DMX CONNECTOR WIRE TERMINATIONS

RS485 wire color is manufacturer-specific. Use the connector to determine pin number for each wire. We suggest Belden 9829 or 9842.

| XLR Pin | Standard RS485 Wire Conductor |
|---------|-------------------------------|
| Pin 1 | Shield |
| Pin 2 | Data - (pair 1 complement) |
| Pin 3 | Data + (pair 1 true) |
| Pin 4 | Not connected |
| Pin 5 | Not connected |

When Cat5 (or higher) wire is used for DMX transmission, the following chart is used instead:

| DMX over Cat5e/Cat6 | | |
|---------------------|----------|----------|
| **Wire Color and #** | **Function** | **XLR Pin #** |
| White/orange (1) | Data + (pair 1 true) | 3 |
| Orange (2) | Data - (pair 1 complement) | 2 |
| White/green (3) | Unassigned | - |
| Green (6) | Unassigned | - |
| Blue (4) | Unassigned | - |
| White/blue (5) | Unassigned | - |
| White/brown (7) | Data signal common for Pair 1 | 1 |
| Brown (8) | Unassigned with IDC Connectors | 1 |

This chart is based on ANSI standard E1.27-2 and is intended for permanently installed DMX cabling. The connection of DMX equipment to non-DMX equipment such as Ethernet switches may result in equipment damage.

To help prevent this possibility, unless the wires have another known usage in the existing installation, wires 3 through 6 should be capped and turned back.

The use of RJ45 connectors for DMX equipment should be restricted to patch bays in access controlled rooms and not used for the connection of portable equipment.

Pre-configured PWPP DIN cards use Black as common, green as D- and red as D+.

## IN-LINE JACK INSTALLATION

Good wiring practice does not permit the hard-wiring of data lines to end devices, such as Pathports.

To facilitate proper practice, PWPP WM P2 gateways ship with an in-line female RJ45 mini-jack, similar to a punchdown connector, as well as a short male-to-male RJ45 jumper to connect the jack to the node. (The jumper and jack are available as an accessory package for the PWPP WM P1.)

First determine if the installation is using the TIA568A or TIA568B wiring scheme. Strip back the outer insulation jacket of the building wire no more than ¾". Untwist the pairs, trim them to the same length but do not remove insulation from the individual wires. Slip the individual wires into the clear plastic guide piece, following the color coding scheme on the sticker. Position the guide piece onto the connector half of the jack. Press down firmly or gently apply pressure with a pair of pliers until the two pieces click together. The mini-inline connector is removable, if necessary.

## PATHPORT WALL-MOUNT 2-PORT (PWPP WM P2)



Disconnect all power before proceeding with the installation. If the Pathport has been pre-configured, check the temporary label to ensure the Pathport is being installed in the correct location.

PWPP WM P2s should be installed in standard two-gang masonry deep backboxes (ears in) for flush-mounting or, for surface mounting, in Pathport surface mount backboxes, part number PWACC WMP2. Use of other surface mount backboxes is not recommended. Check the backbox for obstructions or any foreign material. The backbox should be clean and empty of debris. Install the in-line Ethernet jack provided, if necessary.

Attach the Pathport trim ring to the backbox with the 4 screws provided. Do not over-tighten or distort the shape of the trim ring.

Inspect the Pathport and make sure all components, including the printed circuit boards, are secure. Note that it is normal to see exposed metal on the mating connectors.

If the backbox contains an RJ45 female punchdown connector, use the male-to-male jumper (included) to connect it to the node. Otherwise, plug the male RJ45 pigtail directly into the connector on the back of the node. Attach the green ground wire to the ground screw in the backbox.

If local power is required for the Pathport, see the note on local power at the end of this guide.
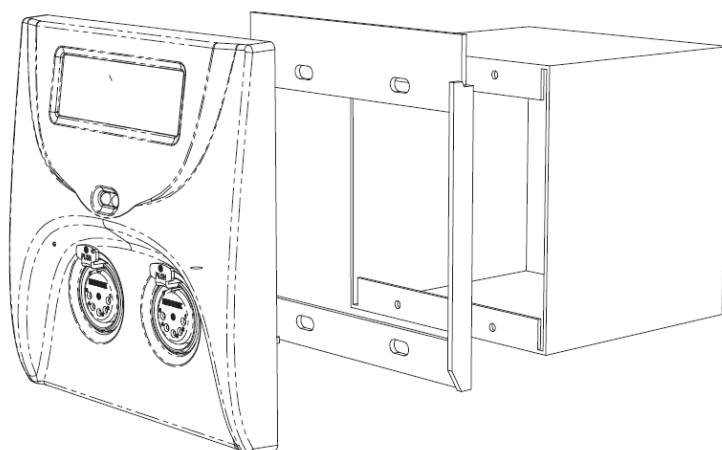


Gently insert the Pathport straight into the backbox, lifting it slightly so that is high in the backbox. Once all the way in, lower it until the tabs at the top of the trim ring take hold of the face plate. Once the top of the gateway's faceplate is retained, swing the bottom in tight to the wall. Make sure no wiring or connectors are pinched, excessively bent or stressed. Using a #0 Phillips driver (not included), tighten the two setscrews provided, one on each side of the gateway's face, to complete installation. If the Pathport has shipped with hex-head set screws, instead use a 1/16" Allen key (not provided)

The Pathport is ready to be powered up.

## PATHPORT WALL-MOUNT 1-PORT (PWPP WM P1)



Disconnect all power before proceeding with installation.

PWPP WM P1 single-port gateways are designed to be installed in standard masonry deep backboxes (ears in) for flush mounting, or deep (minimum 58mm or 2.25") surface mount backboxes.

If the Pathport has been pre-configured, check the temporary label to ensure the gateway is being installed in the correct location.

PWPP WM P1s can be permanently set to a specific DMX universe, 1 through 4, by use of a jumper on the back edge of the circuit board. If the system designer has not given specific instructions about the setting, then leave the jumper in the NET position, and configure standard or custom patches using Pathscape.

Because PWPP WM P1s do not have a front panel display, if you are installing multiple gateways it's a good idea to maintain a log of serial numbers. The serial numbers are exposed when the gateways are discovered in Pathscape which is where they will be patched. If the devices are easily visible from where you run Pathscape, use the "Identify" feature, which will blink the blue NET LED and the green DMX LED on the selected gateway.

Once this information is recorded, check the backbox for obstructions or foreign material. The backbox should be clean

and empty of debris. Inspect the PWPP WM P1 and make sure all components are securely fastened and that the printed circuit boards are intact.

If the back backbox contains an Ethernet RJ45 female punchdown connector, use a male-to-male jumper to connect it to the PWPP WM P1. Otherwise, plug the male RJ45 pigtail directly into the connector on the back of the PWPP WM P1. Attach the green ground wire to the ground screw in the backbox.

Gently insert the PWPP WM P1 straight into the backbox and screw it into place with the long mounting screws provided. Place the cover plate over the installed PWPP WM P1 and use the two short screws to fasten the cover plate. Do not over-tighten these screws.

The PWPP WM P1 is ready to be powered up.

## PATHPORT DIN-MOUNT (PWPP DIN P1/P2/P4)



Disconnect all power before proceeding.

Because PWPP DIN models are intended for installation within enclosures, if you are installing multiple gateways it's a good idea to maintain a log of serial numbers. The serial numbers are exposed when the gateways are discovered in Pathscape which is where they will be patched. If the devices are easily visible from where you run Pathscape, use the "Identify" feature, which will blink the blue Identify LED on the selected gateway.

Securely mount DIN rail (if not already installed in the enclosure). Hook the upper slots on the back of the plastic extrusion to the DIN rail and then gently but firmly press on the bottom front corners of the extrusion to snap the module onto the rail. Do NOT press directly on the PCB card itself.

Attach the DMX wiring to the terminal strip output connector(s). If the PWPP DIN is using an auxiliary power supply, connect the terminal strip. Observe DC polarity.

Attach the network cable to the RJ45 connector marked Ethernet. The Pathport is ready to be powered up. Both auxiliary power and PoE can be connected simultaneously without damaging the PWPP DIN.

PWPP DIN P1's may be set permanently to a specific DMX universe, 1 through 4, by use of a DIP switch block on the circuit board. If the system designer has not given specific instructions about this setting, all switches should be left in the OFF position, and configured with Pathscape.

## PATHPORT PORTABLE 1-PORT (PWPP DT/TM P1)



The Portable 1-Port Gateway may be powered using Power-over-Ethernet or a 24VDC supply with a 2.5mm center-positive barrel connector.

To attach the hanging bracket, remove the top two screws from either end of the portable enclosure (four screws altogether), position the hanging bracket over the top of the enclosure, then use the same screws to attach the bracket to the enclosure.

The hanging bracket has a 1/2" (12.5mm) hole suitable for a C-Clamp or other hanger (not included).

## PATHPORT HAND HELD (PWPP HH P1 XLR5F)

The PWPP HH P1 XLR5F operates on Power-over-Ethernet during normal operation, but may be configured using power from a 9V battery (included). Note that when battery powered, the device will shut down when idle after a short time to conserve battery life.

Once connected to a PoE source, the PWPP HH P1 XLR5F is ready for use.

It may be configured using its front panel or with Pathscape over the network.

## PATHPORT RACK-MOUNT 4-PORT (PWPP RM P4)
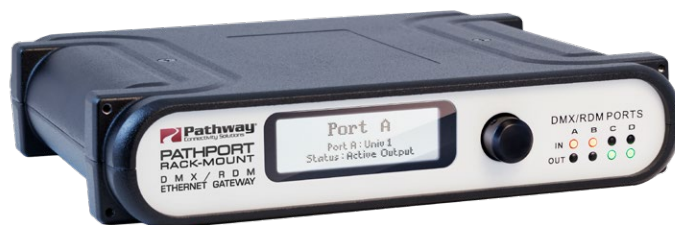


The PWPP RM P4 operates on Power-over-Ethernet or an auxiliary 24 or 48 VDC supply with a 2.5mm center-positive barrel connector (supply not included).

Once powered up, the PWPP RM P4 is ready for use. There is no on/off switch.

The PWPP RM P4 is designed for installation in a standard EIA 19" rack, with the LCD and encoder facing out. Attach the rack ears (included) to either side of the enclosure using the Phillips screws provided (two per ear). Attach the PWPP RM P4 to the rack using standard rack screws (not included).

A joiner is included to allow two PWPP RM P4s to be installed side-by-side in 1RU of rack space. Wall (PWACC WMSM) and truss mount (PWACC TMSM) adapters are available as accessories.

**See the Pathscape website under "Pathport Rack-mount" to download the Product Manual for additional information.**

## PATHPORT RACK-MOUNT 8-PORT (PWPP RM P8)



The PWPP RM P8 operates on wall power, accepting an input voltage between 100-240VAC at either 50 or 60 Hz. The AC outlet shall be near the equipment and shall be easily accessible. There is no on/off switch. This equipment relies on building installation overcurrent protection.

Once powered up, the PWPP RM P8 is ready for use.

The PWPP RM P8 is designed for installation in a standard EIA 19" rack, with the LCD and encoder facing out. Attach the rack ears (included) to either side of the enclosure using the Phillips screws provided (two per ear). Attach the PWPP RM P8 to the rack using standard rack screws (not included).
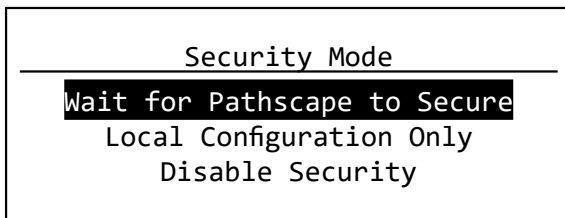
Wall (PWACC WMLG) and truss mount (PWACC TMLG) adapters are available as accessories.

**See the Pathscape website under "Pathport Rack-mount" to download the Product Manual for additional information.**

## IMPORTANT - SECURITY MODE (RACK-MOUNT MODELS)

**PWPP RM P8 and PWPP RM P4 devices running firmware V6.1 and later** will show a **Security Mode** screen when first powered on.

**Choose the Security Mode** from the front panel using the encoder knob.

```
            Security Mode
Wait for Pathscape to Secure
     Local Configuration Only
        Disable Security
```

If adding to a Security Domain in Pathscape, no input here is needed. Open **Pathscape** on a PC on the same network as the gateway and add it to a **Security Domain**.

If using the gateway from the front panel only, select **Local Configuration Only** (Read-Only) mode. The device will only be configurable from the Front Panel; configuration from Pathscape is disabled.

If **opting out of Security features**, select **Disable Security**. The device will be configurable using Pathscape from any PC on the network (even by unauthorized parties), as well as the front panel.

The system is now ready for configuration and testing.

**See PWPP RM P8 or PWPP RM P4 manual for further details.**

## IMPORTANT - UNSECURED NETWORK PROTOCOLS

Due to new cybersecurity laws, all Pathport devices shipped after January 1, 2020 have security properties enabled. This means that by default, the device is not set up to receive unsecured network protocols such as Art-Net, E1.31 sACN, ShowNet, NET2 or Pathport Protocol.

**You must add the Pathport to a Security Domain using Pathscape before configuration and use.**

Pathway ssACN (Secure sACN) is enabled by default.

To use the above unsecured protocols, open Pathscape. In the Pathport base device properties, under the **Network DMX Receive Protocols** section, click the **Allow Unsecured RX** checkbox.
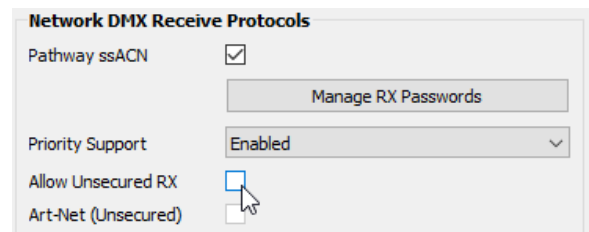


Once checked, you may select the network protocol(s) to receive.
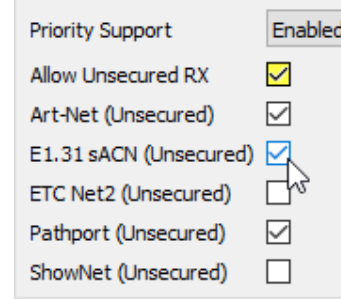


For further information, please see the following sections in the **Pathscape** manual: **Security**, **Pathport Properties > Network DMX Receive Protocols** .

## NETWORK PROTOCOLS (RACK-MOUNT MODELS)

**You must select a Security Mode and manually enable unsecured protocols before use.**

If the device is set to **Local Configuration Only** (Read-Only) mode or security is **Disabled**, Pathway ssACN is not available for use.

If the device is **secured via Pathscape and part of a Security Domain**, Pathway ssACN (Secure sACN) is enabled by default, all others must be manually enabled.

Enable desired protocols in the same manner as shown above.

Devices set to **Local Configuration Only** mode must enable protocols using the front panel encoder and display.

**See the respective PWPP RM P8 or PWPP RM P4 manual for instructions on using the front panel display and encoder for menu navigation and configuration of settings.**

## LOCAL POWER

All PWPP WM P1, PWPP WM P2, PWPP RM P4 and PWPP DIN models may be connected to an external power supply when Power-over- Ethernet is not available. Each Pathport will require a supply between 18 and 50VDC and consume no more than 8 watts of power.

For PWPP WM P1, PWPP WM P2 and PWPP RM P4 in portable applications, we suggest power supply catalog number PWPWR WW BARL 24W 24VDC.

For PWPP DIN we suggest catalog number PWPWR DIN TERM 50W 24VDC for use in North America.

With the power supply turned off, connect the bare wire ends to the 2-wire terminal block (included). Slip the block over the pins marked + and -, observing polarity.

Check all wiring, then connect the power supply to the mains power. The AC connection required should be provided in accordance with local regulations.

## CONFIGURATION

Pathport configuration is done with **Pathscape** software or through the front panel user interface on some models. Please refer to the Pathscape manual, or the individual model's manual, for instructions on device configuration.

## OPERATING ENVIRONMENT

All Pathport Gateways are designed for indoor use in a dry location. To maximize equipment life and minimize unreliability and sudden failure, the following environment should be maintained:

- Ambient Operating temperature: 14°F to 113°F (-10°C to +45°C) [DIN models]
- Ambient Operating temperature: 14°F to 122°F (-10°C to +50°C) [All other models]
- Relative humidity: 5 – 95%, non-condensing
- General conditions: clean, dust-free

## WARNING

The AC socket outlet (if applicable) shall be installed near the equipment and shall be easily accessible.

This equipment relies on building installation primary overcurrent protection.

Except for the IEC chassis plug marked for AC input on the PWPP RM P8, all ports on all Pathport gateways are to receive low voltages only.

All ports intended for DMX512 or other EIA485 signals shall not be connected to anything other than low voltage signal sources or receivers.

Attaching anything other than low voltage sources to the data ports may result in severe equipment damage, and personal injury or death.