PD-65XXG PoE Multiport Series User Guide

Introduction

Microchip's family of Power over Ethernet (PoE) Midspans PD-65xxG series inject power over data-carrying Ethernet cabling.

PD-6512G/6524G Midspans support 12 and 24 ports in a 10/100/1000BaseTx Ethernet network respectively, over TIA/EIA-568 category 5/5e/6 cabling. The PD-65xxG family Midspans offer remote network management capabilities as Simple Network Management Protocol (SNMP) v1/v2/v3, web interface for easy configuration and status report, Telnet and SSH, SecureWeb (SSL), and more. DC power is supplied over Ethernet cable pin pairs 7/8 and 4/5 to terminal units.

PoE Midspan powers devices that are PoE enabled or equipped to receive PoE. These devices are called PDs. Midspan devices can power non-PoE network devices by using a Microchip's external Power-Splitter, which appears as a PD to the Midspan. Incoming power and data are split into two separate connectors. One connector provides the data, while the other connector provides power. Contact your Microchip representative for more information about the product.

PoE Midspans offer the following key features:

- Safe and reliable power over an existing Ethernet infrastructure.
- **Add Power Only** option in case remote device is PoE PD compliant.
- Eliminates the need for AC outlets, local UPS, and AC/DC adapters near PDs.
- Optional remote Network Management over SNMPv1/v2/v3, web control, SecureWeb (SSL), Telnet, SSH, and more.
- Safe solution that protects network infrastructure.
- Standard compliant: IEEE® 802.3af.

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1. Standards and Safety Guidelines

The following sections mention the standard and safety guidelines for the product.

1.1 Part Number Definition

PD-65xxG/AC/M/F: AC input family.

Table 1-1. Part Number Definition

Symbol	Description
xx	Represents number of ports (12 or 24).
AC	Midspan has AC input.
M	Midspan includes PowerView Pro.
F	Midspan enables full power on all ports.
G	Represents the bandwidth (10/100/1000 Mbps).

Table 1-2. Model Selection

Part Number	Number of Ports	Data Rate [Mbit per Sec]	Managed	Power Scheme
PD-6512G/AC/M	12	10/100/1000	Yes	Full Power
PD-6524G/AC/M/F	24	10/100/1000	Yes	Full Power

1.2 Electrical Compatibility Approvals

Microchip's PD-65xxG/AC Midspans series complies with the following standards:

- FCC Part 15: Class B with FTP cabling and Class A with UTP cabling
- EN 55032 (CISPR 32): Class B with FTP cabling and Class A with UTP cabling
- EN 55024 (CISPR 24)
- Canadian ICES-003, Class B

1.3 Safety Standard Approvals

Microchip meets the following safety standards. Consult Microchip for a complete list of safety certifications.

- UL/IEC/EN 62368-1

1.4 CE Marking

CE marking on this product indicates that the product complies with the Electromagnetic Compatibility (EMC) Directive and Low Voltage Directive (LVD).

1.5 Safety Information

Read the safety information before using the PoE Midspan unit.

1.5.1 General Guidelines

Read the following safety information before carrying out any installation, removal, or maintenance procedure on the PoE Midspan. Warnings contain directions to be followed for the safety of personal and product.

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1.5.2 Warnings

- Read installation instructions in 4. PoE Midspan Installation before connecting Midspan to its power source.
- Read instructions in 4. PoE Midspan Installation before connecting Midspan-to-Midspan power backup.
- Only trained and qualified personnel must be allowed to install, replace, and service this equipment.
- Midspan must be connected using a grounded power cord, as defined in 1.5.3 Power Cord.
- This ITE device must be connected to PoE (power supply over Ethernet) networks only, without routing to other networks.
- The power cord must not be attached to the surface of the building or pass-through walls, ceilings, floors, and similar openings in the building structure.
- Steps must be taken to prevent physical damage to the power cord, including proper routing.
- This product relies on building installation for short-circuit (over-current) protection. Use only a fuse or circuit breaker not higher than 15A for 120 VAC (U.S.) or 10A for 230 VAC (international).
- All wiring and connections must conform to NFPA 70 (NEC).
- Do not work on the system or connect/disconnect cables during lightning storms.
- A voltage mismatch can damage the equipment and can pose a fire hazard. If voltage indicated on the label is different from the power outlet voltage, do not connect Midspan to this outlet.
- For shelf-mounted equipment, verify that surface is stable and strong enough to support the equipment. Do not stack more than **four** Midspan units.
- When disposing this product, follow all local laws and regulations.
- **Data** and **Data and Power** ports of the Midspan are shielded RJ-45 data sockets. They cannot be used as Plain Old Telephone Service (POTS) sockets. Only connect RJ-45 data connectors to these sockets.
- Associated Ethernet wiring must be limited to the inside of the building.

1.5.3 Power Cord

Replacement of power cord must meet the local requirements.

- To ensure a reliable connection to an AC mains supply, equipment provides an appliance IEC60320 inlet used for connecting a detachable power supply cord.
- Power socket outlet must be located near Midspan and easily accessible. The only way of removing power from unit is by disconnecting the power cord from the outlet.
- This unit operates under Safety Extra Low Voltage (SELV) conditions, according to IEC/EN60950-1 or ES1 according to IEC/EN 62368-1.
  Note: Conditions are maintained only if the equipment to which the unit is connected also operates under SELV/ES1 conditions.

1.5.4 Country-wise Power Cord Specifications

U.S.A. and Canada

- Cord must be UL-approved or CSA certified.
- Minimum specification for flexible cord is:
  - No. 18 AWG
  - Type SV or SJ
  - Three-conductor power cable
- Cord set must have a rated current capacity of at least 10A.
- The attachment plug must be an earth-grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

Denmark Supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.

Switzerland Supply plug must comply with SEV/ASE 1011.

France and Peru IT supplies cannot power this unit. If your supplies are an IT type, unit must be powered by 230V (2P+T) through an isolation transformer with a 1:1 ratio, and with secondary connection point labeled Neutral and connected directly to the ground.

U. K PoE Midspan is covered by General Approval NS/G/12345/J/100003, for indirect connection to a public telecommunications system.

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2. Information en Matière de Sécurité

Lire les informations suivantes en matière de sécurité avant d'utiliser d'activer l'alimentation sur votre appareil Ethernet Midspan.

2.1 Directives Générales

Lire les informations suivantes en matière de sécurité avant d'installer ou enlever quoi que ce soit, ou procéder à l'entretien de l'alimentation de votre appareil Ethernet Midspan. Les mises en garde contiennent des instructions qui doivent être suivies pour la sécurité des personnes et du produit. Suivre les instructions soigneusement.

2.2 Mises en Garde

- Lire les instructions d'installation dans la cette 4. PoE Midspan Installation avant de connecter le Midspan à une source d'alimentation.
- Lire les instructions d'installation dans la cette 4. PoE Midspan Installation avant de connecter le Midspan à une source de sauvegarde Midspan.
- Seul du personnel formé et qualifié doit être autorisé à installer, remplacer et entretenir cet équipement.
- Le Midspan doit être connecté au moyen d'une corde d'alimentation avec prise de terre, comme précisé à la 1.5.3 Power Cord.
- Cet ITE appareil doit être branché à des réseaux PoE (alimentation électrique par Ethernet) seulement, et ce, sans routage vers d'autres réseaux.
- Le cordon d'alimentation ne doit pas être fixé à la surface du bâtiment ni traverser les murs, les plafonds, les planchers et les ouvertures similaires de la structure du bâtiment.
- Des mesures doivent être prises pour éviter tout dommage physique au cordon d'alimentation, y compris un acheminement approprié.
- Ce produit dépend de l'installation électrique de l'immeuble pour une protection contre les courts-circuits (surcharges de courant). Utiliser seulement un fusible ou un disjoncteur dont la puissance ne dépasse pas 15A pour 120VAC (É.-U.), ou 10A pour 230VAC (international).
- Tout le câblage et les connexions doivent être conformes à la norme NFPA 70 (NEC).
- Ne pas exécuter de travaux sur le système, connecter ou déconnecter des câbles pendant les orages.
- Une disparité de voltage peut endommager l'équipement et constituer un risque d'incendie. Si le voltage indiqué sur l'étiquette est différent du voltage de la source d'alimentation, ne pas connecter le Midspan à cette prise.
- Pour un équipement monté sur une tablette, vérifier que la surface est stable et suffisamment solide pour le supporter. Ne jamais empiler plus de **quatre** unités Midspan.
- Pour disposer/jeter ce produit, suivre les lois et règlements locaux.
- Les ports **Data** et **Data et Power** du PoE Midspan sont des prises de données blindées RJ45. Elles ne peuvent pas être utilisées comme prises de service téléphonique traditionnel. Connecter seulement des connecteurs de données RJ45 à ces prises. Le câblage Ethernet connexe doit être limité à l'intérieur de l'immeuble.
- Le câblage Ethernet associé doit être limité à l'intérieur du bâtiment.

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3. 10/100/1000Base-TX Ports Definition

The following sections detail PD-65xxG ports, and their functions.

3.1 Data Input Ports

Midspan has 12 or 24 10/100/1000Base-T **Data In** ports, which are located on PoE front panel, configured in a non-crossover manner (straight-wired), as shown in Figure 3-1.

These ports are designed to carry Ethernet data (Tx/Rx) over:

- Standard 4-wire pairs (pins 1/2, 3/6, 4/5, and 7/8) (1000Base-T)
- 2-wire pairs (pins 1/2 and 3/6) (10/100Base-T)

3.2 Data and Power Output Ports

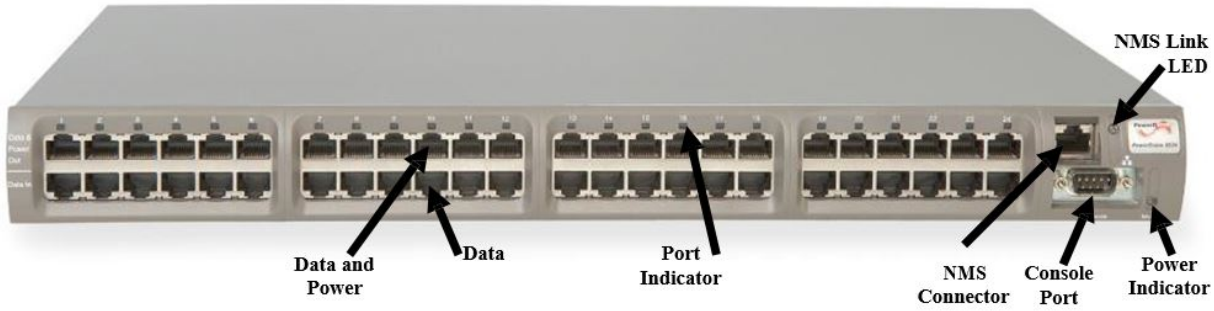
Midspan has 12 or 24 10/100/1000Base-T **Data and Power Out** ports, which are located on the front panel, configured in a non-crossover manner (straight-wired), as shown in the following figure.

These ports are designed to carry Ethernet data over:

- Standard 4-wire pairs (pins 1/2, 3/6, 4/5, and 7/8) (1000Base-T)
- 2-wire pairs (pins 1/2 and 3/6) (10/100Base-T)
- PD-65xxG series carry DC power over pin pairs (pins 4/5 and 7/8)

Note: The PoE Midspan is not a repeater. Therefore, the maximum distance from Ethernet switch must not exceed 100 meters (328 ft.). The PoE Midspan is guaranteed to work only within this distance, as specified in IEEE 802.3af standard.

Figure 3-1. Front-View (PD-6524G) of PoE Midspan



3.3 Indicators

A set of indicators displays the status of the PoE Midspan and its ports. For more information about the status information during operation, see Table 3-1 and Table 3-2.

3.3.1 Power Indicator LED

Power Indicator LED on the front panel displays power status of the PoE Midspan. When this LED is illuminated in green, it indicates that the Midspan is receiving AC power. For more information, see Table 3-1.

3.3.2 Port Indications

The following sections detail PD-65xxG port indicators.

3.3.2.1 PD-65xxG Midspan Series

The uni-color (green) indicator on each port displays port status:

- Green indicates that the terminal unit (PD) has been identified as **Power over Ethernet Enabled**. It is active and receiving power.
- Blinking green indicates that the port does not supply power and is inactive.

Note: The PDs that are not PoE-enabled devices are not powered by Midspan.

Table 3-1. Power Status Indications

Indicator	Color	Main Power Status	Remarks
Main	Off	Power supply (110/220 V_{AC}) is inactive.	Internal power supply unit is unplugged.
	Green	Power supply (110/220 V_{AC}) is active.	Internal power supply voltage is within limits.

Table 3-2. Port Status Indications

Port LED Color	Port Load Conditions	Port Voltage
Off	Inactive load or unplugged port.	Power to port is disconnected. No DC voltage is present on port output lines.
Green	Valid PD device was detected, and is being powered by the Midspan.	Continuous nominal DC voltage is present on RJ45 pins 4/5 and 7/8.
Green blinks once every second	Overload or short circuit – PD power consumption is too high.	Power to port is disconnected. No DC voltage is present on the port output lines.
Green blinks once every 0.5 seconds	Valid load. Total aggregated power exceeds pre-defined power budget.	Power is not connected to port. No DC voltage is present on the port output lines.

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3.4 Connectors

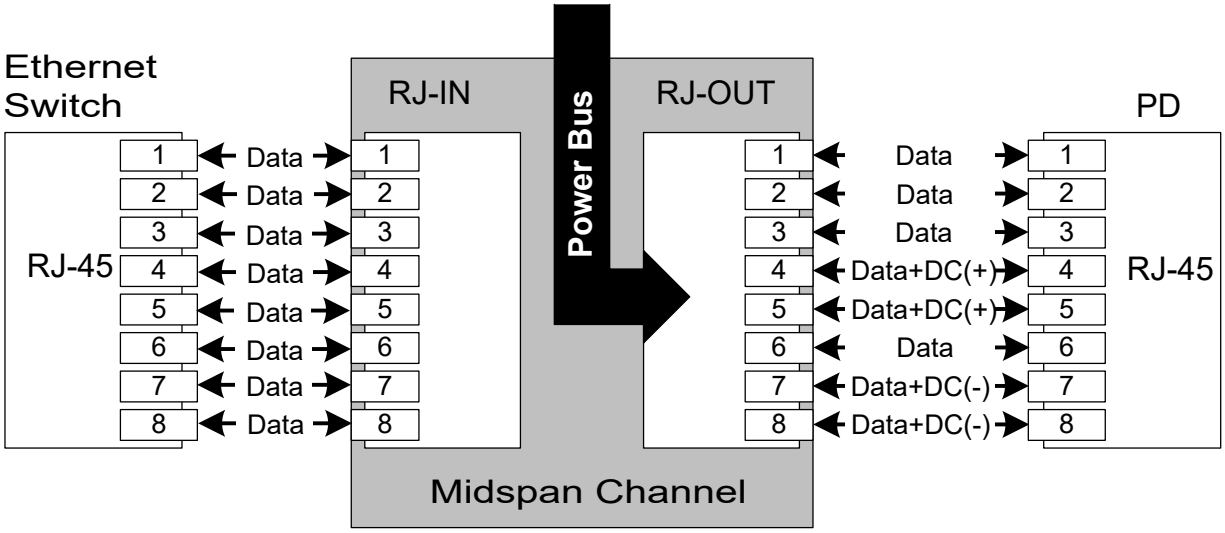
PD-65xxG Midspan devices have a DB-9 RS232 connector, which is used for initial IP address configuration, software maintenance, upload/download configuration, and other tasks.

Using cross null modem cable is recommended. Set your terminal application to 38,400-baud, 8 data bits, 1 stop bit, no parity, and flow-control OFF.

Pin 2 (RXD) ⇔Pin 3 (TXD)

Pin 5 (GND) ⇔Pin 5 (GND)

Figure 3-2. Connecting to Midspan



Each data port on the Midspan device is configured as data **Pass-Through** ports for all data pins (pins 1, 2, 3, 6, 4, 5, 7, and 8). Use cabling of Category 5 or higher.

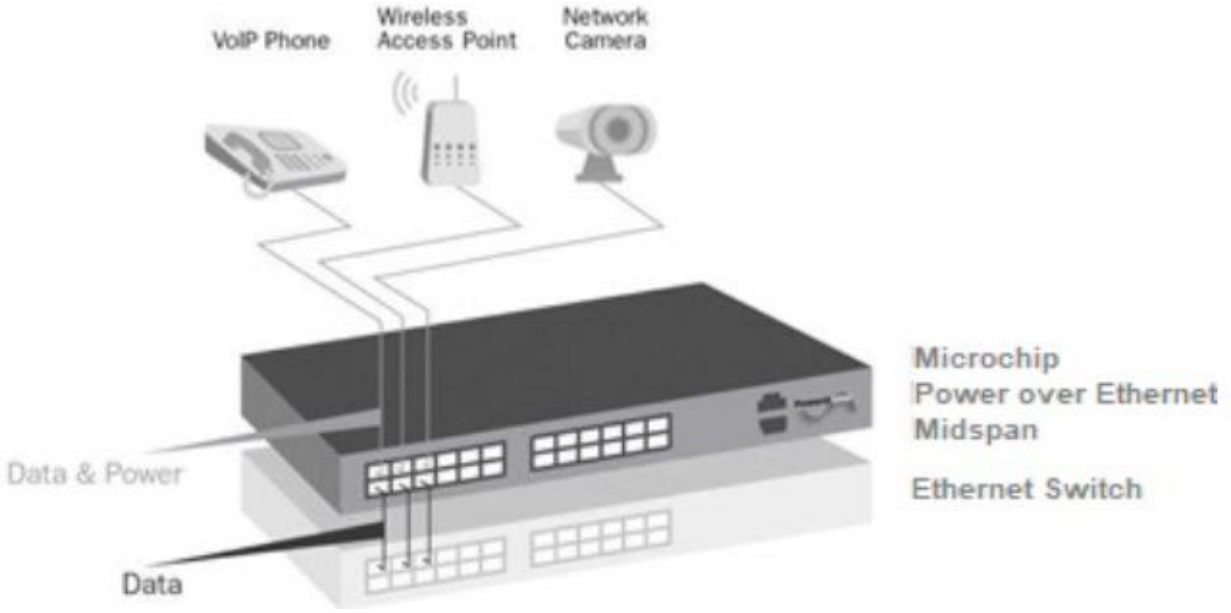
4. PoE Midspan Installation

The following sections describe how to install a PoE Midspan.

4.1 Background Information

As shown in the following figure, Midspan is connected in series to an Ethernet switch/hub. Switch's data output terminals are connected to Midspan. Midspan delivers power over the spare twisted pairs (pins 7/8, and 4/5) in PD-65xxG Midspan series of Category 5 cabling, without degrading the data quality. Most installations require Midspan to be rack-mounted.

Figure 4-1. Typical Installation



4.2 Verifying Kit Contents

Unpack the kit and verify that the following items are included:

- PoE Midspan
- Mounting brackets (for 19-inch racks) and a plastic cover
- Screws for assembling mounting brackets
- Self-adhesive rubber feet
- User guide (this file)
- Power Cord

Before proceeding, record the serial number of the unit in the following table for future reference. Serial number is found on the information label at the back of the PoE Midspan.

Serial Number	

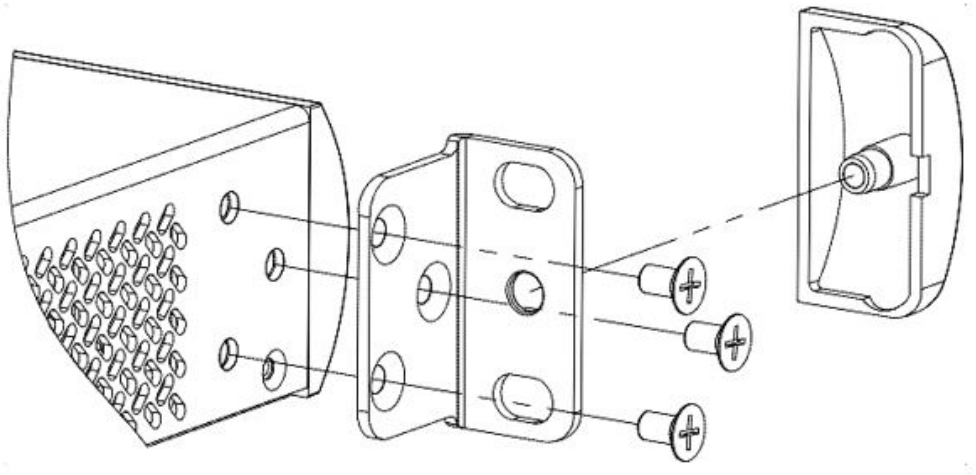
4.3 Rack Mounting Brackets

Midspan comes with 19-inch mounting brackets and screws. To install Midspan into a 19-inch rack:

1. Remove self-adhesive rubber feet from the bottom surface.
2. Install brackets using three screws per side.

Note: Rack-mounting screws are not provided with the kit.

Figure 4-2. Installing Mounting Brackets



4.4 Installation Factors

Follow the installation factors carefully:

- **Elevated Operating Ambient Temperature**: If installed in a closed or multi-unit rack assembly, operating ambient temperature in rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with manufacturer's maximum rated ambient temperature (Tmra).
- **Reduced Air Flow**: Install the equipment in a rack in a manner that does not compromise the amount of airflow required for safe operation of the equipment.
- **Mechanical Loading**: While mounting the equipment into a rack, ensure that mechanical loading is even.
- **Circuit Overloading**: Consider the connection of equipment to supply circuit and the effect overloading of circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings must be given while addressing this concern.
- **Reliable Grounding (Earthing)**: Maintain reliable earthing of the rack mounted equipment. Pay attention to supply connections, other than direct connections to branch circuit (for example, the use of power strips).

4.5 Connecting Ethernet Cables

The ports on the front panel of Midspan are configured as **Pass-Through** ports for eight (1, 2, 3, 6, 4, 5, 7, and 8) conductors of RJ45 connectors. Use Category 5 cabling while connecting.

1. Connect cables from Ethernet Switch to **Data In** ports (lower row on front panel).
2. Connect cables from the IEEE 802.3af ready terminals (PDs) to the corresponding **Data and Power Out** ports (upper row on front panel).

4.6 Connecting Power Cables

While using an AC source to power Midspan, plug-in the provided power cord to the AC connector.

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4.7 Powering Up the Unit

PoE Midspan does not have ON/OFF switch. To apply or remove power from Midspan, insert or remove power cable to receptacle (AC) on the back panel of the unit.

With power applied:

- Midspan powers up.
- Internal fan operates.
  - Device runs its Power-On Self-Test (POST), which takes less than 10 seconds. During POST, all ports are disabled and indicators illuminate in the following sequence:
  - Port indicators and main indicators illuminate in green.
  - Power indicator remains lit in green while port indicators are OFF.

Ports are now ready (enabled) for normal operation.

If LEDs are not lit, see 5. Troubleshooting section for instructions.

5. Troubleshooting

The following sections describe the troubleshooting procedures to address any problems with a unit.

5.1 Preliminary Steps

If you have a problem with the unit, verify:

- The power is applied to Midspan.
- A crossover-type Ethernet cable is not used.
- Ethernet cable from network is connected to **Data** port.
- Ethernet cable to PD is connected to **Data and Power** port.
- Cable pairs are attached to their corresponding ports.

5.2 Troubleshooting Steps

The following table provides a problem and resolution sequence to assist in troubleshooting minor operating problems. If the following steps do not solve your problem, contact the dealer for further assistance.

Table 5-1. Troubleshooting Steps

Symptom	Corrective Steps
Midspan does not power up.	1. Ensure that the power cord is properly connected and functioning. 2. Verify voltage at power inlet is between 100 V_{AC} and 240 V_{AC}. 3. Remove and reapply power to device and check indicators during power-up sequence.
A port indicator is not lit and corresponding PD does not operate.	1. Verify port is enabled (Midspan did not detect a PD). 2. Verify that the PD is designed for PoE operation. 3. Verify that you are using a standard Category 5/5e/6, straight-wired cable, with four pairs. 4. If an external power splitter is in use, replace it with a viable splitter. 5. Verify PD is connected to **Data and Power Output** port. 6. Try to reconnect the same PD to a different port on the same Midspan or on another one. If it works, there is probably a faulty output port or RJ45 connection. 7. Verify port shutdown command was not issued through web management.
End device operates, but there is no data link.	1. Verify port indicator on front panel is continuously lit. 2. If an external power splitter is in use, replace it with a viable splitter. 3. Verify that for this link you are using a standard UTP/FTP Category 5 straight (non-crossover) cabling, with all four pairs, and that link is 100 meters long or less. 4. Try to reconnect the same PD to a different port on the same Midspan or on another one. If it works, there is probably a faulty port or faulty RJ45 connection.
Is it safe to keep the Midspan running while a port indicator is green and blinking?	This is a safe condition. The blinking green indication is due to: 1. A device not compliant to IEEE 802.3af is detected. 2. Terminals 4/5 and 7/8 are shorted together. 3. Forced external power supplied into the port. Midspan total power consumption was reached. 4. During these conditions, port power is disconnected.

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6. Specifications

The following sections detail unit specifications.

6.1 Physical Specifications

Table 6-1. Dimensions

Parameter	Dimensions	
	mm	inch
Height	44	1.75
Width	438	17.3
Depth	272	10.8

Table 6-2. Weight Specifications

Part Number	Weight
PD-6512G/AC/M	4.7 Kg (10.4 lb)
PD-6524G/AC/M/F	5.0 Kg (11.0 lb)

6.2 Environmental Specifications

Table 6-3. Environmental Specifications

Parameter	Value
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	90% max. (non-condensing)

6.3 Electrical Specifications

Table 6-4. Electrical Specifications

Parameter		Value
AC Input Voltage		100 V_{AC} to 240 V_{AC} at 50/60 Hz
Input Current at 100 V_{AC}	PD-6512G/AC/M	4 A
	PD-6524G/AC/M/F	5.5 A
Nominal Output Voltage		44 V_{DC} to 57 V_{DC}
Total Output Power		400 W max. (PD-6512G/AC/M)
		400 W max. (PD-6524G/AC/M/F)
Maximum Output Power per Port		16.8 W (do not exceed Total Output Power)

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7. Power Management

Power Management is the prioritization of PDs, whereby certain devices receive electrical power whenever the overall power consumption exceeds the power supply. Power Management kicks in when a Midspan network's overall power consumption exceeds the Midspan maximum power. In the Midspan GUI, a PoE PD which is not powered is symbolized by blinking green LED switching once every 0.5 seconds.

- Midspan Network Management Module may reduce total power to lower values by SNMP or when **Dynamic UPS Power Management** is enabled and the Midspan UPS operates on battery power.

Refer to the *PowerView Pro User Guide* for more information.

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8. Contacting Technical Support

If you encounter any problems while installing or using this product, consult Microchip technical support team through the website or contact on the following number:

USA/Canada

Telephone: +1 877 480 2323

Internet: www.microchip.com/support

9. Revision History

Revision	Date	Description
A	06/2021	Initial Revision

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Customer Support

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Embedded Solutions Engineer (ESE)
- Technical Support

Customers should contact their distributor, representative or ESE for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in this document.

Technical support is available through the website at: www.microchip.com/support

Microchip Devices Code Protection Feature

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods being used in attempts to breach the code protection features of the Microchip devices. We believe that these methods require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Attempts to breach these code protection features, most likely, cannot be accomplished without violating Microchip's intellectual property rights.
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