

# PoE & PoE+ Giga-MiniMc with LFPT

*USER MANUAL*



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Powered by

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**POE GIGA-MINIMC LFPT**

**NOTE:** *Unless otherwise noted in this manual, any reference is applicable for both the 1x9 and SFP versions of the PoE Giga-McBasic LFPT.*

The PoE Giga-MiniMc is a solution for private network applications that require Power-over-Ethernet (PoE) (IEEE802.3af) for locations inside buildings where PoE is needed to power an Ethernet device. The standalone unit offers a model with one SFP or fixed fiber transceiver, 1x9, uplink for the network connection, one PSE 10/100/1000Base-T copper port that provides PoE and one 10/100/1000Mbps copper port. As a fiber-fed demarcation unit, it provides both power and data to a remote device over a standard CAT5 copper line, eliminating the need for a power connection to the remote device. The PoE Giga-MiniMc provisions up to 15.4 Watts on one copper port, and can be powered by an external AC adapter or DC terminal block. For more robust power requirements on both copper ports, please refer to the information about the *PoE+ Giga-MiniMc*.

The SFP uplink can support fiber or copper SFPs. The fiber SFP, available in SC or LC connectors, supports 100FDX or 1000FDX; a copper SFP supports the SGMII interface (10/100/1000Mbps). The SFP, with or without DDMI, is available for purchase from B+B SmartWorx. The SFP must be MSA-compliant.

The copper ports auto negotiate to the connected device's speed and duplex mode: 10 Mbps, 100 Mbps or 1000 Mbps, and HDX or FDX (including Flow Control). The PoE Giga-MiniMc supports jumbo frames up to 10240.

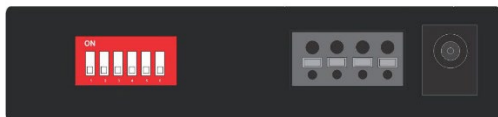
**NOTE:** *Some options require items that are sold separately, available from B+B SmartWorx.*

## INSTALLATION

PoE Giga-MiniMc installs virtually anywhere: as a standalone, table-top device, on a DIN rail, or using a Wallmount bracket. As a standalone device, the end user can install PoE Giga-MiniMc in locations with extremely limited space. Velcro strips are also included to attach the device to most surfaces. DIN Rail clips and Wallmount bracket are optional, available from B+B SmartWorx.

Several models of the PoE Giga-MiniMc support single-strand fiber for operation. Since single-strand fiber products use optics that transmit and receive on two different wavelengths, single-strand fiber products must be deployed in pairs. The two connected products must also have the same speed and distance.

## DIP SWITCH CONFIGURATION – SFP & 1X9



*PoE Giga-MiniMc SFP*

DIP Switch	Name	Description	Default Setting
1	PoE Reset	ON forces Port 2, PSE/PoE, to OFF on LOS of Fiber Input.	OFF
2	Factory Set	Do not change.	OFF
3	LoSPD	ON sets SFP for low-speed operation.	OFF
4	Factory Set	Do not change	OFF
5	Factory Set	Do not change.	OFF
6	Factory Set	Do not change.	OFF

## LOSPD DIP SWITCH

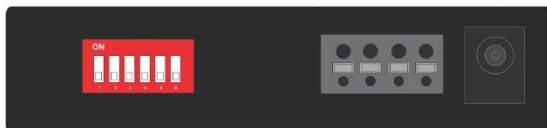
The DIP Switch for LoSPd (Low Speed) is to allow the end user to set a speed for a fiber SFP under the following conditions:

- Setting the LoSPD DSW to ON will force the SFP to operate at 100Mbps. When set in the default of OFF, the SFP will run at its maximum rate of the SFP installed.
- If a dual-speed fiber SFP 100/1000Mbps is installed, setting the LoSPd to ON will force the SFP to operate at 100Mbps.

**NOTE:** Under no conditions will the LoSPd DSW impact any copper SFPs. Some 1000Mbps SFPs may not function properly when forced to 100Mbps.

## POE RESET DIP SWITCH

When set to ON, it will force the PSE output power on the copper port OFF when the LINK state is lost on the SFP line (copper or fiber SFP). By default, the DSW is set to OFF.



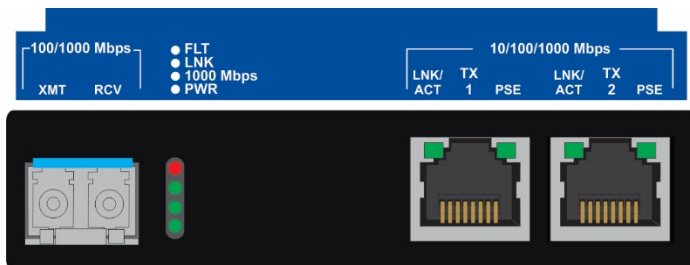
PoE Giga-MiniMc 1x9

DIP Switch	Name	Description	Default Setting
1	PoE Reset	ON forces Port 2, PSE/PoE, to OFF on LOS of Fiber Input.	OFF
2	Factory Set	Do not change.	OFF
3	LoSPD	ON sets SFP for low-speed operation.	OFF
4	Factory Set	Do not change.	OFF
5	Factory Set	Do not change.	OFF
6	Factory Set	Do not change.	OFF

When set to ON, it will force the PSE output power on the copper port OFF when the LINK state is lost on the fiber segment. By default, the DSW is set to OFF.

## LED OPERATION SFP & 1X9

The PoE Giga-MiniMc includes LEDs for three ports, as shown below:



PoE Giga-MiniMc SFP

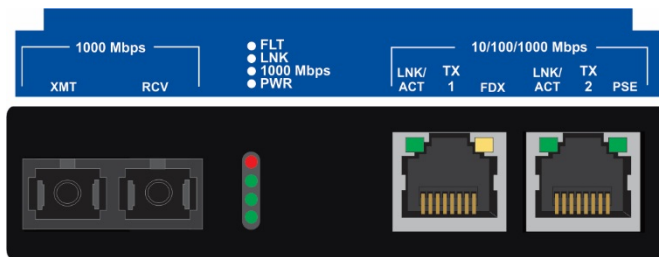
### SFP LED Functions

<b>FLT</b>	Glows red when a fault has been detected on the unit.
<b>LNK</b>	Glows green with a valid link.
<b>1000 Mbps</b>	Glows green when SFP is running at 1000 Mbps.
<b>PWR</b>	Glows green when unit is powered.

### RJ-45 LED Functions

<b>LNK/ACT (TX1, TX2)</b>	Glows green with a valid link. Blinks green when activity is detected.
<b>PSE (TX2)</b>	Glows green when port is supplying PoE power. Blinks green during training and fault conditions: a series of two flashes indicates an overcurrent fault; a series of five flashes indicates invalid low or high discovery signature resistance. Off if the port is not supplying power.
<b>FDX (TX1)</b>	Glows amber when port is running full-duplex.





PoE Giga-MiniMc 1x9

1x9 LED Functions	
<b>FLT</b>	Glow red when a fault has been detected on the unit.
<b>LNK</b>	Glow green with a valid link.
<b>1000 Mbps</b>	Glow green when is running at 1000Mbps.
<b>PWR</b>	Glow green when unit is powered.

RJ-45 LED Functions	
<b>LNK/ACT (TX1, TX2)</b>	Glow green with a valid link. Blink green when activity is detected.
<b>PSE (TX1, TX2)</b>	Glow green when port is supplying PoE power. Blink green during training and fault conditions: a series of two flashes indicates an overcurrent fault; a series of five flashes indicates invalid low or high discovery signature resistance. Off if the port is not supplying power.
<b>FDX (TX1)</b>	Glow amber when port is running full-duplex.

**NOTE:** The fixed twisted-pair port labeled PSE is the only port capable of providing Power-over-Ethernet.

## POWERING OPTION

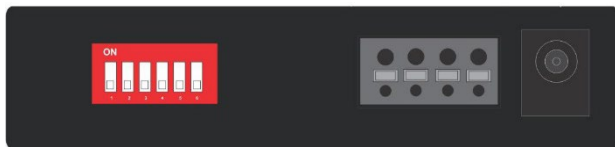
As a standalone unit, the PoE Giga-MiniMc uses a universal external desktop switching power adapter. The PoE Giga-MiniMc also includes a DC terminal block to support a voltage range of 45 to 57 VDC

PoE Giga-MiniMc supports two powering options:

- Desktop AC power adapter with country specific power cord (included).
- 4-terminal DC power block.

## DC TERMINAL BLOCK WIRING INSTRUCTIONS

The PoE Giga-MiniMc can be powered via the DC terminal block. From a power source, connect to any one positive and any one negative terminal on PoE Giga-MiniMc.



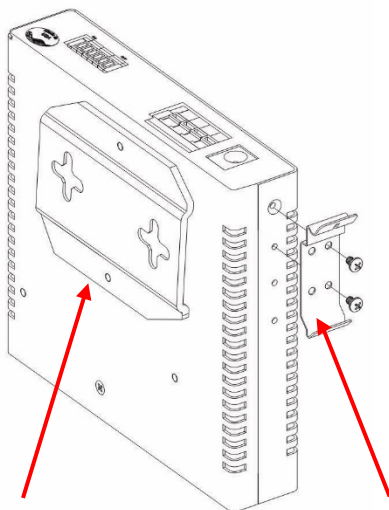
*PoE Giga-MiniMc*

**NOTE:** When using stranded wire, the leads must be tinned, and equivalent to a 16 AWG solid conductor. The PoE Giga-MiniMc is protected against mis-wiring; if mis-wired the PoE Giga-MiniMc will not function. The PoE Giga-MiniMc cannot support -48 VDC.

## DIN RAIL AND WALLMOUNT BRACKET

The PoE Giga-MiniMc can be mounted with DIN Rail clips, (hardware option available from B+B SmartWorx). The DIN Rail clips include screws to allow the installation onto a DIN Rail. Install the screws into DIN Rail clips, which should be mounted perpendicular to the DIN Rail. Snap the converter onto the clips. To remove the converter from the DIN Rail, use a flat-head screwdriver inserted into the slot to gently pry the converter from the rail. In addition, a Wallmount bracket can be installed onto the PoE Giga-MiniMc.

**NOTE:** DIN clips are designed for use on DIN-35 rail.



### Wallmount Bracket - DIN Rail Mounting

**NOTE:** DIN clips are designed for use on a DIN-35 rail. When using the side-installed location, remove the countersunk screw from the enclosure, and then use the vacated hole for one of the DIN clip screws.

## DC POWER SUPPLY PRECAUTIONS

The following precautions should be observed when installing chassis with DC power supplies:

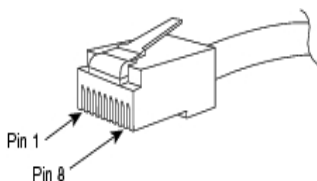
1. Check nameplate ratings to assure there is no overloading of supply circuits that could have an effect on overcurrent protection and supply wiring.
2. When installing 45 to 57 VDC rated equipment, it must be installed only per the following conditions:
  - a. Connect the equipment to a 45 to 57 VDC supply source that is electrically isolated from the alternating current source. The 45 to 57 VDC source must be connected to a 45 to 57 VDC SELV source.
  - b. The maximum terminal voltage is 57 VDC.
  - c. Input wiring to terminal block must be routed and secured in such a manner that it is protected from damage and stress. Do not route wiring past sharp edges or moving parts.
  - d. A readily accessible disconnect device, with a 3mm minimum contact gap, shall be incorporated in the fixed wiring.
3. Grounding: reliable grounding of this equipment must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than direct connections to the branch circuit. The Negative Terminal is common to the grounded case.
4. -48 VDC cannot be supported.

TROUBLESHOOTING

- PWR LED glows green when the unit is powered. If this LED is not lit, contact Advantech B+B SmartWorx Technical Support.
- If the PSE LED flashes twice, it may indicate an over-current condition. The PSE LED should maintain solid green, to indicate consistent power. Check the PD device and its requirements.

RJ-48 PINOUTS

The following table lists the pin configuration for the RJ-48 connector.



Pin#	Signal Name 1000M	Signal Direction 10/100M	PoE / PoE+ (ALT-B)
1	TXD1+	Out*	
2	TXD1-	Out*	
3	RXD2+	IN*	
4	D3+		+V
5	D3-		+V
6	RXD2-	In*	
7	D4+		-V
8	D4-		-V

## SPECIFICATIONS - POE GIGA-MINIMC LPFT

### Ethernet Connections

- 10/100/1000 BaseT
- Auto Negotiation
- Auto Cross
- Flow Control
- 10240 MTU
- Full Line-Rate Forwarding

### DC Input Voltage

- 45 to 57 VDC on DC terminal block
- 48 VDC on DC jack

### AC Desktop Adapter

- Input: 100 to 240  $\pm$ 10% VAC, 50/60H, 0.7A \*
- Output: 48 VDC, 0.62A

\* Maximum input power in Watts calculated by multiplying input Amps by lowest input voltage.

### Power Consumption

- 21W, maximum (PSE + PD)
- 5W, maximum (PSE)

### Operating Temperature

- 0 to +70 °C (+32 to +158 °F) DC terminal block
- 0 to +50 °C (+32 to +122 °F) with Advantech B+B SmartWorx supplied AC desktop adapter.

**Storage Temperature:** -40 to +85 °C (-40 to +185 °F)

**Humidity:** 5 to 95% (non-condensing); 0 to 10000 ft. altitude

### Power Characteristics

- Consumes <10 Watts (heating) plus PSE power
- IEEE802.3af Power to Field <15.4 Watts
- Powered from external 48 VDC power jack
- Powered from external 45 to 57 VDC 4-position terminal block
- Input power terminals are isolated from unit chassis
- Threaded chassis grounding holes on unit for ground lug mounting

### Standards Compliance

- IEEE 802.3af Power Over Ethernet
- IEEE 802.3 Ethernet Standards
- IEEE 802.3u Auto Negotiation
- RFC-2474
- RFC-2475 DiffServ QoS

## POE+ GIGA-MINIMC LFPT

The PoE+ Giga-MiniMc LFPT is a solution for private network applications that require Power-over-Ethernet (PoE) (IEEE802.3af) for locations inside buildings where PoE is needed to power an Ethernet device. The standalone unit offers a model with one SFP or fixed fiber transceiver, 1x9, uplink for the network connection, and two PSE 10/100/1000Base-T copper ports that provide PoE. As a fiber-fed demarcation unit, it provides both power and data to a remote device over a standard CAT5 copper line, eliminating the need for a power connection to the remote device. The PoE+ Giga-MiniMc provides up to 25.4 Watts per copper port and is powered by an external AC adapter or DC terminal block.

The SFP uplink can support fiber or copper SFPs. The fiber SFP, available in SC or LC connectors, supports 100FDX or 1000FDX; a copper SFP supports the SGMII interface (10/100/1000Mbps). The SFP, with or without DDML, is available for purchase from B+B SmartWorx. The SFP must be MSA-compliant.

The copper ports auto negotiate to the connected device's speed and duplex mode: 10 Mbps, 100 Mbps or 1000 Mbps, and HDX or FDX (including Flow Control). The PoE+ Giga-MiniMc supports jumbo frames up to 10240.

**NOTE:** *Unless otherwise noted in this manual, any reference is applicable for both 1x9 and SFP versions of the PoE+ Giga-MiniMc.*

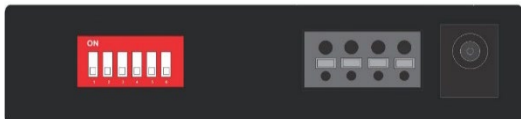
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## INSTALLATION

PoE+ Giga-MiniMc installs virtually anywhere: standalone, table-top device, on a DIN rail or using a Wallmount bracket. As a standalone device, the end user can install PoE+ Giga-MiniMc in locations with extremely limited space. Velcro strips are also included to attach the device to most surfaces. DIN rail clips and Wallmount bracket are optional, available for purchase from B+B SmartWorx.

Several models of the PoE+ Giga-MiniMc support single-strand fiber for operation. Since single-strand fiber products use optics that transmit and receive on two different wavelengths, single-strand fiber products must be deployed in pairs. The two connected products must also have the same speed and distance capabilities.

## DIP SWITCH CONFIGURATION - SFP &amp; 1X9



PoE+ Giga-MiniMc SFP

DIP Switch	Name	Definition	Default Setting
1	PoE Reset 2	ON forces Port 2 PoE OFF on LOS of Fiber Input.	OFF
2	PoE Reset 1	ON forces Port 1 PoE OFF on LOS of Fiber input.	OFF
3	LoSpd	ON sets SFP for low speed operation.	OFF
4	Factory Set	Do not change.	OFF
5	Factory Set	Do not change.	OFF
6	Factory Set	Do not change.	OFF

## LOSPD DIP SWITCH

The DIP Switch for LoSPd (Low Speed) is to allow the end user to set a speed for a fiber SFP under the following conditions:

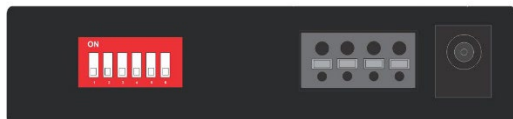
- Setting the LoSPd DSW to ON will force the SFP to operate at 100Mbps. When set in the default of OFF, the SFP will run at its maximum rate of the SFP installed.
- If a dual-speed fiber SFP 100/1000Mbps is installed, setting the LoSpd to ON will force the SFP to operate at 100Mbps.

**NOTE:** Under no conditions will the LoSPd DSW impact any copper SFPs. Some 1000Mbps SFPs may not function properly when forced to 100Mbps.

## POE RESET 1 &amp; POE RESET 2 DIP SWITCH

When set to ON, it will force the PSE output power on the copper port OFF when the LINK state is lost on the fiber segment. By default, the DSW is set to OFF.





PoE+ Giga-MiniMc 1x9

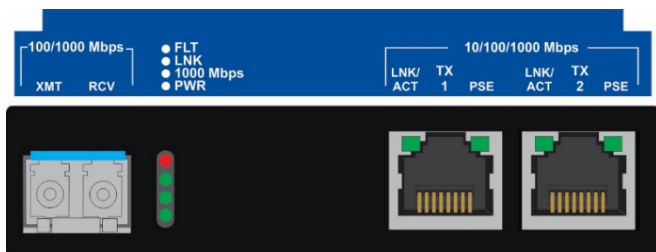
DIP Switch	Name	Description	Default Setting
1	PoE Reset 2	ON forces Port 2 PoE OFF on LOS of Fiber Input.	OFF
2	PoE Reset 1	ON forces Port 1 PoE OFF on LOS of Fiber Input.	OFF
3	Factory Set	Do not change.	OFF
4	Factory Set	Do not change.	OFF
5	Factory Set	Do not change.	OFF
6	Factory Set	Do not change.	OFF

#### POE RESET 1 & POE RESET 2 DIP SWITCH

When set to ON, it will force the PSE output power on the copper port OFF when the LINK state is lost on the fiber segment. By default, the DSW is set to OFF.

LED OPERATION SFP AND 1X9

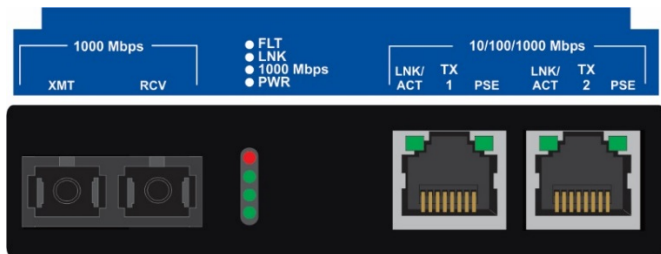
The PoE+ Giga-MiniMc includes LEDs for three ports, as shown below:



PoE+ Giga-MiniMc SFP

SFP LED Functions	
<b>FLT</b>	Glows red when a fault has been detected on the unit.
<b>LNK</b>	Glows green with a valid link.
<b>1000 Mbps</b>	Glows green when SFP is running at 1000Mbps.
<b>PWR</b>	Glows green when unit is powered.

RJ-45 LED Functions	
<b>LNK/ACT (TX1, TX2)</b>	Glows green with a valid link. Blinks green when activity is detected.
<b>PSE (TX1, TX2)</b>	Glows green when port is supplying PoE power. Blinks green during training and fault conditions: a series of two flashes indicates an overcurrent fault; a series of five flashes indicates invalid low or high discovery signature resistance. Off if the port is not supplying power.



PoE+ Giga-MiniMc 1x9

1x9 LED Functions	
<b>FLT</b>	Glows red when a fault has been detected on the unit.
<b>LNK</b>	Glows green with a valid link.
<b>1000 Mbps</b>	Glows green to indicate is running at 1000Mbps.
<b>PWR</b>	Glows green when unit is powered.

RJ-45 LED Functions	
<b>LNK/ACT (TX1, TX2)</b>	Glows green with a valid link. Blinks green when activity is detected.
<b>PSE (TX1, TX2)</b>	Glows green when port is supplying PoE power. Blinks green during training and fault conditions: a series of two flashes indicates an overcurrent fault; a series of five flashes indicates invalid low or high discovery signature resistance. Off if the port is not supplying power.

## POWERING OPTIONS

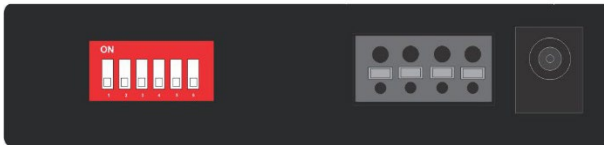
As a standalone unit, the PoE+ Giga-MiniMc uses a universal external desktop switching power adapter. The PoE+ Giga-MiniMc also includes a DC terminal block to support a voltage range of 51 to 57 VDC.

PoE+ Giga-MiniMc supports two powering options:

- Desktop AC power adapter with country specific power cord (included).
- 4-terminal DC power block.

## DC TERMINAL BLOCK WIRING INSTRUCTIONS

The PoE+ Giga-MiniMc can be powered via the DC terminal block. From a power source, connect to any one positive and any one negative terminal on PoE+ Giga-MiniMc.

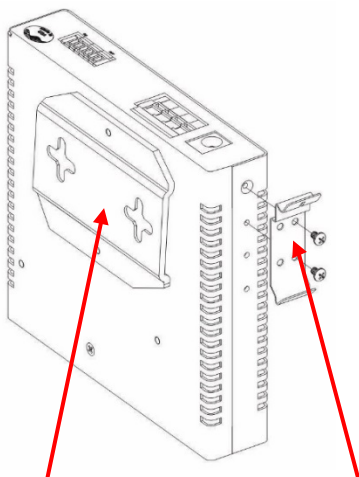


*PoE+ Giga-MiniMc*

**NOTE:** When using stranded wire, the leads must be tinned, and equivalent to a 16 AWG solid conductor. The PoE+ Giga-MiniMc is protected against mis-wiring; if mis-wired the PoE+ Giga-MiniMc will not function. The PoE+ Giga-MiniMc cannot support -48 VDC.

## DIN RAIL AND WALLMOUNT BRACKET

The PoE+ Giga-MiniMc can be mounted with two DIN Rail clips (hardware option available from B+B SmartWorx). The DIN Rail clips include screws to allow the installation onto a DIN Rail. Install the screws into DIN Rail clips, which should be mounted perpendicular to the DIN Rail. Snap the converter onto the clips. To remove the converter from the DIN Rail, use a flat-head screwdriver inserted into the slot to gently pry the converter from the rail. In addition, a Wallmount bracket can be installed onto the PoE+ Giga-MiniMc (optional purchase from B+B SmartWorx).

*Wallmount Bracket**DIN Rail Mount Bracket*

**NOTE:** DIN clips are designed for use on DIN-35 rail.

## DC POWER SUPPLY PRECAUTIONS

The following precautions should be observed when installing chassis with DC power supplies.

1. Check nameplate ratings to assure there is no overloading of supply circuits that could have an effect on overcurrent protection and supply wiring.
2. When installing 51 to 57 VDC rated equipment, it must be installed only per the following conditions:
  - a. Connect the equipment to a 51 to 57 VDC supply source that is electrically isolated from the alternating current source. The 51 to 57 VDC source must be connected to a 51 to 57 VDC SELV source.
  - b. The maximum terminal voltage is 57 VDC.
  - c. Input wiring to terminal block must be routed and secured in such a manner that it is protected from damage and stress. Do not route wiring past sharp edges or moving parts.
  - d. A readily accessible disconnect device, with a 3mm minimum contact gap, shall be incorporated in the fixed wiring.
3. Grounding: reliable grounding of this equipment must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than direct connections to the branch circuit. The Negative Terminal is common to the grounded case.
4. -48 VDC cannot be supported.

**TROUBLESHOOTING**

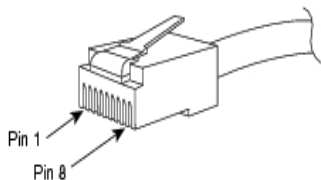
If the PoE+ Giga-MiniMc is not responding to the power provided to it, the following conditions may be responsible:

- There may be an overcurrent condition; this is indicated on the PSE LED by a series of two flashes.
- There may be an invalid low or high discovery signature resistance; this is indicated on the PSE LED by a series of five flashes.

If the PoE injector has power that can be verified, but the PSE LED is off, then contact Advantech B+B SmartWorx Technical Support.

**RJ-48 PINOUTS**

The following table lists the pin configuration for the RJ-48 connector.



Pin#	Signal Name 1000M	Signal Direction 10/100M	PoE / PoE+ (ALT-B)
1	TXD1+	Out*	
2	TXD1-	Out*	
3	RXD2+	In*	
4	D3+		+V
5	D3-		+V
6	RXD2-	In*	
7	D4+		-V
8	D4-		-V

## SPECIFICATIONS - POE+ GIGA-MINIMC LFPT

### Ethernet Connections

- 10/100/1000 BaseT
- Auto Negotiation
- Auto Cross
- Flow Control
- 10240 MTU
- Full Line-Rate Forwarding

### DC Input Voltage

- 51 to 57 VDC, DC terminal block
- 51 to 57 VDC, DC jack

### AC Desktop Adapter

- Input: 100 to 240  $\pm$ 10% VAC, 50/60H, 2A \*
- Output: 52 VDC, 2.31A

\* Maximum input power in Watts is calculated by multiplying input Amps by lowest input voltage..

### Power Consumption

- 65W maximum (PSE + PD)
- 5W maximum (PSE)

### Operating Temperature

- 0 to +70 °C (+32 to +158 °F) DC terminal block
- 0 to +50 °C (+32 to +122 °F) with B+B SmartWorx supplied AC desktop adapter.

**Storage Temperature:** -40 to +85 °C (-40 to +185 °F)

**Humidity:** 5 to 95% (non-condensing); 0 to 10000 ft. altitude

### Power Characteristics

- Consumes <10 Watts (heating) plus PSE power
- IEEE802.3af/at Power to Field < 50 Watts (2 x 25.4 Watts)
- Powered from external 51 to 57 VDC power jack
- Powered from external 51 to 57 VDC 4-position terminal block
- Input power terminals are isolated from unit chassis
- Threaded chassis grounding holes on unit for ground lug mounting

### Standards Compliance

- IEEE 802.3af Power-over-Ethernet
- IEEE 802.3at PoE+ Standards
- IEEE 802.3 Ethernet Standards
- IEEE 802.3u Auto Negotiation
- RFC-2474
- RFC-2475 DiffServ QoS

**B+B SMARTWORX TECHNICAL SUPPORT**

**USA/Canada:** 1 (800) 346-3119 (Ottawa IL USA)

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**STATEMENTS, PRECAUTIONS, GUIDELINES, REGULATORY****FCC RADIO FREQUENCY INTERFERENCE STATEMENT**

This equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The use of non-shielded I/O cables may not guarantee compliance with FCC RFI limits. This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

**POE PRECAUTIONS (INSIDE BUILDING INSTALLATION ONLY)**

**The PoE Giga-MiniMc and PoE+ Giga-MiniMc are for inside-a-building installation only.** Both devices cannot be installed outside-a-building environment, as they cannot meet the PoE requirements, per the PoE standard. If installing the device outside, serious damage can occur and void any B+B SmartWorx warranty.

## ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

Electrostatic discharge (ESD) can cause damage to any product, add-in modules or stand alone units, containing electronic components. Always observe the following precautions when installing or handling these kinds of products.

1. Do not remove unit from its protective packaging until ready to install.
2. Wear an ESD wrist grounding strap before handling any module or component. If the wrist strap is not available, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.
3. Hold units by the edges; do not touch the electronic components or gold connectors.
4. After removal, always place boards on a grounded, static-free surface, ESD pad or in a proper ESD bag. Do not slide the modules or stand-alone units over any surface.



**WARNING!** Integrated circuits and fiber optic components are extremely susceptible to electrostatic discharge damage. Do not handle these components directly unless you are a qualified service technician and use tools and techniques that conform to accepted industry practices.

## FIBER OPTIC CLEANING GUIDELINES

Fiber Optic transmitters and receivers are extremely susceptible to contamination by particles of dirt or dust, which can obstruct the optic path and cause performance degradation. Good system performance requires clean optics and connector ferrules.

1. Use fiber patch cords (or connectors, if you terminate your own fiber) only from a reputable supplier; low-quality components can cause many hard-to-diagnose problems in an installation.
2. Dust caps are installed at the factory to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. Should it be necessary to disconnect the fiber device, reinstall the protective dust caps.
3. Store spare caps in a dust-free environment such as a sealed plastic bag or box so that, when reinstalled, they do not introduce any contamination to the optics.
4. If you suspect that the optics have been contaminated, alternate between blasting with clean, dry, compressed air and flushing with methanol to remove particles of dirt.

## REGULATORY, STANDARDS, COMPLIANCES

UL/cUL: Listed to Safety of Information Technology Equipment, including Electrical Business Equipment.



**Class 1 Laser product, Luokan 1 Laserlaite,  
Laser Klasse 1, Appareil A' Laser de Classe 1**

CE: The products described herein comply with the Council Directive on Electromagnetic Compatibility (2004/108/EC) and the Council Directive on Electrical Equipment Designed for use within Certain Voltage Limits (2006/95/EC). Certified to Safety of Information Technology Equipment, Including Electrical Business Equipment. For further details, contact Advantech B+B SmartWorx.

European Directive 2002/96/EC (WEEE) requires that any equipment that bears this symbol on product or packaging must not be disposed of with unsorted municipal waste. This symbol indicates that the equipment should be disposed of separately from regular household waste. It is the consumer's responsibility to dispose of this and all equipment so marked through designated collection facilities appointed by government or local authorities. Following these steps through proper disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about proper disposal, please contact local authorities, waste disposal services, or the point of purchase for this equipment.



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