BLACK BOX
NETWORK SERVICES

LIC022A-R2	LIC026A-R2	LIC054A-R2
LIC023A-R2	LIC027A-R2	LIC055A-R2
LIC024A-R2	LIC052A-R2	LIC056A-R2
LIC025A-R2	LIC053A-R2	LIC057A-R2

MultiPower Industrial Media Converters

Choose from four different ways to power these hardened media converters.

Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax
724-746-0746 • Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence,
PA 15055-1018 • Web site: www.blackbox.com • E-mail: info@blackbox.com

TRADEMARKS USED IN THIS MANUAL

Black Box and the Double Diamond logo are registered trademarks of BB Technologies, Inc.

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FCC and Industry Canada RF Interference Statements
Class A (using DC terminal power or Power over Ethernet (PoE). This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

Class B (using any DC jack options). This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Certifications

$$C\ E$$

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

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.

blackbox.com

Table of Contents

Part Numbers

Part Number	Description
LIC022A-R2	TP-TX/FX-MM1300-ST (5 km)
LIC023A-R2	TP-TX/FX-MM1300-SC (5 km)
LIC024A-R2	TP-TX/FX-SM1310/PLUS-ST (30 km)
LIC025A-R2	TP-TX/FX-SM1310/PLUS-SC (30 km)
LIC026A-R2	TP-TX/FX-SM1310/LONG-ST (80 km)
LIC027A-R2	TP-TX/FX-SM1310/LONG-SC (80 km)
LIC052A-R2	TP-TX/SSFX-SM1310-SC (1310xmt/1550rcv) (20km)
LIC053A-R2	TP-TX/SSFX-SM1550-SC (1550xmt/1310rcv) (20km)
LIC054A-R2	TP-TX/SSFX-SM1310/PLUS-SC (1310xmt/1550rcv) (40km)
LIC055A-R2	TP-TX/SSFX-SM1550/PLUS-SC (1550xmt/1310rcv) (40km)
LIC056A-R2	TP-TX/SSFX-SM1310/LONG-SC (1310xmt/1550rcv) (60km)
LIC057A-R2	TP-TX/SSFX-SM1550/LONG-SC (1550xmt/1310rcv) (60km)

1. Specifications

Ethernet Connections	10/100 BaseT, Auto Negotiation, Auto-Cross, Flow Control, 1916 MTU, Broadcast Storm Protection, Full Line-Rate Forwarding
DC terminal	7 to 50 VDC, 1-0.1A
DC (jack)	5 VDC
PoE	When MultiPower Industrial Media Converters use PoE technology to be a PD, the maximum supply voltage is 50V
AC Wall Adapter	100 to 240 ±10% VAC input, 5VDC output, 2A max.
Ethernet Connections	10/100 BaseT, Auto Negotiation, Auto-Cross, Flow Control, 1916 MTU, Broadcast Storm Protection, Full Line-Rate Forwarding.
Operating Temperature DC configurations	-13°F to +185°F (-25°C to +85°C)
Operating Temperature With AC wall adapter	+14°F to +122°F (-10°C to +50°C)
Storage Temperature	-40°F to +185°F (-40°C to +85°C)
Humidity	5% to 95% (non-condensing)
Dimensions	0.83"Hx1.80"Wx3.35"D (2.11x4.57x8.51 cm)

2. Overview: About the MultiPower Industrial Media Converters

The MultiPower Industrial Media Converters features 10/100 switching copper-to-fiber conversion. It offers plug-and-play operation, can function as a PD device, and is compliant to the IEEE 802.3af Power over Ethernet (PoE) standard.

The MultiPower Industrial Media Converters are Industrial Ethernet devices and support extended temperature operation of -25°C to +85°C (-10°C to +50°C when using the AC adapter).
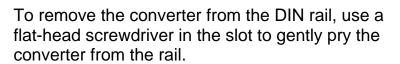
3. Install the MultiPower Industrial Media Converters

The MultiPower Industrial Media Converters install virtually anywhere as a standalone device in locations with extremely limited space. Installation options include:

- Velcro strips
- DIN rail mounting with DIN Rail clips
- PowerTray/18 for high density applications

3.1 DIN Rail Mounting

The MultiPower Industrial Media Converters ship from the factory with DIN clips, allowing installation on a DIN rail. Depending on the installation, the MultiPower Industrial Media Converters can be mounted parallel or perpendicular to the DIN rail. Use the supplied screws to attach the DIN clips to the MultiPower Industrial Media Converters, and then snap the converter to the DIN rail.

To remove the converter from the DIN rail, use a flat-head screwdriver in the slot to gently pry the converter from the rail.

NOTE
The DIN clips are designed for use on a DIN-35 rail.

3.2 Cascading DC Power

When installing multiple MultiPower Industrial Media Converters on a DIN rail, the end user can connect to one DC input source, and then cascade from one DC block to the next, until reaching the maximum current available.

3.3 Powering the MultiPower Industrial Media Converters

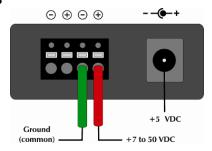The MultiPower Industrial Media Converters includes multiple powering options:

- A country-specific, high-reliability AC power adapter (included)
- The **IEEE 802.3af** Power over Ethernet standard; draws power from power sourcing equipment
- The 4-terminal DC power block
- IE PowerTray 18-Slot AC for Rack Mounting

3.4 About Power over Ethernet (PoE) and MultiPower Industrial Media Converters

Power over Ethernet technology allows the MultiPower Industrial Media Converters to be Powered Devices (PD) and draw power when connected to Power Sourcing Equipment (PSE). Power Sourcing Equipment distributes an electrical current across existing copper data cabling.

3.5 DC Terminal Block Wiring Instructions

The MultiPower Industrial Media Converters can also be powered with the DC terminal block. From a power source, connect to any one positive and any one negative terminal on the MultiPower Industrial Media Converters.

NOTE
When using stranded wire, the leads must be tinned and equivalent to a 16 AWG solid conductor. The DC terminal block is protected against mis-wiring. If the unit is mis-wired, positive power lead to the negative terminal and negative power lead to the positive terminal, it will not function. When powering a unit with voltages near the upper limit of the device's specification (for example: 48 volts) take precautions to limit the voltage at the units terminal block. When turning on high voltage DC circuits, initial voltages may momentarily exceed the unit's specification.

4. Operation

The twisted pair port on the L2 10/100 includes AutoCross, a feature that automatically selects between a crossover workstation or pass through connection depending on the connected device.

4.1 LED Operation

Each MultiPower Industrial Media Converter includes two LEDs, located on the RJ-45 connector.

LED functions are as follows:

FX LNK/ACT	Glows green when a link is established on the fiber port; blinks green when activity is detected on the fiber port.
TX LNK/ACT	Glows amber when a link is established on the copper port; blinks amber when activity is detected on the copper port.

Each module features diagnostic LEDs that provide information on features and ports.

5. Troubleshooting

- During installation, first test the fiber and twisted pair connections with all troubleshooting features disabled, then enable these features, if desired, just before final installation. This will reduce the features' interference with testing.

- When working with units where the features cannot be disabled, establish both the twisted pair and fiber connections before the link LEDs will light.

- To test a L2 by itself, first, have an appropriate fiber patch cable, then follow these steps:
    1. Connect the L2 to the twisted pair device with a twisted pair cable.
    2. Loop a single strand of fiber from the transmit port to the receive port of the L2.
    3. Verify that both the twisted pair and the fiber link are lit (see LEDs, below) on the L2.

- Use the appropriate twisted pair cable, and have the crossover/pass-through switch set correctly.

- Whenever possible, set the devices connected to the L2 (hub, switch, NIC card) to the desired speed and Duplex setting, and turn Auto Negotiation OFF. Refer to Auto Negotiation on L2, also configure the devices on the opposite sides of the L2 to operate at the same speed and Duplex setting.

6. Contacting Black Box

Black Box Customer Service

Order toll-free in the U.S.: Call 877-877-BBOX
(outside U.S. call 724-746-5500)

Free technical support, 24 hours a day, 7 days a week.
Call: 724-746-5500 or Fax: 724-746-0746

Mail order: Black Box Corporation
1000 Park Drive, Lawrence, PA 15055-1018

Web site: www.blackbox.com

E-mail: info@blackbox.com

7. 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 Black Box to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. If you need 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.

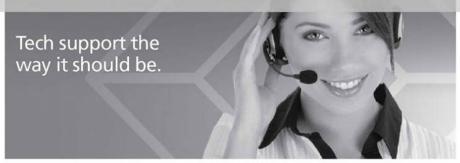## 8.   Electrostatic Discharge Precautions

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 the units by the edges; do not touch the electronic components or gold connectors.

4. After removal, always place the 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.
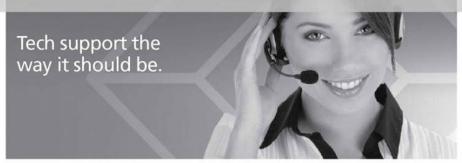
◆ **BLACK BOX**®
NETWORK SERVICES

About Black Box

Black Box provides an extensive range of networking and infrastructure products. You'll find everything from cabinets and racks and power and surge protection products to media converters and Ethernet switches all supported by free, live 24/7 Tech support available in 30 seconds or less.

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