BLACK BOX®
NETWORK SERVICES

LGC320A-R2   LGC324A-R2   LGC328A-R2   LGC322A-NPS
LGC321A-R2   LGC325A-R2   LGC329A-R2
LGC322A-R2   LGC326A-R2   LGC320A-NPS
LGC323A-R2   LGC327A-R2   LGC321A-NPS

Multi-Power Miniature Media Converter 10/100/1000

Provides Gigabit speeds in a robust media converter. Uses duplex multimode, duplex single-mode, or single-strand single-mode fiber, depending on the converter model.

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

FCC and Industry Canada RF Interference Statements
Class A Digital Device. 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 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 A certified device.

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 Industry Canada.

Certifications

CE

> **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.

Table of Contents

Part Numbers

Part Number	Description	Dist	Power
LGC320A-R2	TX/SX-MM850-SC	550m	AC Adapter (included) + DC
LGC321A-R2	TX/LX-SM1310-SC	10km	AC Adapter (included) + DC
LGC322A-R2	TX/LX-SM1310-/PLUS-SC	30km	AC Adapter (included) + DC
LGC323A-R2	TX/LX-SM1550/LONG-SC	80km	AC Adapter (included) + DC
LGC324A-R2	TX/SSLX-SM1310-SC (1310xmt / 1550rcv)	15km	AC Adapter (included) + DC
LGC325A-R2	TX/SSLX-SM1550-SC (1550xmt / 1310rcv)	15km	AC Adapter (included) + DC
LGC326A-R2	TX/SSLX-SM1310/PLUS-SC (1310xmt / 1550rcv)	40km	AC Adapter (included) + DC
LGC327A-R2	TX/SSLX-SM1550/PLUS-SC (1550xmt / 1310rcv)	40km	AC Adapter (included) + DC
LGC328A-R2	TX/SSLX-SM1490/LONG-SC (1490xmt / 1550rcv)	70km	AC Adapter (included) + DC
LGC329A-R2	TX/SSLX-SM1550/PLUS-SC (1550xmt / 1490rcv)	70km	AC Adapter (included) + DC
LGC320A-NPS	TX/SX-MM850-SC	550m	DC only
LGC321A-NPS	TX/LX-SM1310-SC	10km	DC only
LGC322A-NPS	TX/LX-SM1310/PLUS-SC	30km	DC only

1. Specifications

Ethernet Connections	10/100/1000 BaseT
	Auto Negotiation
	AutoCross
	Flow Control
	1632 MTU
	Full Line-Rate Forwarding
DC Input	7 to 50 VDC on DC terminal block 5 VDC on DC jack
AC Wall Adapter	100 to 240 ±10% VAC input, 5 VDC output, 2A max
Power Tray 18-Slot AC for Miniature Converters	125W, 20A @ 5V
Power Consumption	600mA @ 5 VDC
Operating Temperature	-13°F to +185°F (-25°C to +85°C) DC terminal block +14°F to +122°F (-10°C to +50°C) with Black Box supplied AC wall adapter
Storage Temperature	-40°F to +185°F (-40°C to +85°C)
Humidity	5% to 95% (non-condensing); 0 to 10,000 ft. altitude
Dimensions	0.83"H x 1.80"W x 3.35"D (2.11 x 4.57 x 8.51 cm)

2. Overview: About the Multi-Power Miniature Media Converter 10/100/1000

The Multi-Power Miniature Media Converter 10/100/1000 Auto Negotiating switching miniature media converter. The fiber port always operates at 1000 Mbps Full Duplex; the copper port Auto negotiates the connected device's speed and duplex mode; 10/100/1000 Mbps Half Duplex; or 10/100/1000 Mbps Full Duplex (including Flow Control). The Multi-Power Miniature Media Converter 10/100/1000 supports jumbo packets up to 1632 bytes.

The IE represents the unit's use as an Industrial Ethernet device, which allows for extended temperature operation of -25°F to +85°F (-10°C to +50°C) when using the included AC adapter.

The Multi-Power Miniature Media Converter 10/100/1000 offers plug-and-play operation, including the AutoCross feature which automatically selects between a crossover workstation and straight-through repeater hub connection depending on the connected device.

The Multi-Power Miniature Media Converter 10/100/1000 can use either the included Black Box universal, external power adapter with 100 to 240 ±10% VAC input, or can be wired directly to the 7 to 50 VDC terminal block (for extended temperature configuration).   There is an optional Power Tray 18-Slot AC for Miniature Converters in which up to 18 Multi-Power Miniature Media Converters can be installed. When installing the Multi-Power Miniature Media Converter 10/100/1000 in an 18 slot tray or using DC power, the temperature range supported is -13°F to +185°F (-25°C to +85°C).

3. Install the Multi-Power Miniature Media Converter 10/100/1000

Multi-Power Miniature Media Converter 10/100/1000 installs virtually anywhere: as a standalone device. Installation options include:

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

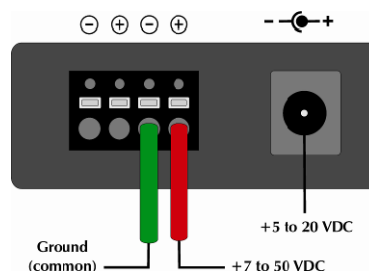| NOTE |
| --- |
| *Several models of the Multi-Power Miniature Media Converter 10/100/1000 support single-strand fiber for operation. Since single-strand fiber products use optics that transmit and receive on two different wavelengths, single-strand fiber products must be deployed in pairs. For example, connect a Multi-Power Miniature Media Converter 10/100/1000, TX/SSLX-SM1310-SC (which has 1310 xmt and 1550 rcv) to a product which has 1550 xmt and 1310 rcv, e.g. High Density Media Converter System II Layer 1 Modules, TX/SSLX-SM1550-SC. The two connected products must also have the same speed and distance capabilities (i.e. both are single-mode [20km] or both are single/PLUS [40km]).* |

3.1 Powering the Multi-Power Miniature Media Converter 10/100/1000

Multi-Power Miniature Media Converter 10/100/1000 supports multiple powering options.

- A country-specific AC power adapter (included)
- The 4-terminal DC power block
- Power Tray 18-Slot AC for Miniature Converters
- Dual USB cable
- IE-Power/5V DIN rail mount power supply

3.1.1 DC Terminal Block Wiring Instructions

The Multi-Power Miniature Media Converter 10/100/1000 can be powered via the DC terminal block. From a power source, connect to any one positive and any one negative terminal on the Multi-Power Miniature Media Converter 10/100/1000.

Connected to Chassis

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.

3.2 DIN Rail Mounting

The Multi-Power Miniature Media Converter 10/100/1000 ships from the factory with DIN clips, allowing installation on a DIN rail. The Multi-Power Miniature Media Converter 10/100/1000 mounts perpendicular to the DIN rail (as shown).

Use the supplied screws to attach the DIN clips to the Multi-Power Miniature Media Converter 10/100/1000, 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.

3.3 Cascading Power

When installing multiple Multi-Power Miniature Media Converter 10/100/1000 units on a DIN rail, connect to one DC input source and then cascade from one DC block to the next, until reaching the maximum electrical current available.

3.4 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 7 to 50VDC rated equipment, it must be installed only per the following conditions:

    a. Connect the equipment to a 7 to 50VDC supply source that is electrically isolated form the alternating current source. The 7 to 50V DC source must be connected to a 7 to 50VDC SELV source.

    b. The maximum terminal voltage is 50VDC.

    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. Operation

4.1 LED Operation

Each Multi-Power Miniature Media Converter 10/100/1000 includes two LEDs, located on the RJ-45 connector. LED functions are as follows:
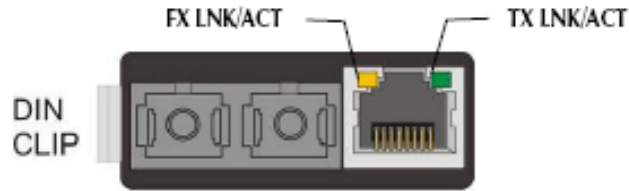
FX LNK/ACT   Glows green when a link is established on the fiber port; blinks green when activity is detected on the fiber port.

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

5. 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

6. 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.

7. 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.