

Industrial SFP/SFP Multi-Power Mode Converter

**Converts any fiber optics interface  
to any other fiber optics type interface.**



**Customer  
Support  
Information**

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PA 15055-1018 • Web site: [www.blackbox.com](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)

### **FCC and Industry Canada RF Interference Statements**

Class B Digital Device. 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**

**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.



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**Part Numbers**

Part Number	Description
LGC300A-R2	MultiPower SFP to SFP Mode Converter (SFPs sold separately)

### 1. Specifications

DC Input	+7 VDC to +50 VDC @ 2.5 watts. Actual current consumption may vary depending on the type of SFP modules installed. When not using the supplied AC/DC converter the externally supplied DC power must be provided from a LPS source.
AC Wall Adapter	100 to 240 $\pm$ 10% VAC input, 5 VDC output @ 2A max.
Operating Temperature	-13°F to +185°F (-25°C to +85°C) DC configuration +14°F to +122°F (-10°C to +50°C) with Franmar AC wall adapter
Storage Temperature	-49°F to 185° F (-45°C to 85° C)
Shipping Weight	0.25 lbs (0.11 kg)
Dimensions	0.83" H x 1.80" W x 3.35" D (2.11 x 4.57 x 8.51 cm)

#### 1.1 Standards/Compliance

- SFP-MSA SFP standard (September 14, 2000)
- SFF-8472 DDMI standard (Revision 1.0)

All SFPs used in this product should be certified to IEF 60825-1.

## **2. Overview: About the Industrial SFP/SFP Multi-Power Mode Converter**

The Industrial SFP/SFP is a pure mode converter that converts any fiber optics type to any other fiber optics type. This product is a Protocol independent converter and is not intended for applications that require retiming or any Layer 2 functions. The Industrial SFP/SFP supports extended temperature operation.

The Industrial SFP/SFP requires two small form-factor (SFP) modules (sold separately), which provide greater fiber flexibility in the network environment. The hot-swappable nature of the SFPs and the numerous fiber modes and types available in SFPs allow for easy configuration and future upgrading as network demands evolve. The SFP modules must be MSA compliant and support the same speed range.

The Industrial SFP/SFP operates as a mode converter only and not as a rate converter.

The Industrial SFP/SFP does not provide support for copper (TX) SFPs.

### **2.1 Features**

The Industrial SFP/SFP provides the ability to change optical transport characteristics using easy-to-install SFP devices. This mix-and-match functionality is only limited by the available Black Box SFP units. For more information about SFPs, visit <https://www.blackbox.com>

The key features of the Industrial SFP/SFP are:

- Uses Miniature Media Converter Form Factor
- Supports a 7 VDC to 50 VDC terminal block option with cascading power
- Supports an external 5 VDC power option (not extended temperature)
- Allows extended temperature range from -13°F to 185° F (25°C to 85°C)
- Uses all standard MSA-complaint SFP devices (excluding copper SFPs)
- Provides extensive diagnostic LED functions
- Supports DIN Rail mounting

### 3. Install the Industrial SFP/SFP Multi-Power Mode Converter

The Industrial SFP/SFP Multi-Power Mode Converter installs anywhere as a standalone, table-top device or on a DIN rail.

As a standalone device, install it in locations with limited space.

If multiple connections are required, use an IE-PowerTray/18 enclosure (sold separately). The tray allows for 18 conversions in a 1.5 rack unit of space. The units can also be powered by daisy-chaining DC power (refer to Cascading DC Power).

#### 3.1 SFP Port Requirements

The Industrial SFP/SFP Multi-Power Mode Converter requires two SFP Modules of the same speed, either two Fast Ethernet (100Mbps) modules or two Gigabit Ethernet (1000Mbps) modules.

#### 3.2 DIN Rail Mounting

The Industrial SFP/SFP Multi-Power Mode Converter includes two DIN clips, allowing installation on a DIN rail. It mounts perpendicular to the DIN rail (as shown).

Use the supplied screws to attach the DIN clips to the Industrial SFP/SFP, 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.*

#### 3.3 Powering the Industrial SFP/SFP Multi-Power Mode Converter

The Industrial SFP/SFP Multi-Power Mode Converter requires an external DC power source and has three options for powering as options:

- Universal AC power adapter with country specific clip (not included with module version).



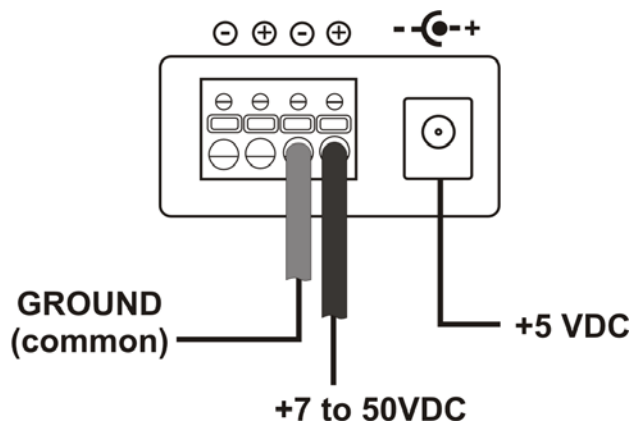
## Chapter 3: Install the Industrial SFP/SFP Multi-Power Mode Converter

- User supplied LPS DC power via a four-position DC power block.
- Power from an Power Tray 18-Slot DC

For extended temperature operation the DC terminal block must be used because the supplied AC to DC converter is not rated for extended temperature operation. The power source used with the DC terminal block should be a Limited Power Source (LPS).

### 3.3.1 DC Terminal Block Option

The Industrial SFP/SFP DC power option includes a 7 VDC to 50 VDC terminal block and a standard +5 VDC mini-jack. The DC terminal block has multiple DC inputs intended for cascading DC power to an adjacent unit.



Connect the power source to any one positive and one negative terminal on the Industrial SFP/SFP.

#### NOTE

*When using stranded wire, the leads must be tinned. The chassis is not protected against mis-wiring; if mis-wired the chassis will not function. The chassis is internally connected to the negative power terminal.*

### 3.3.2 Cascading DC Power

If installing multiple Industrial SFP/SFPs on a DIN rail, you can use one DC input source and then cascade from one DC terminal block to the next, until reaching the maximum electrical current available.



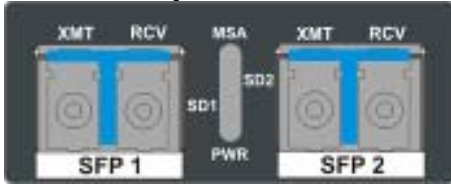
### 3.4 DC Power Supply Precautions

The following precautions must be observed when installing the chassis model with an internal DC power supply.

1. Check nameplate ratings to ensure there is no overloading of supply circuits that could effect overcurrent protection and supply wiring.
2. In addition, the following must be observed:
  - a. Connect the equipment to a 35 to 50 VDC power source that is electrically isolated from the alternating current source. The 35 to 50 VDC power source is connected to a SELV DC source.
  - b. Route input wiring to terminal block and secure in such a manner that it is protected from damage and stress. Do not route wiring past sharp edges or moving parts.
  - c. Incorporate a readily accessible disconnect device, with a 3mm minimum contact gap in the fixed wiring.
3. 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.

## 4. Operation

### 4.1 LED Operation



The Industrial SFP/SFP+ contains four status LED indicators. Each LED is dual color and has three states: off, red, or green. A loss of signal on one SFP causes the TX of the other SFP to turn off. This action does not activate the red TX Fault LED.

LED	Color or State		
	Red	OFF	Green
PWR	Card does not pass the self-test.	Unit does not have power.	Power is applied to the card. All internal self-test functions must pass before the PWR LED is green.
SD 1 SD 2	LED transmitter has an active fault.	No active fault on transmitter.  LOS indication on receiver.	Valid signal is detected by the SFP and LED transmitter is not in fault.
MSA LEDs	One or both SFPs are not installed or not detected. The TX inhibit must not be active if a SFP is missing.* Or, both SFPs are installed, but their speed settings are different. This condition disables both SFPs.	N/A	Indicates that both SFPs with the same speed are securely installed.

\* To help in troubleshooting, the **Link Loss** (LL) feature is always ON. That is, if a LOS is detected on an incoming SFP port, the Optical transmitter on the other SFP port is turned OFF. This provides a Link Loss carry forward function to alert the device downstream of the existing problem. This function is "ON" in both directions at the same time. The LL function is inhibited if either SFP is not installed.

## 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](http://www.blackbox.com)

**E-mail:** [info@blackbox.com](mailto:info@blackbox.com)

WARNING	
	Disconnect all power supplies before servicing.

### 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.

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LGC300A-R2 Rev. 1

55-80619BB-00 Rev. B1

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