MiLAN®
TECHNOLOGY

Raven Series Gigabit Fiber Advanced Media & Rate Converters

MIL-RC6113LX
10/100/1000Base-TX /1000Base-LX SC SMF

MIL-RC6113SX
10/100/1000Base-TX / 1000Base-SX SC MMF

USER GUIDE

Regulatory Approval

- FCC Class A
- UL 1950
- CSA C22.2 No. 950
- EN60950
- CE
- EN55022 Class A
- EN55024

Canadian EMI Notice
This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

European Notice
Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community Compliance with these directives imply conformity to the following European Norms:

- EN55022 (CISPR 22) - Radio Frequency Interference
- EN61000-X - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

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To Contact MiLAN Technology

For prompt response when calling for service information, have the following information ready:
- Product serial number and revision
- Date of purchase
- Vendor or place of purchase

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1. Introduction

The Raven Series Gigabit Fiber Advanced Media & Rate Converters are standalone units that can be used alone or in a 10-slot rackmount chassis to connect networks with 10/100/1000Base-TX or 1000Base-T and 1000BASE-FX cabling.

These advanced media & rate converters extend the cabling distance of 10/100/1000Base-TX (Auto MDI/MDIX) or pure 1000Base-T networks up to 550m for multi-mode fiber or 10 kilometers for single-mode fiber.

Figure 1-1. The Raven Series Gigabit Fiber Media Converter Module

Each converter is available with one SC multi-mode fiber connector or SC single mode fiber connector, plus one Ethernet RJ-45 port (Auto MDI/MDIX) for your 10/100/1000Base-TX copper cable or pure 1000 Base-T copper cable connection. DIP-switches allow for setting the operation mode for UTP, Fiber and link loss forwarding function.

Features

- Converter conforms to IEEE 802.3, 802.3u, and 802.3x, IEEE 802.3ab 1000BaseT, IEEE 802.3z 1000BaseSX/LX standards.
- Convert between UTP cabling and Fiber-optic cabling.
- One RJ-45 connector, Auto-MDI/MDIX for UTP port.
- Supports 10/100/1000 Mbps Auto-negotiation for UTP port.
- Fiber cabling connectivity up to 10Km.
- Uses store-and-forward switching to separate two collision domains.
- One fiber connector (SC/SC Single mode) for 1000Base-FX.
- Prevents packet loss by supporting backpressure & flow control.
- DIP-switches to set the operation mode and Link-Loss-Forwarding function.
- LEDs for each port: Speed, Link, Activity, Full, Collision.
- LEDs for each unit: Power.
- External DC power adapter 9V/0.7A.
- FCC Class A, CE, UL, and CUL Mark certification.

Package Contents

Unpack the contents of the package and verify them against the appropriate checklist below.

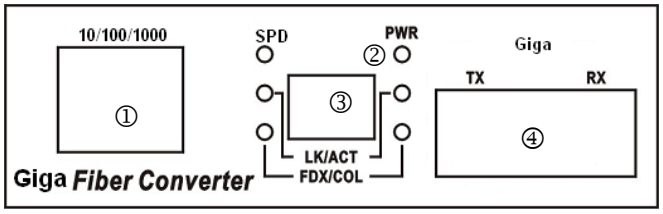
- Gigabit Fiber Converter
- AC-DC Power Supply
- Users Guide
- Rackmount Kit
- Warranty Card

If any item is missing or damaged, please contact your local dealer for service.

2.
Hardware Description

Front Panel

The Front Panel of the **Raven Series Gigabit Fiber Converter** consists of one Gigabit Fiber port, one RJ-45 Port (Auto MDI/MDIX), and 6 LED Indicators (SPD, LK/ACT, FDX/COL, Fiber LK/ACT, FDX/COL, and PWR).



(1) RJ-45 Port (3) DIP-Switch
(2) LED (4) Fiber Connector

Figure 2-1. Front Panel for Raven Series Gigabit Fiber Converters

Ports

- **RJ-45 Port (Auto MDI/MDIX):** The Ethernet RJ-45 will auto-sense for 10Base-T, 100Base-TX, or 1000Base-X connections. Auto MDI/MDIX allows connections to another switch or workstation without changing non-crossover or crossover cabling.
- **Gigabit Fiber Port:** The Gigabit Fiber port is for 1000Base-FX connections. SC multi-mode (SX) and SC single mode (LX) fiber connections are available.

LED Indicators

There are 6 diagnostic LEDs located on the front panel of each converter module. They provide a real-time indication of systematic operation status. The following table provides descriptions of the LED statuses and meaning.

LED	Status	Meaning
PWR	Green	Power on
SPD	Green	1000Mbps UTP Speed
	Orange	100Mbps UTP Speed
	OFF	10Mbps UTP Speed
LK/ACT (UTP)	Green	The unit is linking with its link partner.
	Blinks	The unit is transmitting or receiving packets from UTP devices.
	Off	No device attached
LK/ACT (Fiber)	Green	The unit is linking with its link partner.
	Blinks	The unit is transmitting or receiving packets from FX devices.
	Off	No device attached
FDX/COL (UTP)	Orange	The UTP port is operating in full-duplex mode.
	Blinks	Collision of Packets occurs in the port.
	Off	Half-duplex mode or no device attached
FDX/COL (Fiber)	Orange	The fiber port is operating in full-duplex mode.
	Blinks	Collision of Packets occurs in the port.
	Off	Half-duplex mode or no device attached

Table 2-1. Gigabit Fiber Converter LED-indicator statuses and meaning

DIP-Switches

The DIP-switches are used to configure operation mode for LLF (**Link Loss Forwarding)** and operation mode for the UTP and Fiber ports. The default value of each DIP-switch is **OFF**.

S/W No	Status	Description
1	ON	Fiber in 1000Mbps Full Duplex
	OFF	Fiber Auto-Negotiation
2	ON	UTP to Fiber LinkSentry Enabled
	OFF	UTP to Fiber LinkSentry Disabled
3	ON	Fiber to UTP LinkSentry Enabled
	OFF	Fiber to UTP LinkSentry Disabled

Table 2-2. Gigabit Fiber Converter DIP-Switch statuses and meaning

LinkSentry: Enabling LinkSentry allows UTP link failures to be reported to the fiber side or Fiber link failures to be reported to the UTP side.

Note: Data errors may occur if DIP-Switch settings are changed while the UTP or Fiber ports are transmitting or receiving data.

Rear Panel

The rear panel of the converter contains a power socket. This power socket accepts DC9V voltage and minimum 0.7A supplied current.

Figure 2-3. Gigabit Fiber Converter Rear Panel

3.
Installation

Converter Module

A. Remove the blank bracket by rotating thumbscrew counterclockwise. Do not discard the blank bracket.
B. Open the rackmount ear kit. Each kit contains two rackmount ear pieces (with thumbscrews) and four screws.
C. Attach one rackmount ear on each side of the converter using a screwdriver.

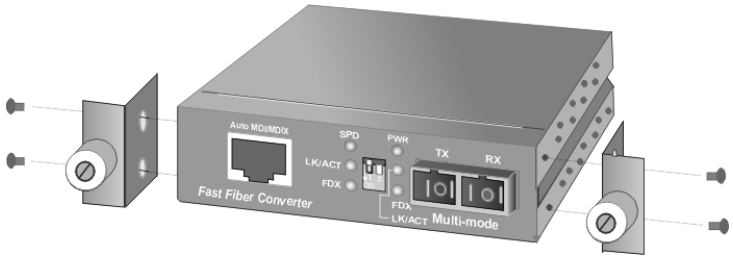


Figure 3-1. Attach mounting brackets with screws

Rackmount Chassis

A. Insert the modular converter module into the guides of the conversion system chassis by sliding it smoothly until it stops. Press firmly until the power plug in the chassis plugs into the modular converter module receptacle.

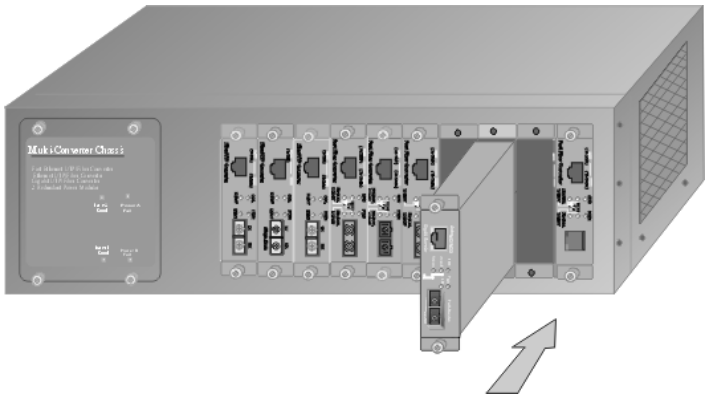


Figure 3-2. Installing Gigabit Fiber Converter into Chassis

B. Gently push the thumbscrews in and turn clockwise to tighten. Do not over tighten the thumbscrews.

Cabling

Use four twisted-pair, Category 5 cabling for RJ-45 port connections. The cable between the converter and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

Fiber segments using **single-mode** connector type connections must use 8/125 or 9/125 um single-mode fiber cable. Two devices may be connected up to **10 Kilometers** in full duplex operation. For half-duplex operation, the recommended maximum distance is 412 meters (1,352 ft.)

Fiber segments using **multi-mode** connector type connections must use 50 or 62.5/125 um multi-mode fiber cable. Two devices may be connected up to **550 meters**.

4.
Troubleshooting

This section is intended to help solve some common problems encountered while using the Raven Series Gigabit Fiber Advanced Media & Rate Converter products.

- Verify that the correct power adapter (DC 9V, 0.7A) is in use. Power adapters with DC output higher than 9V will seriously damage the converter modules.
- Verify the DIP-switch configuration is set to the same operational mode as the link partner.
- Ensure the proper UTP and Fiber cables have been selected to construct the network.
- Verify each link partner is using the same fiber mode; multi-mode and single mode fiber cannot be used simultaneously within the same configuration.

5.
Technical Specifications

This section provides the technical specifications of the Raven Series Gigabit Fiber Advanced Media & Rate Converter products.

Standard	IEEE802.3 10BASE-T IEEE802.3u 100BASE-TX/100BASE-FX IEEE 802.3ab 1000BaseT, IEEE 802.3z 1000BaseSX/LX standards IEEE802.3x Flow Control and Back pressure
Connector	**Fiber:** SC/SC(SM) **RJ-45 Socket:** CAT-5 (10/100/1000Mbps or pure 1000Mbps) Twisted Pair cable Auto MDI/MDI-X and Auto-Negotiation Function Support
Switch Architecture	Store and Forward
Fiber Parameters	**Fiber Core:** Multi-Mode (62.5/125um, 50/125um), Single-Mode (8/125um, 9/125um) **Wavelength:** 850nm(Multi-mode), 1310nm(Single-mode) **Fiber Distance**: 550M (Multi-Mode Fiber) 10 KM (Single-Mode Fiber)
Transparent Packet	64 to 1536 Bytes for Ethernet packet

Link Loss Forward	UTP➔Fiber: If UTP port link is down, then the converter will force the fiber port to link down. Fiber ➔ UTP: If Fiber port link is down, then the converter will force the UTP port to link down.
DIP Switch	DIP Switch 1: Fiber Auto-Nego/1000Mbps Full Duplex mode DIP Switch 2: UTP ➔Fiber LLF Disable/Enable DIP Switch 3: Fiber➔ UTP LLF Disable/Enable
LED	Power, UTP (SPD, LK/Act, FDX/COL), Fiber (LK/Act, FDX/COL)
Power	Stand-alone (external adapter): DC9V / 0.7A
Dimension	119mm x 85mm x 26mm
EMI & Safety	FCC Class A, CE, UL, CUL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