FCC Statement

The FCC (Federal Communications Commission) restricts the amount of radio frequency emission and radiation coming from computer equipment.
The equipment introduced in this manual has been tested and found to comply with the limits for a Class A digital 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 case the user is required to correct the interference at his/her own expense.
Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

Trademarks

Product names mentioned in this manual may be trademarks or registered trademarks of those products.
All trademarks or brand names mentioned are properties of their respective companies.

Preface

This manual describes how to install and use the Gigabit Ethernet Media Converter. The Converter introduced here provides one channel media conversion solution:

1000Base-T ↔ 1000Base-SX/LX (multi-mode/single-mode) with link-fault-pass-through function
1000Base-SX ↔ 1000Base-LX (multi-mode ↔ single-mode)
1000Base-LX ↔ 1000Base-LX (single-mode ↔ single-mode)

1000Base-T ↔ 1000Base-LX (WDM single-mode) with link-fault-pass-through function
1000Base-SX ↔ 1000Base-LX (multi-mode ↔ WDM single-mode)
1000Base-LX ↔ 1000Base-LX (WDM single-mode ↔ WDM single-mode)

The Gigabit Ethernet Media Converter fully complies with IEEE802.3ab 1000Base-T and IEEE802.3z 1000Base-SX/LX Gigabit Ethernet standards.

In this manual, you will find:

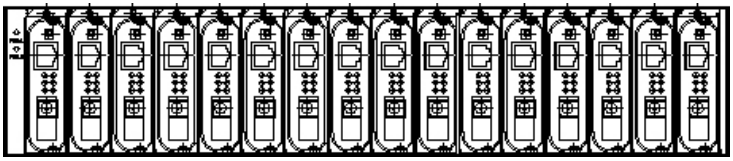
- Product overview
- Features on the media converter
- Illustrative LED functions
- Installation instructions
- Specifications

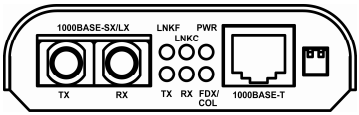
Table of Contents

Introduction

The Gigabit Ethernet Media Converter provides one channel for media conversion between 1) 1000Base-T and 1000Base-SX/LX with link-fault-pass-through function or 2) 1000Base-SX/LX and 1000Base-LX. It can be used as a stand-alone device or with a standard 19" chassis as shown below.

Product Overview





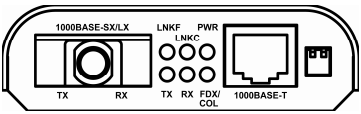


Figure 1:
1000Base-T ↔ 1000Base-SX/LX (multi-mode/single-mode) Media Converter with link-fault-pass-through function

1000Base-T ↔ 1000Base-LX (WDM single-mode) Media Converter with link-fault-pass-through function

<NOTE> The chassis is to be ordered separately.

Product Features

- One-channel media conversion between:
  1000Base-T and 1000Base-SX/LX, 1000Base-SX/LX and 1000Base-LX
- Fiber media allows either:
  Multi-mode fiber, Single-mode fiber, or WDM Single-mode fiber
- Full wire-speed forwarding rate
- Front panel status LEDs
- Used as a stand-alone device or with a chassis
- Hot-swappable when used with a chassis
- Make sure to make a connection to the TX port before make a connection to the fiber port, a link condition will be sensed on the fiber port whenever the media converter detects a link condition on the TX port

1000T ↔ 1000SX/LX Media Converter

- There are two pins on the DIP switch of the 1000Base-T and 1000Base-SX/LX one-channel media converter:
  - ♦ Toggle up the pin on the left-hand side to let the fiber port auto detect duplex mode.
  - ♦ Toggle down the pin on the left-hand side to force the fiber port to full duplex mode.
  - ♦ Toggle up the pin on the right-hand side to disable the link-fault-pass-through function.
  - ♦ Toggle down the pin on the right-hand side to enable the link-fault-pass-through function.

DIP switch	Up (Default Setting)	Down	
Left-hand side	The fiber port auto detects duplex mode	Force the fiber port to full duplex mode	
Right-hand side	Disable LFPT	Enable LFPT	LFPT: link-fault-pass-through function

<Note> Power must be on/off after re-setting LFPT function.

- The TX port auto detects duplex mode

- The TX port supports auto MDIX for uplink purpose

<Note> One of the fiber ports should be forced to full duplex mode and the other fiber port should be set to auto detect duplex mode when two 1000Base-T and 1000Base-SX/LX one-channel media converters are connected to each other via fiber port.

Packing List

When you unpack this product package, you will find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

- The Media Converter
- User's Manual
- AC to DC Power Adaptor

One-Channel Media Converter

Physical Ports

1000T ↔ 1000SX/LX Media Converter

This converter provides one TX port and one FX port. For the FX port, it provides options of multi-mode, single-mode, or WDM single-mode fiber. For the TX port, it uses RJ-45 connector and supports auto MDIX for uplink purpose.

1000SX/LX ↔ 1000LX Media Converter

This converter provides two FX ports:
1) One multi-mode/single-mode fiber port and one single-mode fiber port.
2) One multi-mode/WDM single-mode fiber port and one WDM single-mode fiber port.

Port Status LEDs

The LED indicators give you instant feedback on status of the converter:

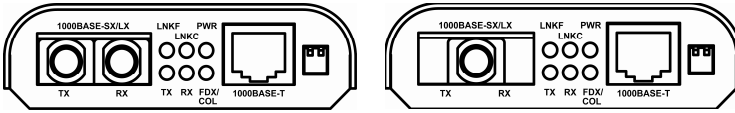
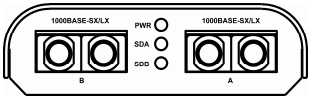
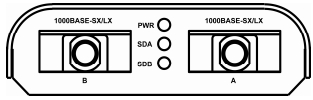


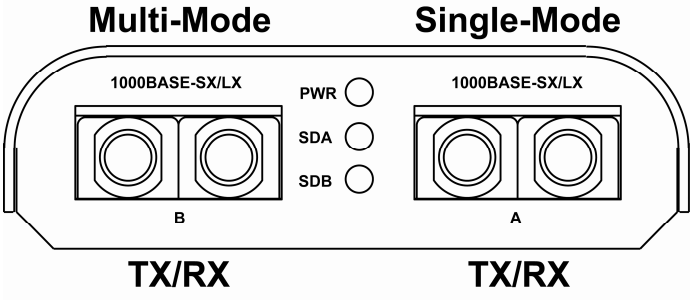
Figure 2:
1000Base-T ↔ 1000Base-SX/LX (multi-mode/single-mode) Media Converter with link-fault-pass-through function

1000Base-T ↔ 1000Base-LX (WDM single-mode) Media Converter with link-fault-pass-through function

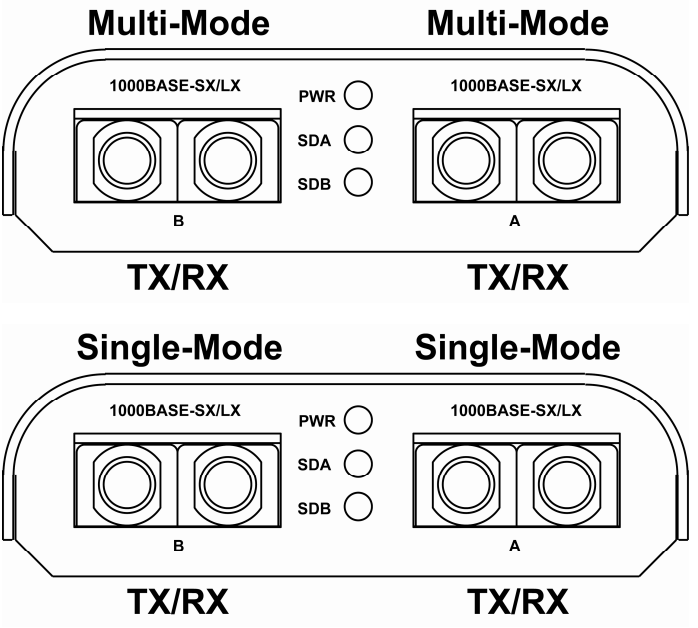
LEDs	State	Indication
Power	Steady	Power feeding in
	Off	No power
LNKC	Steady	TX port: A valid network connection established. LNKC stands for LINK/Copper
	Off	No connection
LNKF	Steady	FX port: A valid network connection established. LNKF stands for LINK/Fiber
	Off	No connection
FDX/COL	Steady	Connection in full duplex mode FDX stands for FULL DUPLEX
RX	Steady	Receiving data
	Off	No reception
TX	Steady	Transmitting data
	Off	No transmission







B = Multi-Mode, A = Single-Mode



<Note>
Fiber transceivers can be 1000Base-SX/LX or WDM 1000Base-BX.
When two fiber transceivers have different signal transmission distances. Fiber transceiver with shorter signal transmission distance would be on left-hand side of media converter front panel (B). Fiber transceiver with longer signal transmission distance would be on right-hand side of media converter front panel (A).

Figure 3:
1000Base-SX ↔ 1000Base-LX (multi-mode ↔ single-mode) Media Converter
1000Base-LX ↔ 1000Base-LX (single-mode ↔ single-mode) Media Converter

1000Base-SX ↔ 1000Base-LX (multi-mode ↔ WDM single-mode) Media Converter
1000Base-LX ↔ 1000Base-LX (WDM single-mode ↔ WDM single-mode) Media Converter

LEDs	State	Indication
Power	Steady	Power feeding in
	Off	No power
SDA	Steady	Port A Signal Detect: A valid network connection established.
	Off	No connection
SDB	Steady	Port B Signal Detect: A valid network connection established.
	Off	No connection

Installation

This chapter gives step-by-step installation instructions for the Converter.

Selecting a Site for the Equipment

As with any electric device, you should place the equipment where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

- The ambient temperature should be between 32 and 113 degrees Fahrenheit (0 to 45 degrees Celsius).
- The relative humidity should be less than 90 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards for IEC 801-3, Level 2 (3V/M) field strength.
- Make sure that the equipment receives adequate ventilation. Do not block the ventilation holes of the equipment.
- The power outlet should be within 1.8 meters of the product.

Connecting to Power

This Converter is a plug-and-play device.

Step 1: Connect the supplied AC to DC power adapter to the receptacle at the back of the converter.
Step 2: Attach the plug into a standard AC outlet.

Installing in a Chassis

The Converter is designed to fit into any of the expansion slots on a rackmount chassis.

Step 1: Unscrew the carrier from the desired expansion slot on the chassis.
Step 2: Fit the converter onto the carrier.
Step 3: When the converter is completely seated onto the carrier, insert the carrier to the guide rails of the expansion slot.
Step 4: Carefully slide in the carrier until it is fully and firmly fit the chassis.
Step 5: Fasten the carrier to the chassis by the screws.

<NOTE> Never insert any converter into the chassis directly without using the supplied carriers. The carriers allow secure and consistent placement of the converters into the chassis' backplane without causing any damage.

Specifications

Applicable Standards	IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-SX/LX
Fixed Ports 1000Base-T to 1000Base-SX/LX: 1000Base-SX/LX to 1000Base-LX:	 1 TX port, 1 FX port 2 FX ports
Speed	2000Mbps for full-duplex
Forwarding rate	1,488,100pps for 1000Mbps
LED Indicators 1000T↔ 1000SX/LX: 1000SX/LX ↔ 1000LX:	 Power; TX; RX; FDX/COL; LNKF; LNKC Power; SDA; SDB
Dimensions	80.3mm (W) × 109.2mm (D) × 23.8mm (H) (3.16" (W) × 4.3" (D) × 0.94" (H))
Weight	150g (0.33lb.)
Power	External power adaptor 0.2A @ 12VDC
Power Consumption	2.4W Max.
Operating Temperature	0°C ~ 45°C (32°F ~ 113°F)
Storage Temperature	-10°C ~ 70°C (14°F ~ 158°F)
Humidity	5 ~ 95%, non-condensing
Safety	UL60950-1
Emissions	FCC part 15 Class A, CE Mark Class A

Ordering Information

1000T ↔ 1000SX/LX Media Converter

#	Gigabit Ethernet	Cable / Connector	Distance
Port One			
	1000Base-T	4-pairs Cat. 5 / RJ-45	100m
Port Two Options			
	1000Base-SX	MMF of 850nm (62.5/125μm) / SC	220m
	1000Base-SX	MMF of 850nm (50/125μm) / SC	550m
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	10km
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	SMF of 1550nm (9 or 10/125μm) / SC	50km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	40km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	40km

<NOTE>

i. The maximum node-to-node network distance is in full duplex operation.

ii. MMF denotes Multi-Mode Fiber. SMF denotes Single-Mode Fiber.

iii. MMF can be applied for 1000Base-LX as well.

1000SX ↔ 1000LX Media Converter

#	Gigabit Ethernet	Cable / Connector	Distance
Port A Options			
	1000Base-SX	MMF of 850nm (62.5/125μm) / SC	220m
	1000Base-SX	MMF of 850nm (50/125μm) / SC	550m
Port B Options			
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	10km
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	SMF of 1550nm (9 or 10/125μm) / SC	50km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	40km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	40km

1000LX ↔ 1000LX Media Converter

#	Gigabit Ethernet	Cable / Connector	Distance
Port A			
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	10km
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	SMF of 1550nm (9 or 10/125μm) / SC	50km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	40km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	40km
Port B			
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	10km
	1000Base-LX	SMF of 1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	SMF of 1550nm (9 or 10/125μm) / SC	50km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	20km
	1000Base-LX	WDM SMF of TX:1310nm / RX:1550nm (9 or 10/125μm) / SC	40km
	1000Base-LX	WDM SMF of TX:1550nm / RX:1310nm (9 or 10/125μm) / SC	40km

<NOTE>

i. The maximum node-to-node network distance is in full duplex operation.

ii. MMF denotes Multi-Mode Fiber. SMF denotes Single-Mode Fiber.

iii. MMF can be applied for 1000Base-LX as well.

Appendix

	Fiber budget	Distance	
1000Base-SX	7.5dBm	220m	850nm (62.5/125μm)
1000Base-SX	7.5dBm	550m	850nm (50/125μm
1000Base-LX	14dBm	10km	1310nm (9 or 10/125μm)
1000Base-LX	19dBm	20km	1310nm (9 or 10/125μm)
1000Base-LX	19dBm	50km	1550nm (9 or 10/125μm)
1000Base-LX	12dBm	20km	TX:1310nm / RX:1550nm (9 or 10/125μm)
1000Base-LX	12dBm	20km	TX:1550nm / RX:1310nm (9 or 10/125μm)
1000Base-LX	20dBm	40km	TX:1310nm / RX:1550nm (9 or 10/125μm)
1000Base-LX	20dBm	40km	TX:1550nm / RX:1310nm (9 or 10/125μm)