Chapter 1. Introduction

This chapter gives an overview of the Multi-Converter Chassis and it covers the following items:

- The Multi-Converter Chassis
- Features
- Package Contents

The Multi-Converter Chassis

The Multi-Converter Chassis provides compact management on up to 10 optional modular converter units, which allows your network connectivity to be more flexible. The Multi-Converter Chassis also supports 2 redundant hot-swappable power supplies, and all modular converter units in the Chassis are also hot- swappable units.

Figure 1. The Multi-Converter Chassis with full modular Units

Features

The Multi-Converter Chassis provides convenient rackmount or desktop installation for up to 10 modular 10Base-T/FL, 10/100Base-TX/

Multi-Converter Chassis

100Base-FX, Gigabit converters or modular TP/HomePNA converter. All optional modular converters are connected to power through a factory-installed power supply and power backplane.

- Supports up to 10 optional modular converter units

- All optional modular converter units are hot-swappable

- Supports 10M, 100M, Gigabit, HomePNA modules

- 4 LED indicators for redundant power (good, fail)

- Supports 2 redundant hot-swappable power supplies

- Standard 19-inch rack installation

- FCC Class A, CE mark certification

Package Contents

- Multi-Converter Chassis
- Rackmount kit
- Power cord
- 4 rubber feet
- Warranty card
- User's manual

Multi-Converter Chassis

Power Cord

**Rack-Mount Kit
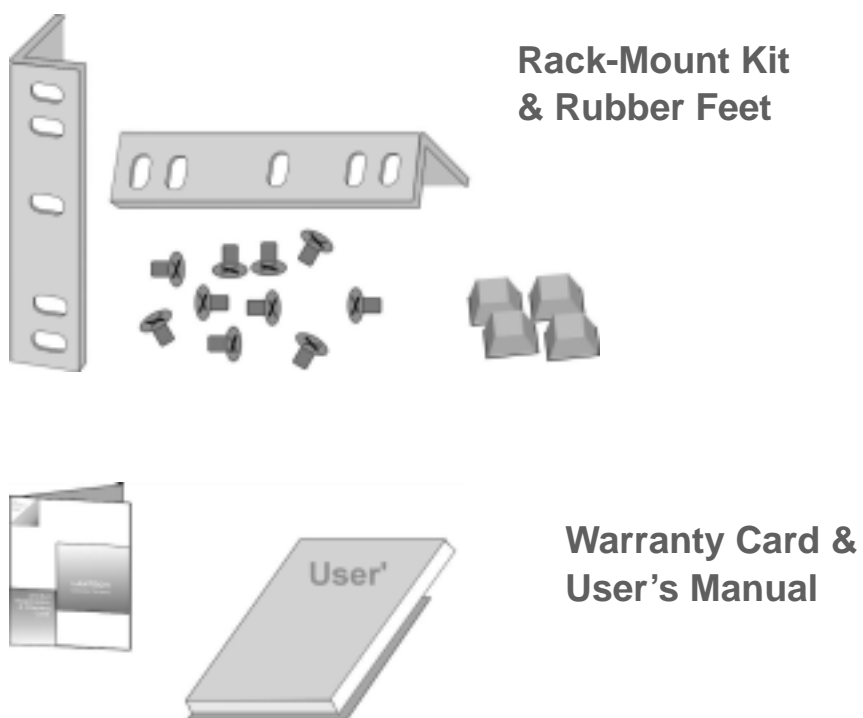& Rubber Feet**

**Warranty Card &
User's Manual**

Figure 2. Package Contents

Compare the contents of your Multi-Converter Chassis package with the standard checklist above. If any item is missing or appears damaged, please keep the carton and original packaging materials if possible in case you need to return the switch for repair.

Chapter 2. Hardware Description

This Chapter describes the hardware of the Multi-Converter Chassis including Front panel, LEDs, Rear panel.

Hardware Description

The Multi-Converter Chassis is a modular unit, and its chassis contains 10 slots for optional modular converters. The Physical Dimensions of the Multi-Converter Chassis are 440mmX 266mmX 133mm.
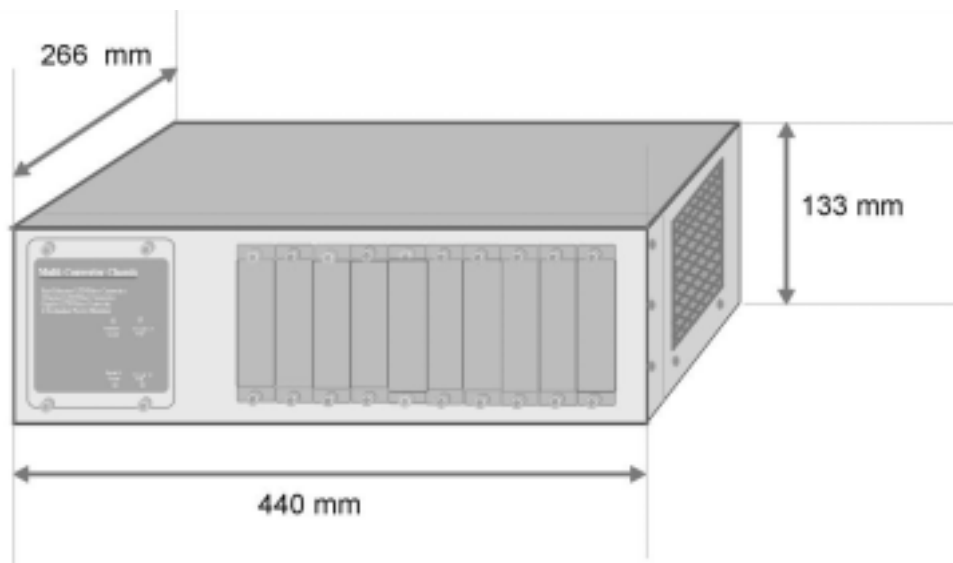

Figure 2-1. Physical Dimensions of the Multi-Converter Chassis

Front Panel

The Front Panel of the Multi-Converter Chassis contains 10 slots for optional modular converters and 4 LEDs to indicate dual redundant power supply status.
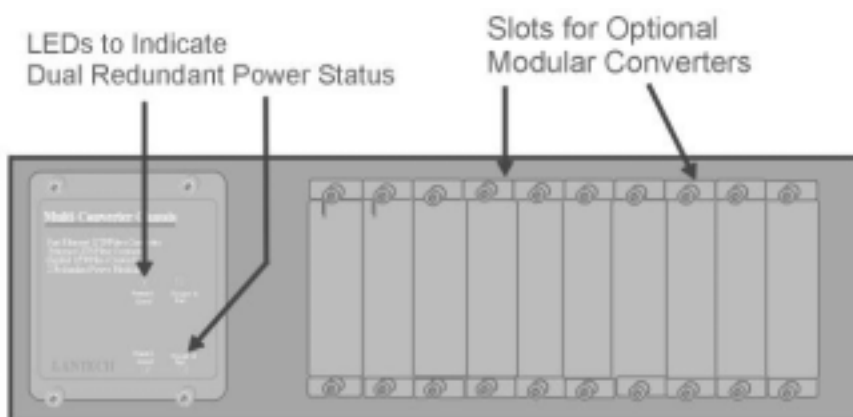
Figure 2-2. The Front Panel of the Multi-Converter Chassis

LEDs

There are four LEDs located on the front panel of the Multi-Converter Chassis. The LEDs are to indicate dual redundant power supply status (Good or Fail).

Real Panel

The 3-pronged power plug, On/off switch and ventilation fan are located at the Rear Panel of the Multi-Converter Chassis displayed in Figure 2-3. The Chassis will work with AC in the range 100-240VAC, 50-60Hz.
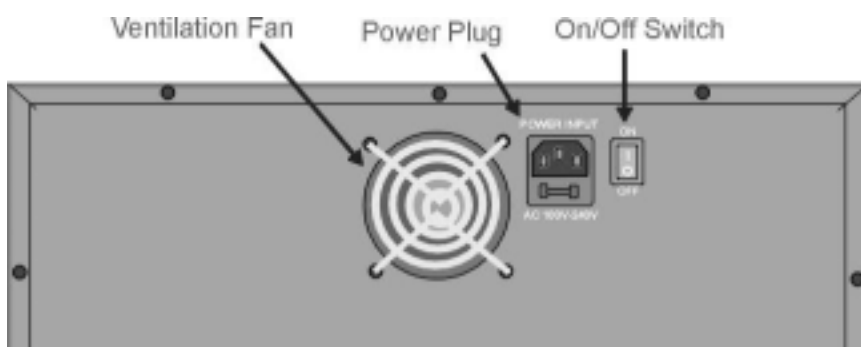
Figure 2-3. The Rear Panel of the Multi-Converter Chassis

Chapter 3. Modular Converters

This Chapter introduces optional modular converters and gives information on how to install optional modular converters into the Multi-Converter Chassis. This chapter contains following items:

- Modular Fiber/T Converters
- Modular Fast Fiber Converters
- Modular Gigabit Converters
- Installing Optional Modular Converters

Modular Fiber/T Converter is a cost-effective solution for the conversion between 10BaseT and 10BaseFL Ethernet network. On the other hand, Modular Fast Fiber Converter is a cost-effective solution to convert between 10/100Base-TX and 100 Base-FX cabling.

Modular Fiber/T Converters

The Fiber / T Converter will allow you to extend the cabling distance of your 10BaseT network to a full 2 kilometers or 10 Kilometers for single-mode fiber. This converter provides one ST connection for your fiber optic cable and two RJ-45 ports for your 10BaseT cable connection.
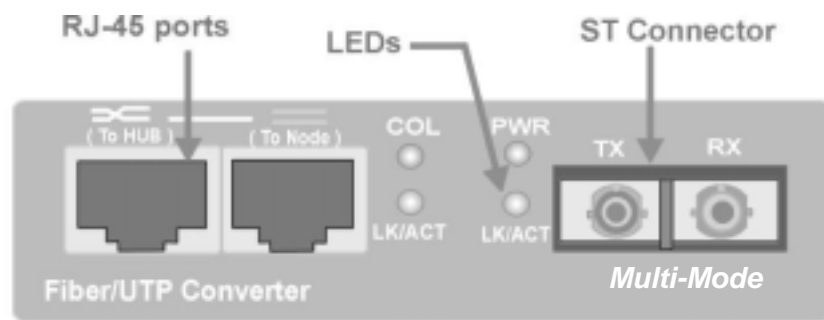

Figure 3-1. The Front Panel of Modular Fiber/T Converter

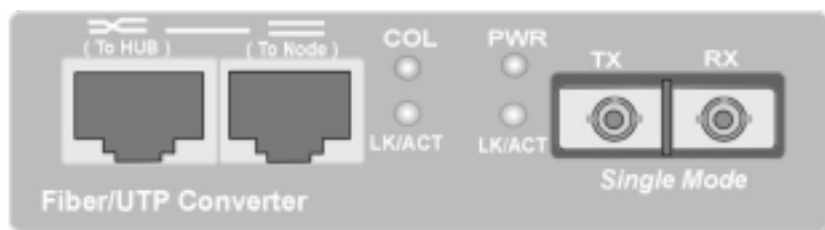### Modular Fiber/T Converter (Single-Mode)

Figure 3-2. The Front Panel of Modular Fiber/T Converter (Single-mode)

Features

- Conforms to IEEE 802.3 10Base-T, 10Base-FL standards
- One RJ-45 port, one uplink port, and one ST connector
- Converts UTP cabling to fiber-optic FL cabling
- 4 Diagnostic LEDs for Power, COL, UTP LK/ACT, Fiber LK/ACT statuses
- External DC power adapter
- Be used stand-alone or mounted in Converter Chassis
- Fiber connectivity up to 2Km (multi-mode) or 10Km (Single-mode)

Physical Dimensions: 119mmX 85mmX 26mm

LEDs

There are 4 diagnostic LEDs located on the Front panel of Modular Fiber/T Converter. They provide real-time information of system and optional status. The indicator includes Power, UTP LK/ACT, Fiber LK/ACT, and COL. The following table provides description of the LED status and meaning.

LED	Status	Meaning
Power	Green	Power on
LK/ACT (UTP)	Green	The unit is receiving link pulse from UTP devices.
	Blinks	The unit is transmitting packets from UTP devices.
	Off	No device attached

LK/ACT (Fiber)	Green	The unit is receiving link pulse from FL devices.
	Blinks	The unit is transmitting packets from FL devices.
	Off	No device attached
COL	Green Blinks	A Collision occurs on the port.
	Off	No Collision or unit not used

Ports

■ 10Base FL(ST) Fiber Port:

[**TX**] and [**RX**] Fiber Port: These ports are for 10 Base FL(ST) connection. (The abbreviation TX means transmitter; RX means receiver.)

■ RJ-45 Port:

[**To Node**] Port: This port is for 10Base-T workstation connection.

[**To Hub**] Port: This port is for 10Base-T Hub or Switch hub connection. It is the same port with [To Node] port, but the pin assignment of this port has been designed to contain crossovers. That is to say, you can connect this port to hub or switch hub without a crossover cable.

Note: The Ports [**To Node**] and [**To Hub**], you can only select one of the two ports to use at a time. Do not attach both ports to network connection simultaneously.

Rear Panel

The rear panel contains a power socket. This power socket accepts DC 5V voltage and minimum 2A supplied current.

Modular Fast Fiber Converter

The Modular Fast Fiber Converter will allow you to extend the cabling distance of your 100BaseTX network to a full 2 kilometers or 60 Kilo-

meters for single- mode fiber. The Fast Fiber Converter gives you the option to choose from the most popular fiber cabling connectors: ST, SC, MT-RJ, VF-45. The Modular Fast Fiber Converters provides you with one Fiber connector for your fiber optic cable and two RJ-45 ports for your 100BaseTX copper cable connection. There are 2 DIP-switches to set the operation mode for UTP, Fiber ports.
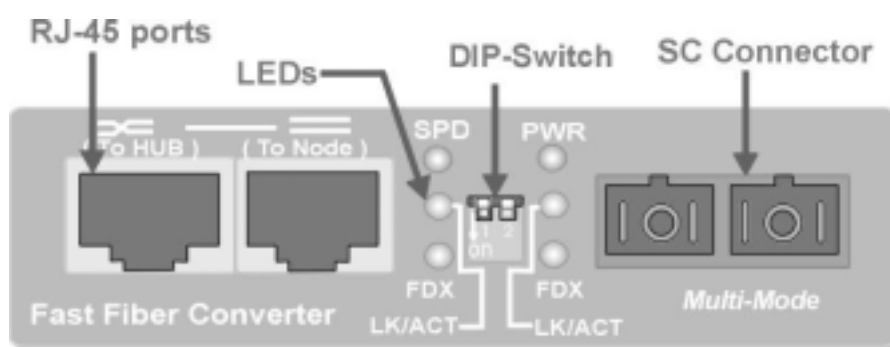
Modular Fast Fiber Converter (SC)

Figure 3-3. The Front Panel of Modular Fast Fiber Converter (SC)
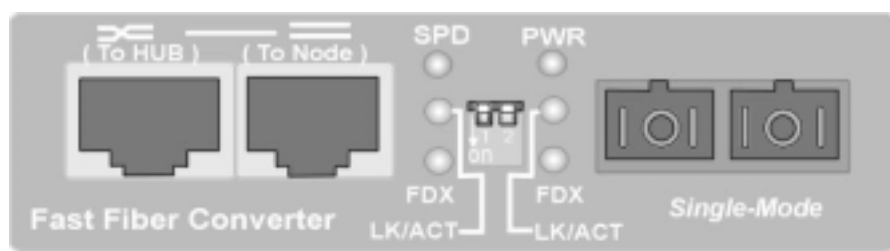
Modular Fast Fiber Converter (SC Single-mode)

Figure 3-4. The Front Panel of Modular Fast Fiber Converter (SC Single-mode)
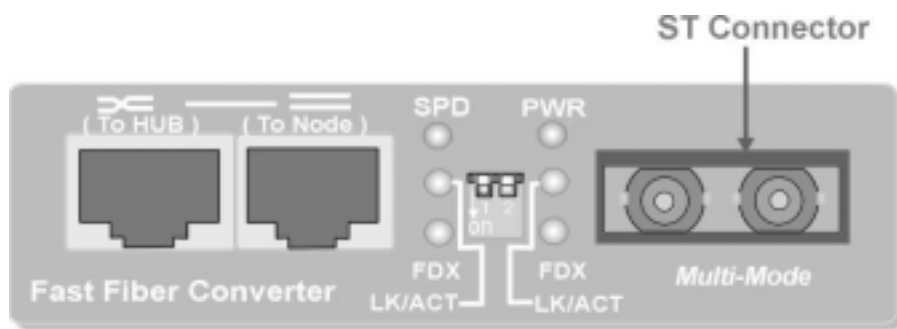
Modular Fast Fiber Converter (ST)

Figure 3-5. The Front Panel of Modular Fast Fiber Converter (ST)

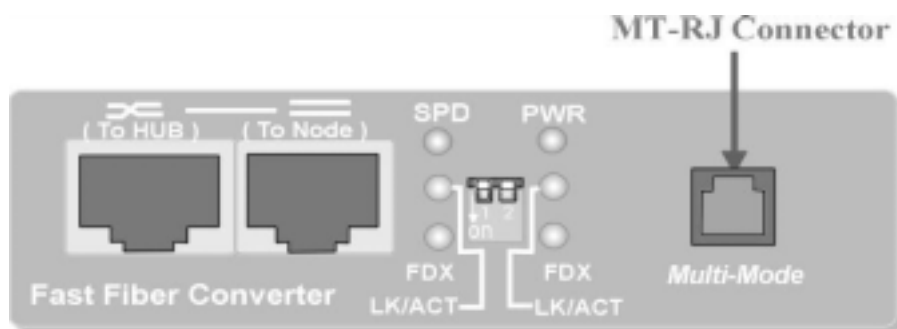### Modular Fast Fiber Converter (MT-RJ)

Figure 3-6. The Front Panel of Modular Fast Fiber Converter (MT-RJ)

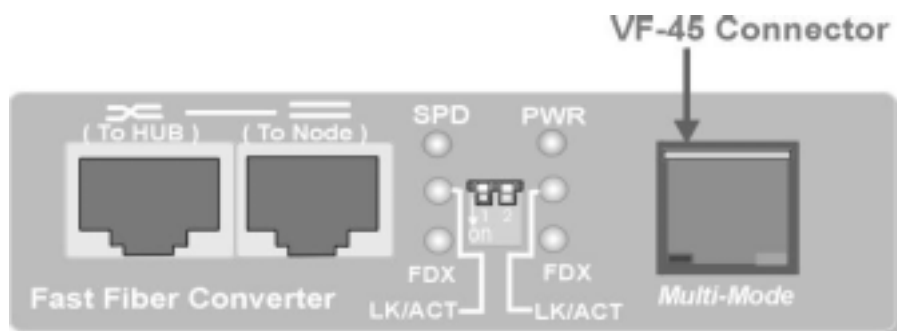### Modular Fast Fiber Converter (VF-45)

Figure 3-7. The Front Panel of Modular Fast Fiber Converter (VF-45)

Features

- Conforms to IEEE 802.3 10Base-T, IEEE802.3u 100Base-TX/FX standards
- One RJ-45 port, one uplink port, and one ST/SC/MT-RJ/VF-45 connector
- Converts UTP cabling to fiber-optic FX cabling
- 2 DIP-switch to set the operation mode for UTP, Fiber Port
- Auto-negotiation selects operation mode for UTP Port
- 6 Diagnostic LEDs for Power, Speed, UTP LK/ACT, FDX, Fiber LK/ACT, FDX statuses
- External DC power adapter
- Be used stand-alone or mounted in Converter Chassis
- Fiber connectivity up to 2Km (multi-mode) or 60Km (Single-mode)

Physical Dimensions: 119mmX 85mmX 26mm

LEDs

There are 6 diagnostic LEDs located on the Front panel of Modular Fast Fiber Converter. They provide real-time information of system and optional status. The indicator includes Power, Speed, UTP LK/ACT, FDX, Fiber LK/ACT, and FDX. The following table provides description of the LED status and meaning.

LED	Status	Meaning
PWR	Green	Power on
SPD	Green	The UTP port is operating in 100Mbps mode.
	Off	The UTP port is operating in 10Mbps mode or no device attached
LK/ACT (UTP)	Green	The unit is linking with it's link partner.
	Blinks	The unit is transmitting or receiving packets from UTP devices.
	Off	No device attached
LK/ACT	Green	The unit is linking with it's link partner.

(Fiber)	Blinks	The unit is transmitting or receiving packets from FX devices.
	Off	No device attached
FDX (UTP)	Orange	The UTP port is operating in full-duplex mode
	Off	Half-duplex mode or no device attached
FDX (Fiber)	Orange	The fiber port is operating in full-duplex mode
	Off	Half-duplex mode or no device attached

Ports

■ **RJ-45 Port:**

[**To Node**] Port: This port is for 10/100 Base-TX workstation connection.

[**To Hub**] Port: This port is for 10/100 Base-TX Hub or Switch hub connection. It is the same port with [To Node] port, but the pin assignment of this port has been designed to contain crossovers. That is to say, you can connect this port to hub or switch hub without a crossover cable.

Note: The Ports [**To Node**] and [**To Hub**], you can only select one of the two ports to use at a time. Do not attach both ports to network connection simultaneously.
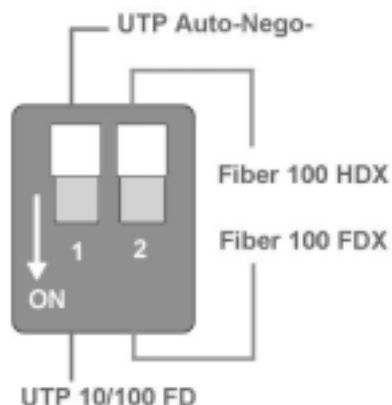
■ **Fiber Port:**

This port is for 100 Base-FX connection. We provide five different style of fiber connectors (**SC, SC Single-mode, ST, MT-RJ, VF-45**) to meet your requirement.

DIP-Switch

The configuration switch is used to set line speed and operation mode for UTP and fiber ports.

Figure 3-8. The DIP-Switch
　　　　　　　　Configuration

a. UTP Auto-negotiation
   Setting the DIP-switch at this position, the converter can automatically configure UTP port for 10M, 100M, full-duplex or half-duplex operation.
b. Full-duplex
   Setting the DIP-switch at this position, the converter can force UTP port in 10/100M full-duplex operation mode.
c. Fiber half-duplex
   Setting the DIP-switch at this position, the fiber port will be configured in 100M half-duplex mode.
d. Fiber full-duplex
   Setting the DIP-switch at this position, the fiber port will be configured in 100M full-duplex mode.

Note: Please don't change the DIP-switch setting when UTP or fiber port is transmitting or receiving data. It may cause some data error.

Rear Panel

The rear panel contains a power socket. This power socket accepts DC 5V voltage and minimum 2A supplied current.

Modular Gigabit Converters

The Modular Gigabit Converter will allow you to extend the cabling distance of your 1000Base-T network to a full 500m (1000Base-SX) or 10 Kilometers (1000Base-LX). The Gigabit Converter gives you the option to choose from the most popular fiber cabling connectors: 1000Base-SX and 1000Base-LX. The Modular Gigabit Converters provide you with one fiber connector for your fiber optic cable and one auto MDI/MDI-X RJ-45 ports for your 1000Base-T copper cable connection.
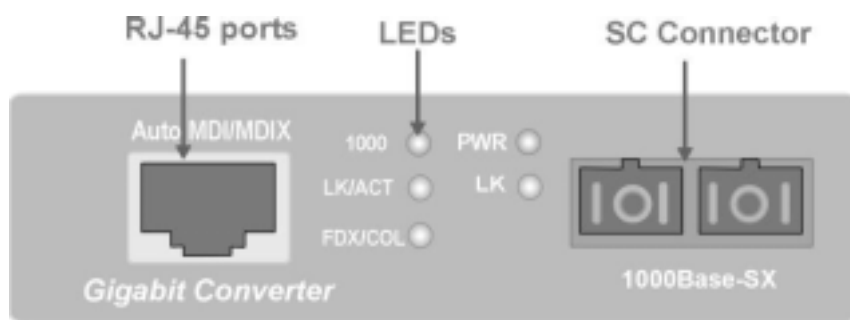
Modular Gigabit Converter (1000Base-SX)

Figure 3-9.   The Front Panel of Modular Gigabit Converter (1000Base-SX)

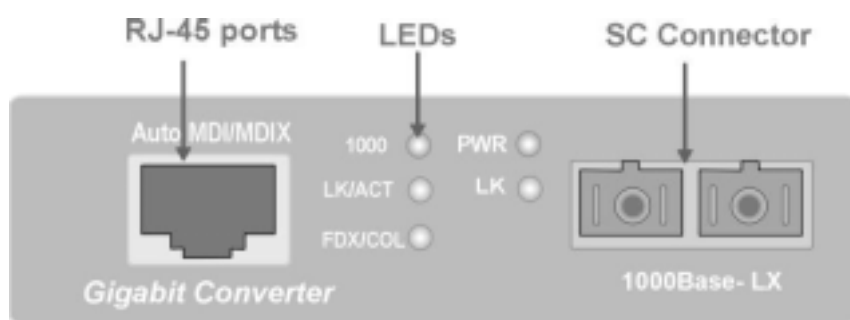### Modular Gigabit Converter (1000Base-LX)

Figure 3-10.   The Front Panel of Modular Gigabit Converter (1000Base-LX)

Features

- Conforms to IEEE 802.3ab 1000Base-T, IEEE802.3z Gigabit Ethernet standards
- One Auto MDI/MDI-X RJ-45 port
- Converts UTP cabling to fiber-optic cabling
- Auto-negotiation selects operation mode for UTP Port
- 5 Diagnostic LEDs for Power, 1000Mbps, UTP LK/ACT, FDX/COL, Fiber LK statuses
- External DC power adapter
- Be used stand-alone or mounted in Converter Chassis
- Fiber connectivity up to 500m (1000Base-SX) or 10Km (1000Base-LX)

LEDs

There are 5 diagnostic LEDs located on the Front panel of Modular Gigabit Converter. They provide real-time information of system and optional status. The indicator includes Power, 1000Mbps, UTP LK/ACT, UTP FDX/COL, Fiber LK. The following table provides description of the LED status and meaning.

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

	Off	No device attached

Ports

■ **RJ-45 Port:**

This port is for 1000Base-T device connection. It can automatically detect MDI or MDI-X mode. That is to say, you can use non-crossover or crossover cable.

■ **Fiber Port:**

This port is for 1000Base-SX or 1000Base-LX connection. This port doesn't support auto-negotiation function. You must force the link partner in full-duplex mode.

Rear Panel

The rear panel contains a power socket. This power socket accepts DC 5V voltage and minimum 2A supplied current.

Installing Optional Modular Converters

Installing Modular Converters into Chassis

You can follow the steps to install modular converters:

a. Remove the blank bracket by rotating thumbscrew counterclockwise. Put the blank bracket aside, but don't discard blanket bracket.

b. Open the rackmount ear kit. The kit contains two rackmount ear (with thumbscrew) and four screws.

c. Attach rackmount ear on both sides of the modular converter by using a screwdriver to secure the rackmount ears. (See Figure 3-11)

Figure 3-11. Attach rackmount ears on both sides of the modular converter

d. Install the modular converter by inserting it into the guides and sliding it in until it stops. Press it firmly until the power plug in the chassis plugs into the modular converter receptacle. Slide the modular converter in smoothly. (See Figure 3-12)

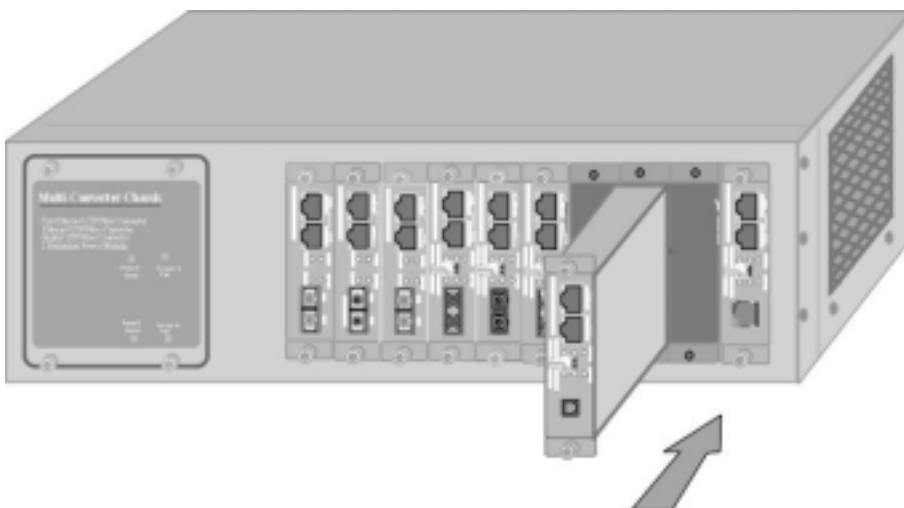e. Gently push the thumbscrews in and turn clockwise to tighten. Do not over tighten the thumbscrews.

Figure 3-12. Installing Modular Converters into Chassis Slot

Chapter 4. Rack-Mount Installation

This Chapter provides the installation procedure of Multi-Converter Chassis:

Hardware Installation

The Multi-Converter Chassis is suitable for use in an office environment where it can be rack-mounted in standard EIA 19-inch racks or standalone.

Desktop Application

1. Set the Multi-Converter Chassis on a sufficiently large flat space with a power outlet nearby.
2. Apply the rubber foot pads to each corner on the bottom of the Chassis. These pads cushion the switch against shock/vibration.
3. Connect the power cord. The power supply is self-adjusting for AC input power between 110 and 220 Volts.

Note: Air vents must not be blocked and must have free access to the room ambient air for cooling.

Rack Mounting

To stack Multi-Converter Chassis in a standard 19-inch EIA rack, use the supplied mounting kit. This kit contains 2 side-mounting brackets, 10 bracket screws, and 4 larger rack-mount screws.

Perform the following steps to rack mount the Chassis:

1. Position one bracket to align with the holes on one side of the switch and secure it with the smaller bracket screws. Then attach the remaining bracket to the other side of the switch.

Figure 4-1: Attaching Mounting Brackets

2. After attached both mounting brackets, position the switch in the rack by lining up the holes in the brackets with the appropriate holes on the rack. Secure the switch to the rack with a screwdriver and the supplied rack-mount screws.
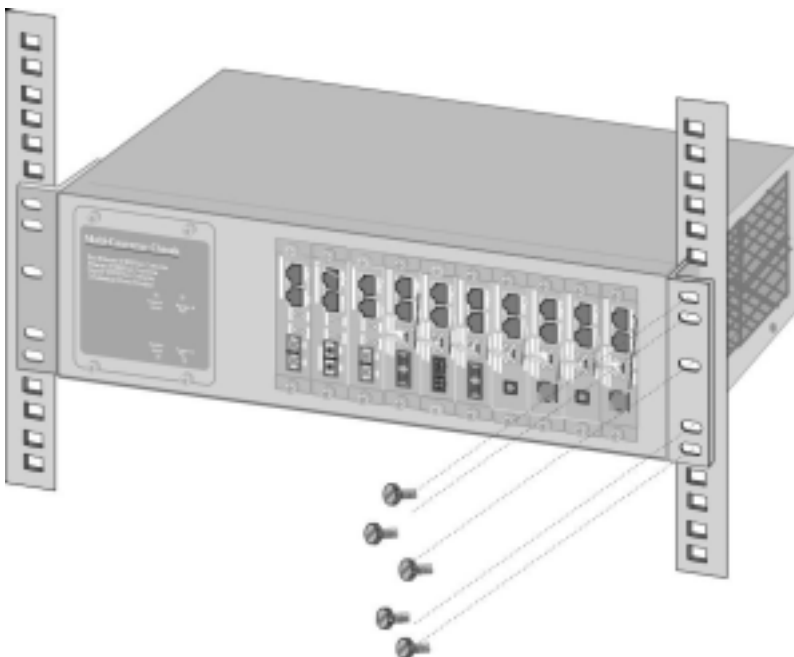

Figure 4-2: Rack Mount the Chassis

Note: For proper ventilation, allow about 6 inches of clearance on all sides of the Chassis. This is especially important for enclosed rack installations.

Cpapter 5. Connecting Your Network

This chapter provides one sample of network connectivity in which the Multi-Converter Chassis is used:

Network Connectivity

In the following network connectivity example, Switches, hubs, and PCs have been interconnected with the Multi-Converter Chassis.
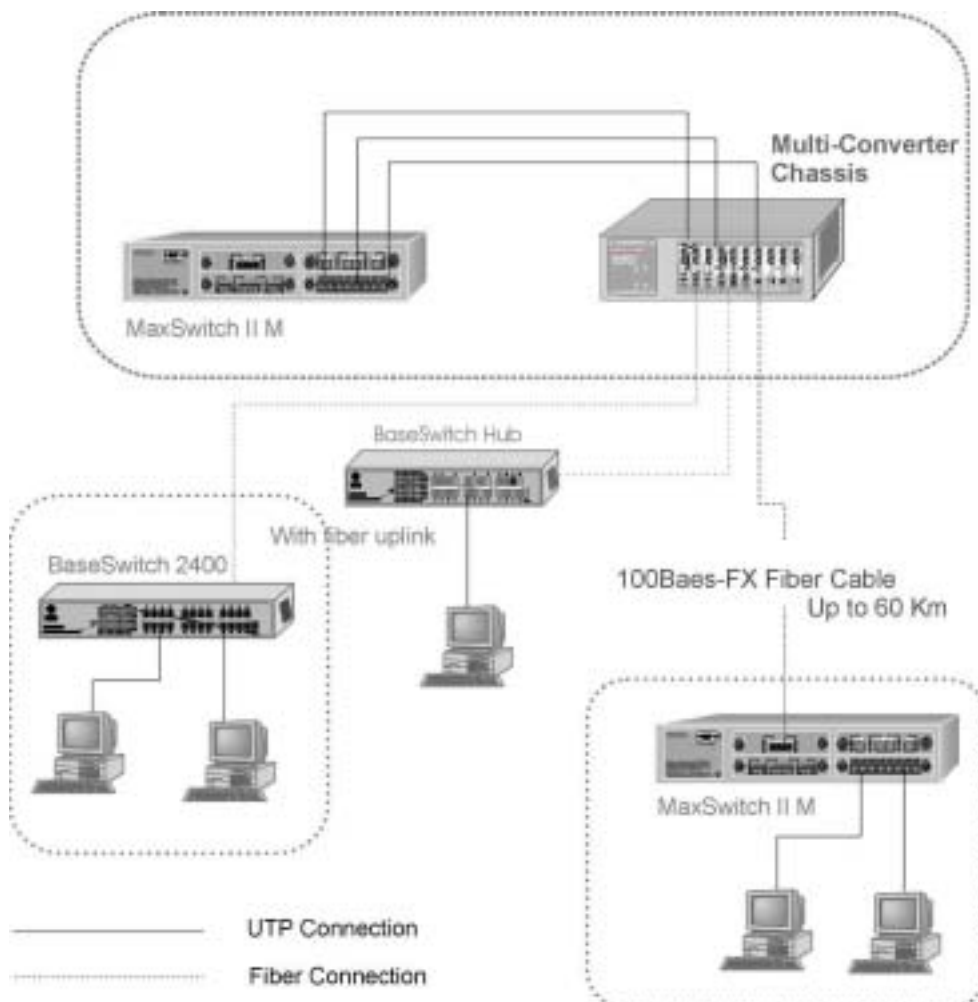

Figure 5-1. The Example of Multi-Converter Chassis Application

In the network connectivity, we divided the connectivity into three groups. The top group may be in MIS department, and the below left one, for instance, can be R&D department. The below right group, for instance, can be QA department.   For example, the QA department is far from MIS department. The Modular Fast Fiber Converters in Multi-Converter Chassis provide fiber connectivity up to 2Km (multi-mode) and 60Km (single-mode).

Technical Specification

- Supports up to 10 converter modules
- All converter modules are hot-swappable
- Supports 10M, 100M modules
    - 10M: UTP – Fiber (ST)
    - 100M: UTP – Fiber (ST, SC, VF-45, MT-RJ)
    - 1000M: UTP – Fiber (SX, LX)
- Dimensions:
    - Multi-Converter Chassis - 440mm x 266mm x 133 mm (3U, 19")
    - Converter Module - 119mm x 85mm x 26mm
- Environment:
    - Operation Temperature – 0ºC to 45ºC (32ºF to 113ºF)
    - Operational Humidity – 10% to 90% (Non-condensing)
- Redundant Hot-Swap Power Supply: 90W x 2
- EMI: FCC Class A, CE Mark
- Safety: CUL, TUV