

**10Base-T
to
10Base-FL Converter
(Multi-mode & Single Mode)**



User's Manual
NWT-707

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FCC WARNING

This equipment has been tested and found to comply with the limits for class A device, pursuant to part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial 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 communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user's own expense.



CE

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Take special note to read and understand all content given in the warning boxes



Warning

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1 Introduction

About This Guide

Welcome

Thank you for choosing the 10Base-T to 10Base-FL Media Converter. This device integrates Ethernet copper and fiber segments in a highly flexible package.

Purpose

This guide discusses how to install and configure your 10Base-T to 10Base-FL Media Converter.

Terms/Usage

In this guide, the term “Converter” (first letter upper case) refers to your 10Base-T to 10Base-FL Media Converter, and “converter” (first letter lower case) refers to other converters.

Features

- Complies with 802.3 10Base-T/FL standard
- MDI/MDI-X push button selection for RJ-45 port connection
- Support ST or SC fiber connector
- Extend fiber distance up to 12km with single Mode fiber
- Compatible with other 10Base-T/FL and 10/100 devices
- Status LEDs for activity & link to easily monitor network activity
- External power supply

Specifications

Standard:	IEEE 802.3u
Connector:	1 RJ-45, 1 ST for Multi-mode or SC for Single Mode
Max.	
Distance:	Twisted Pair: 100m (330ft) Multi-mode: 2km (6600feet) Single Mode: 12km (39600feet)
Unit LEDs:	Power - illuminated for normal operation
Port LEDs:	Link - illuminated when connectors are attached Receive - flashing or illuminated when data packets are being received
Power:	External power supply, 12V DC at 0.8A
Temperature:	Operating : 0 to 70° Storage: -20 to 70°
Humidity:	Operating : 10% to 90%RH Storage : 5% to 90%RH
Emissions:	FCC Part 15 of Class A & CE Approved
Dimensions:	109.2 x 73.8 x 23.4 mm (LxWxH)
Switch:	Push button switch: for TP MDI/MDI-X Connection (Go to Location)

Package Contents

The 10Base-T to 10Base-FL Converter package should include:

- One converter
- One AC adapter (for external power supply)
- Four pieces self-adhesive pads
- One user's manual

Go to [Installing Your Converter](#)

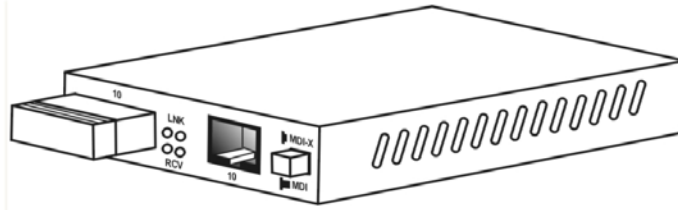
2 Hardware Description

Product Overview

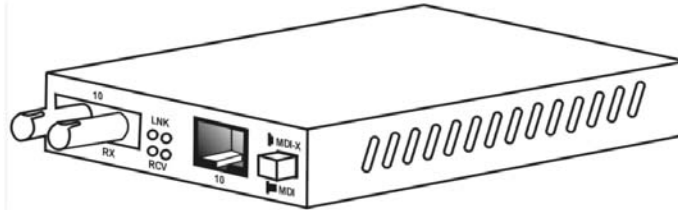
The Converter is primarily designed for network or data installations that require the migration of cable media between conventional coppers based wiring to Fiber based installations. These Converters have been specifically designed to support both a RJ-45 jack and a ST or SC fiber optic connector. This allows it to connect 10Base-T network to the 10Base-FL (fiber) networks.

In addition, this Converter features an MDI/MDI-X crossover "push button" switch for direct connection to a workstation, switch or hub. This allows the network manager freedom to configure between crossover and straight through when establishing a connection between RJ-45 ports. This Converter can create potential distances of up to 12km (39600feet) with single mode fiber between 2 networking nodes.

Front Panel View with SC and RJ-45 Connectors



Front Panel View with ST and RJ-45 Connectors



3 Installation

Installing Your Converter

In this chapter, we will take a look at how to install converters within its operating environment. First, it is important to unpack the Converter and ensure that all the components listed in [Package Contents](#) are present.

- Location
- MDI/MDI-X Connection
- Installing Converter
- Desktop Installation
- Powering On Unit
- Connecting Fiber Cable
- Connecting Copper Cable

Location

The location selected for installing the Converter may greatly affect its performance. When selecting a site, we recommend considering the following rules:

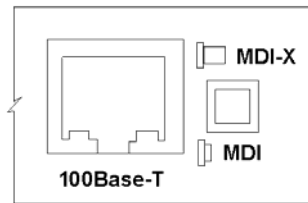
1. Install the Converter in a fairly cool and dry place. See *Technical Specifications* for the acceptable temperature and humidity operating ranges.
2. Install the Converter in a location free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
3. Leave at least 10cm of space at the front and rear of the unit for ventilation.
4. Affix the provided rubber pads to the bottom of the Converter for grip, and to protect the case from scratching.

MDI/MDI-X Connection

The MDI / MDI-X function alleviates the worry of cable type configuration used for connecting the Converter with a 10Base-T device. Simply follow the chart below when connecting the Converter, and use the push button to select MDI or MDI-X accordingly.

Device	Cable Configuration	Selection
Hub or Switch	Straight Through	Select MDI
Hub or Switch	Crossover	Select MDI-X
DTE (NIC)	Straight Through	Select MDI

Crossover Selection Table



Location of Crossover Switch

Install the converter

This Converter utilizes ports with fiber and copper port connectors functioning under the Fast Ethernet protocol.

10BASE-T Port

The 10BASE-T port supports network speed of 10Mbps, and is designed to operate in half-duplex transfer mode only. This port also offers MDI/MDI-X crossover selection to gives true "plug and play" capability. Just plug-in the network cable to the port and adjust the push-button according the chart above. The RJ-45 connector is suitable for UTP cable Category 3, 4, 5 or better.

10BASE-FL Port


The 10BASE-FL port adds a fiber Ethernet link to your network device. Compliant with IEEE 802.3, this port can transmit data at 10Mbps in half-duplex mode across distances of up to 2km through multi-mode fiber-optic cable. The fiber port has a choice of fiber connector types: ST and SC.

Desktop Installation

Follow the instructions listed below to install the Converter onto a desktop location.

1. Locate the Converter in a clean, flat and safe position that has easy access to AC power.
2. Affix the four (4) self-adhesive rubber pads to the underside of the Converter.
3. Apply AC power to the Converter. (The green PWR LED on the front panel should light).
4. Connect cables from the network partner devices to the ports on the front panel. (The green LNK LED on the front panel associated with the port should light).

This Converter can also be mounted on a vertical surface. Simply use the underside of the unit as a template to measure and mark out the position of the holes on to the surface where the unit is to be installed. Then use the two screws provided to mount the converter firmly in place.

 **Warning** Please exercise caution when using power tools. Also, install this unit away from damp or wet locations, or in close proximity to very hot surfaces. These types of environments can have a detrimental effect on the converter and cables. An ideal location is a lightly cooled place such as a typical equipment room.

Powering On Unit

The Converter uses external power supply 12V DC @ 0.8A 50~60 Hz.

1. Insert the power cable plug directly into the receptacle located at the back of the device.
2. Plug the power adapter into an available socket.
3. Check the front-panel LEDs as the device is powered on to verify that the Power LED is lit. If not, check that the power cable is correctly and securely plugged in.

Note: For International use, you may need to change the AC power adapter cord. You must use a power cord set that has been approved for the receptacle type and electrical current in your country.

Connecting Fiber Cable

When connecting fiber cable to a 10BASE-FL port on the Converter, be sure the correct type - ST or SC - connector is used. Follow the steps below to properly connect fiber cable:

1. Remove and keep the fiber port's rubber cover. When not connected to a fiber cable, the rubber cover should be replaced to protect the optics.
2. Check that the fiber terminators are clean. You can clean the cable plugs by wiping them gently with a clean tissue or cotton ball moistened with a little ethanol. Dirty fiber terminators on fiber optic cables will impair the quality of the light transmitted through the cable and lead to degraded performance on the port.
3. Connect one end of the cable to the ST/SC port on the Converter and the other end to the ST/SC port on the other device.
4. Check the corresponding port LED on the Converter to be sure that the connection is valid. (Refer to the LED chart in next section)

Note: When inserting the cable, be sure the tab on the plug clicks into position to ensure that it is properly seated.



Warning Because invisible laser radiation may be emitted from the aperture of the fiber port when no cable is connected, avoid exposure to laser radiation and do not stare into the open apertures.

Connecting Copper Cable

1. Insert one end of Category 5 twisted pair cable into an available RJ-45 port on the Converter and the other end into the port of the network node.
2. Check the corresponding port LED on the Converter to make sure that the connection is valid. (Refer to LED chart in next section)

4 LED Indicators

LED Table

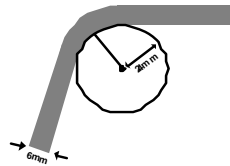
This Converter has LED indicators located at the front of the device. The LEDs have been designed to give easy at-a-glance network status, and provides 'real-time' connectivity information. Please see below for an interpretation of their functions:

LED Indicators		
LED	Condition	Status
PWR	On (Green)	Converter is receiving power
	Off	Power off or failure
LNK	On (Green)	Illuminated when connectors are attached
	Flashing (Green)	Data traffic passing through port
	Off	No link established
RCV	On (Amber)	Receiving data packets
	Flashing	Receiving data packets at a slower rate
	Off	No data packets received

Appendix A

Cables

The following are some recommendations as to what you should and should not do when installing cables. Remember - cables are the deciding factor in network performance.



Try to maintain a bend radius of (min.) 4x the diameter of the cable for UTP and 100x for fiber.



Try not to allow the cable to twist too much - this creates a strain on the internal cables.



Place cable ties at regular intervals - do not over tighten cable ties - try to avoid using with fiber.



Do not stretch the cable especially on corners, in vertical cable trays and when spanning long distances.

Appendix B

About RJ-45 Cables

When connecting your network devices, use standard Category 3 eight-way cables for 10Base-T configurations and Category 5 cable for 100Base-TX. The pin assignments are as follows:

Pin	1	TD+	Pair	2	White/Orange
Pin	2	TD-	Pair	2	Orange/White
Pin	3	RX+	Pair	3	White/Green
Pin	4	N/A	Pair	1	Blue/White
Pin	5	N/A	Pair	1	White/Blue
Pin	6	RX-	Pair	3	Green/White
Pin	7	N/A	Pair	4	Brown/White
Pin	8	N/A	Pair	4	Brown/White

Application	Cable Type	Application
Converter to Converter or Network Adapter	Straight-through Cable	Converter End Hub End
Converter to Switch	Cross-Over Cable	Converter End #1 Converter End #2

Appendix C

Mini Converter Chassis

The Chassis was developed to accommodate just one media converter. The Chassis provides protection for converter units and an option of AC or DC power supplies. Now, network designers can plan their Ethernet, Fast Ethernet, ATM, or Gigabit networks without having to worry about the power source. Furthermore, its unique sizes allows it to be installed in locations where space is limited.

Features

- Simple and easy to install
- Adds fiber connectivity to otherwise copper based networks
- Supports 10/100/1000Base, copper, fiber, single/multi-mode converters with, RJ-45, ST, SC, MT-RJ, VF-45, LC, WDM connectors
- Accommodates one media converter
- Suitable for all size of networks in all locations
- Provides internal AC or DC switching power supply
- Made from high quality durable steel
- Optional external redundant power adapter

Affixing Brackets

We have supplied 2 special brackets that easily attaches to the Converter. This allows for the secure placement of the converter into the Chassis. It also seals off the front of Chassis and allows it to function correctly.

Step 1 Using a Phillips screwdriver, remove two screws from the side panels on the converter.



Step 2 Place the converter and brackets on a flat horizontal surface as illustrated above. Secure the brackets by replacing the screws.

Place

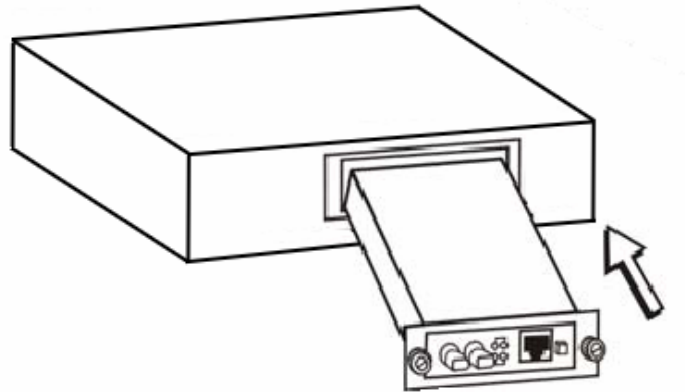


Ensure that the rails are flush-mounted with the underside of the converter. The converter is now ready for loading into the Chassis.

Installing the Converter

Once the Converter has been attached to the bracket, it can be installed into the Chassis. Special care must be taken to ensure the correct mating of the power connector. Align the Converter so that it fits between the upper and lower guide rails.

⚡ Warning Always ensure that the converter power socket is positioned at the base of the Chassis. Never force the Converter into the Chassis - check power socket position and alignment.



Rear view of Chassis and specifications



Rear View of Chassis with AC Power Supply

Power: 100 - 240V AC (Optional 12V Adapter)

Dimensions: 109 x 174 x 44.3 mm (L x W x H)



Rear View of Chassis with DC Power Supply

Power: -48V DC (Optional 12V Adapter)

Dimensions: 109 x 174 x 44.3 mm (L x W x H)

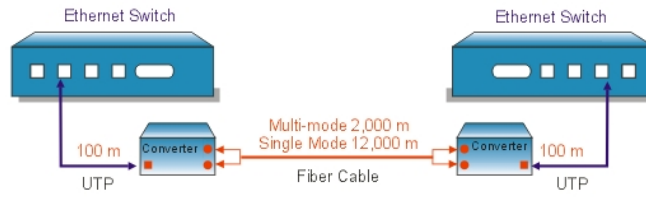
Appendix D

Application Diagram

To effectively expanding an Ethernet network, position two converters back-to-back as illustrated.

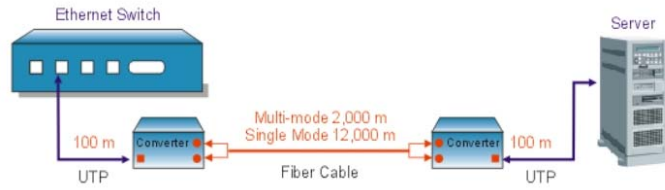
Application Diagram I

In the figure below, the Converter is functioning as a high-speed bridge between switches creating increased capacity for each user (node) on the local area network. It is providing a 10Mbps full duplex link to a variety of Ethernet network devices within a LAN.



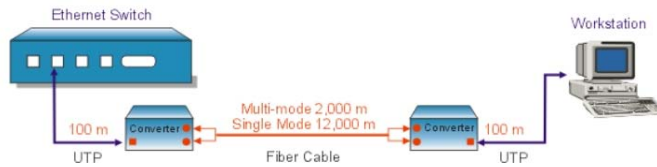
Application Diagram II

In the figure below, the Converter is functioning as a server aggregation for an enterprise or LAN configuration. It is providing a 10Mbps full duplex link to a workgroups of 10/100 switches located on separate floors within a single building.



Application Diagram III

In the figure below, the Converter is functioning as a high-speed dedicated link within a campus network configuration. It is providing a 10Mbps full duplex link to a remote network node.



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