

## USER'S GUIDE

### E-100BTX-FX-N-01

### E-100BTX-FX-NLP-01

#### PCI Media Converter

- *Ethernet*
- *Copper to Fiber*
- *100Base-TX to 100Base-FX*

Transition Networks E-100BTX-FX-N-01 and E-100BTX-FX-NLP-01 series media converters connect 100Base-TX twisted-pair copper cables to 100Base-FX fiber optic cables and are PCI (Peripheral Component Interconnect)

powered. These converters are designed to install directly inside a PC workstation or file server and mount on any slot on a standard PCI. No additional power supply is needed since the power is drawn directly from the PCI slot. Two LEDs allow for network monitoring.

The E-100BTX-FX-N-01 series media converter is 4.8 in. (121 mm) wide while the E-100BTX-FX-NLP-01 series media converter is 3.2 in (80 mm) wide.

Part Number	Port One - Copper 100Base-TX	Port Two - Duplex Fiber-Optic 100Base-FX
<b>E-100BTX-FX-N-01</b>	<i>RJ-45</i>	<i>ST, 1300 nm multimode</i>
<b>E-100BTX-FX-NLP-01</b>	<i>100 m (328 ft)*</i>	<i>2 km (1.2 miles)*</i>
<b>E-100BTX-FX-N-01(SC)</b>	<i>RJ-45</i>	<i>SC, 1300 nm multimode</i>
<b>E-100BTX-FX-NLP-01(SC)</b>	<i>100 m (328 ft)*</i>	<i>2 km (1.2 miles)*</i>
<b>E-100BTX-FX-N-01(SM)</b>	<i>RJ-45</i>	<i>SC, 1310 nm single mode</i>
<b>E-100BTX-FX-NLP-01(SM)</b>	<i>100 m (328 ft)*</i>	<i>20 km (12.4 miles)*</i>

\* Typical maximum cable distance. Actual distance is dependent upon the physical characteristics of the network installation.

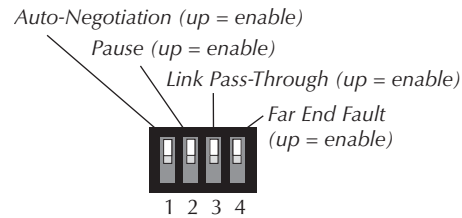
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## Installation

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when setting the 4-position switch. **Failure to observe this caution could result in damage to, and failure of, the media converter.**

### Set the 4-Position Switch

- The 4-position switch is located on the circuit board.
- Use a small flat-blade screwdriver to set the recessed switches.



- Auto-Negotiation**  
up Enable Auto-Negotiation for the copper link (see page 4).  
down Disable Auto-Negotiation for the copper link.
- Pause Control Frame**  
up Enable the pause feature (see page 5).  
down Disable the pause feature.
- Link Pass-Through**  
up Enable Link Pass-Through (see page 4).  
down Disable Link Pass-Through.
- Far-End Fault**  
up Enable Far-End Fault (see page 5).  
down Disable Far-End Fault.

### Install the Slide-in-Module

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when installing the slide-in-module. **Failure to observe this caution could result in damage to, and failure of, the media converter.**

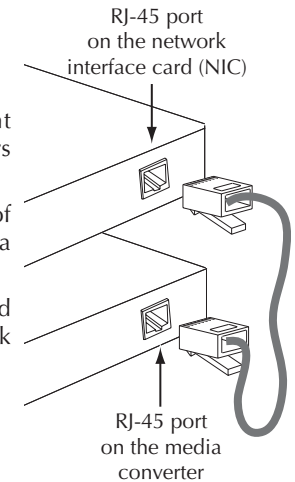
To install the E-100BTX-FX-N-01 or the E-100BTX-FX-NLP-01 media converter slide-in-module:

- Locate an empty installation slot on the PC workstation or file server.
- Remove the screws that secure the cover over the installation slot. Retain the screws.
- Carefully slide the slide-in-module into the installation slot, aligning the module with the installation guides.
- Ensure that the module is firmly seated in the installation slot.
- Use the screws from step 2 to secure the module to the workstation or file server housing.

## Installation -- Continued

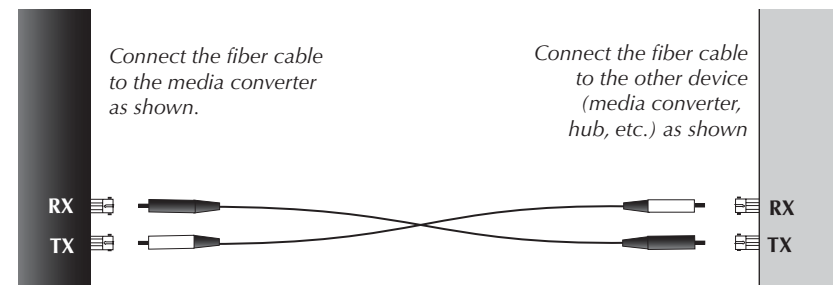
### Install the Copper Cable

- Use the enclosed 100Base-TX compliant copper cables with male, RJ-45 connectors installed at both ends.
- Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the media converter.
- Connect the RJ-45 connector at the other end of the cable to the RJ-45 port on the network interface card (NIC).



### Install the Fiber Cable

- Locate or build 100Base-FX compliant fiber cable with male, two-stranded TX to RX connectors installed at both ends.
- Connect the fiber cables to the media converter as described:
  - Connect the male **TX** cable connector to the female **TX** port.
  - Connect the male **RX** cable connector to the female **RX** port.
- Connect the fiber cables to the other device (another media converter, hub, etc.) as described:
  - Connect the male **TX** cable connector to the female **RX** port.
  - Connect the male **RX** cable connector to the female **TX** port.



### Power the Media Converter

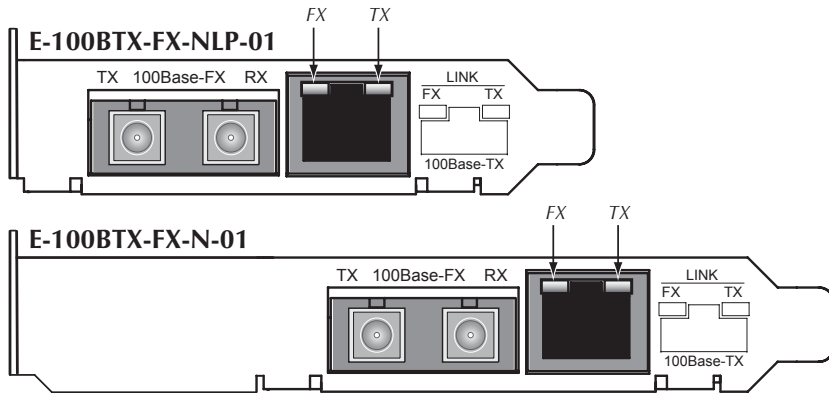
Both the E-100BTX-FX-N-01 and the E-100BTX-FX-NLP-01 media converters are powered by the PCI (Peripheral Component Interconnect) edge connector on the circuit board.

# Operation

## LED Indicators

Use the status LEDs to monitor the media converter operation in the network.

- FX LED** on = The fiber link has been established.
- TX LED** on = The copper link has been established.
- (Both LEDs off = No power to the media converter.)



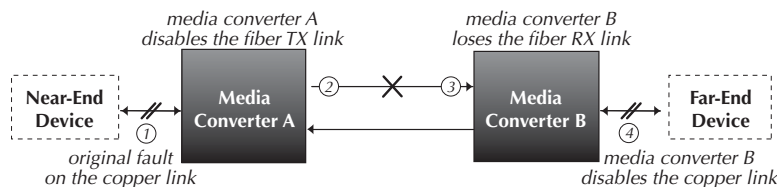
## Product Features

### Auto-Negotiation

The Auto-Negotiation feature allows the media converter to automatically configure itself to achieve the best possible mode of operation over a link. This feature allows quick and easy installation because the optimal link is established automatically. No user intervention is required to determine the best mode of operation.

### Link Pass-Through

The Link Pass-Through feature allows the media converter to monitor both the fiber and copper RX (receive) ports for loss of signal. In the event of a loss of an RX signal (1), the media converter will automatically disable the TX (transmit) signal (2), thus, "passing through" the link loss (3). The far-end device is automatically notified of the link loss (4), which prevents the loss of valuable data unknowingly transmitted over an invalid link.



# Operation -- Continued

## Pause Control Frame

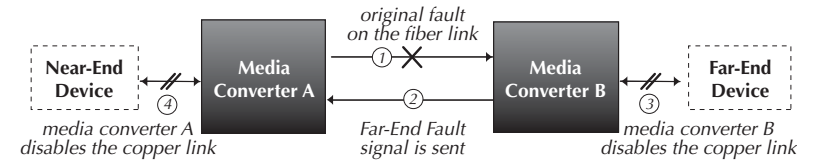
The pause feature is used to temporarily suspend data transmission in order to relieve buffer congestion. If a media converter needs some time to clear network congestion, it will send a pause signal to the media converter at the other end, which will wait a predetermined amount of time before re-transmitting the data. This feature reduces data bottlenecks, allows for a more efficient use of the network devices, and prevents the loss of valuable data.

**NOTE:** Enable the pause feature if it is present on ALL network devices attached to the media converter(s). Otherwise, disable the pause feature.

**NOTE:** Disable the pause feature in networks with E-911, VoIP, or other time-critical applications.

## Far-End Fault

When a fault occurs on an incoming fiber link (1), the media converter transmits a Far-End Fault signal on the outgoing fiber link (2). In addition the Far-End Fault signal also activates the Link Pass-Through feature, which, in turn, disables the link on the copper portion of the network (3) and (4).



# Cable Specifications

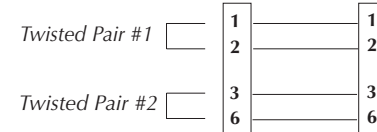
## Copper Cable

### Category 5:

Gauge: 24 to 22 AWG  
Attenuation: 22.0 dB /100m @ 100 MHz

- Straight-through (MDI) twisted-pair cable must be used.
- Shielded (STP) or unshielded (UTP) twisted-pair cable may be used.
- Pins 1&2 and 3&6 are the two active pairs in an Ethernet network .
- RJ-45 Pin-out: Pin 1 = TD+, Pin 2 = TD-, Pin 3 = RD+, Pin 6 = RD-
- Use only dedicated wire pairs for the active pins:  
(e.g., blue/white & white/blue, orange/white & white/orange, etc.)
- Do not use flat or silver satin wire.

### Straight-Through Cable



## Cable Specifications -- Continued

The physical characteristics must meet or exceed IEEE 802.3™ specifications.

### Fiber Cable

Bit Error Rate:	<10 <sup>-9</sup>
Single mode fiber (recommended):	9 μm
Multimode fiber (recommended):	62.5/125 μm
Multimode fiber (optional):	100/140, 85/140, 50/125 μm

#### E-100BTX-FX-N-01, E-100BTX-FX-NLP-01

<b>E-100BTX-FX-N-01(SC), E-100BTX-FX-NLP-01(SC)</b>	1300 nm multimode	
Fiber Optic Transmitter Power:	min: -19.0 dBm	max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm	max: -14.0 dBm
Link Budget:	11.0 dB	

<b>E-100BTX-FX-N-01(SM), E-100BTX-FX-NLP-01(SM)</b>	1310 nm single mode	
Fiber Optic Transmitter Power:	min: -15.0 dBm	max: -8.0 dBm
Fiber Optic Receiver Sensitivity:	min: -31.0 dBm	max: -8.0 dBm
Link Budget:	16.0 dB	

The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

## Technical Specifications

For use with models E-100BTX-FX-N-01 or E-100BTX-FX-NLP-01 or equivalent.

<b>Standards:</b>	IEEE 802.3™	
<b>Data Rate:</b>	100 Mb/s	
<b>Dimensions: (-NLP)</b>	3.154" x 5.280" x 0.932" (80 mm x 134 mm x 24 mm)	
<b>Dimensions: (-N)</b>	4.762" x 5.280" x 0.932" (121 mm x 134 mm x 24 mm)	
<b>Weight:</b>	3 oz. (91g) (approximate)	
<b>Power Consumption:</b>	600 mA @ 5 VDC	
<b>MTBF:</b>	1,034,000 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 4,735,000 hours (Bellcore7 V5.0)	
<b>Environment:</b>	Tmra* 0 to 50°C (32 to 122°F)	Storage Temp: -25 to 85°C (-13 to 185°F)
		Humidity: 5 to 95%, non condensing
		Altitude: 0 to 10,000 feet
<b>Warranty:</b>	Lifetime	

\*Manufacturer's rated ambient temperature. Tmra range for this slide-in-module depends on the physical characteristics and the installation configuration of the file server or PC workstation in which this slide-in-module will be installed.

Product is certified by the manufacturer to comply with DHHS Rule 21/CFR, Subchapter J applicable at the date of manufacture.

**CAUTION:** Visible and invisible laser radiation when open. Do not stare into the beam or view directly with optical instruments.

**CAUTION:** Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

## Troubleshooting

### 1. Are both FX and TX LEDs illuminated?

**NO**

- Confirm that the media converter is properly inserted into the PC workstation or the file server.
- Confirm that the PC workstation or the file server is properly connected to the power source and is turned on.
- Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

**YES**

- Proceed to step 2.

### 2. Is FX LED illuminated?

**NO**

- Check the **fiber cables** for proper connection.
- Verify that the TX and RX cables on the media converter are connected to RX and TX ports, respectively, on the other device.
- Disconnect and reconnect the fiber cable to restart the initialization process.
- Restart the attached device to restart the initialization process.
- Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

**YES**

- Proceed to step 3.



### 3. Is TX LED illuminated?

**NO**

- Check the **twisted-pair copper cables** for proper connection.
- Disconnect and reconnect the copper cable to restart the initialization process.
- Restart the attached device to restart the initialization process.
- Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

**YES**

- Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

		<b>Declaration of Conformity</b>
Name of Mfg:	<b>Transition Networks</b> 6475 City West Parkway, Minneapolis MN 55344 USA	
Model:	<b>E-100BTX-FX-N-01 &amp; E-100BTX-FX-NLP-01 Media Converter</b>	
Part Number:	<b>E-100BTX-FX-N-01, E-100BTX-FX-N-01(SC), E-100BTX-FX-N-01(SM)          E-100BTX-FX-NLP-01, E-100BTX-FX-NLP-01(SC), E-100BTX-FX-NLP-01(SM)</b>	
Regulation:	<b>EMC Directive 89/336/EEC</b>	
Purpose:	To declare that the <b>E-100BTX-FX-N-01</b> and <b>E-100BTX-FX-NLP-01</b> to which this declaration refers is in conformity with the following standards.	
	<b>E-100BTX-FX-N-01(xx):</b> CISPR 22:1997+A1:2000; EN 55022:1998+A1:2000 Class A; FCC Part 15 Subpart B; 21CFR subpart J	
	<b>E-100BTX-FX-N-01(xx):</b> CISPR 22:1997+A1:2000; EN 55022:1998+A1:2000 Class A; EN 55024:1998; FCC Part 15 Subpart B; 21CFR subpart J	
	<i>I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).</i>	
	 Stephen Anderson, Vice-President of Engineering	September 19, 2003 Date

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## Compliance Information

E-100BTX-FX-NLP-01(xx): **CISPR22/EN55022 Class A; CE Mark**

E-100BTX-FX-N-01(xx): **CISPR22/EN55022 Class A + EN55024; CE Mark**

### FCC Regulations

This equipment 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 will be required to correct the interference at the user's own expense.

### Canadian Regulations

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications. Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

### European Regulations

**Warning** 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.

**Achtung!** Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten. In diesem Fall ist der Benutzer für Gegenmaßnahmen verantwortlich.

**Attention!** Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.



**CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.**

**Der Anschluss dieses Gerätes an ein öffentliches Telekommunikationsnetz in den EG-Mitgliedstaaten verstößt gegen die jeweiligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.**

### Technical Support

Technical support is available at [techsupport@transition.com](mailto:techsupport@transition.com)

US and Canada: **1-800-260-1312** (24 hours) International: **00-1-952-941-7600** (24 hours)

Chat live via the Web with Transition Networks Technical Support.

Log onto [www.transition.com](http://www.transition.com) and click the **Transition Now** link.

Transition Networks - 6475 City West Parkway - Minneapolis, MN 55344, USA

telephone: 952-941-7600, toll free: 800-526-9267, fax: 952-941-2322

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