

USER'S GUIDE
E-100BTX-FX-N-02
E-100BTX-FX-NLP-02
PCI Powered Media Converter
 • **Fast Ethernet**
 • **Copper to Fiber**
 • **100Base-TX to 100Base-FX**

Transition Networks E-100BTX-FX-N-02 and E-100BTX-FX-NLP-02 series media converters connect 100Base-TX twisted-pair copper cables to 100Base-FX fiber optic cables. These converters are designed to install directly inside a PC workstation or file server, and insert

into any slot on a standard PCI bus. No additional power supply is needed since the power is drawn directly from the PCI slot. The two LEDs on the RJ-45 port facilitate end-user network monitoring.

Part Number	Port One - Copper 100Base-TX	Port Two - Duplex Fiber Optic 100Base-FX
E-100BTX-FX-N-02	RJ-45	ST, 1300 nm multimode
E-100BTX-FX-NLP-02	100 m (328 ft)*	2 km (1.2 miles)*
E-100BTX-FX-N-02(SC)	RJ-45	SC, 1300 nm multimode
E-100BTX-FX-NLP-02(SC)	100 m (328 ft)*	2 km (1.2 miles)*
E-100BTX-FX-N-02(SM)	RJ-45	SC, 1310 nm single mode
E-100BTX-FX-NLP-02(SM)	100 m (328 ft)*	20 km (12.4 miles)*

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

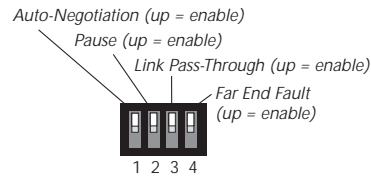
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Installation

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.
down Disable Auto-Negotiation for the copper link.
- Pause Control Frame
up Enable the pause feature.
down Disable the pause feature.
- Link Pass-Through
up Enable Link Pass-Through.
down Disable Link Pass-Through.
- Far-End Fault
up Enable Far-End Fault.
down Disable Far-End Fault.

Install the converter module

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

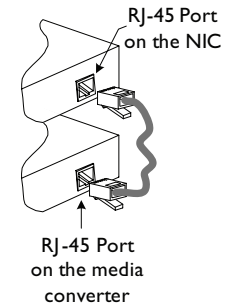
To install the E-100BTX-FX-N-02 or the E-100BTX-FX-NLP-02 media converter module:

- 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 insert the converter 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

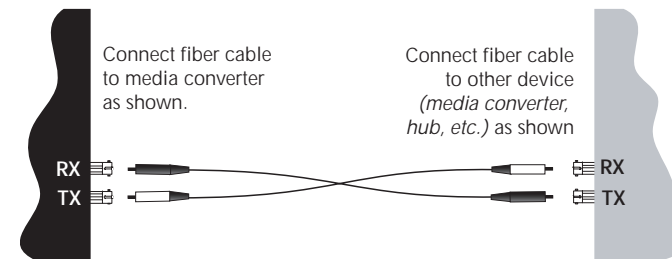
Install the copper cable

- 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 a 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-02 and the E-100BTX-FX-NLP-02 media converters are powered by the PCI (*Peripheral Component Interconnect*) edge connector on the circuit board.

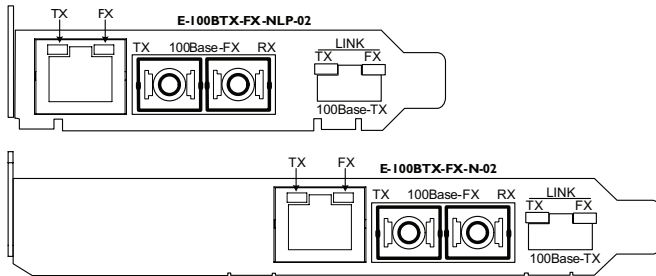
Operation

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.



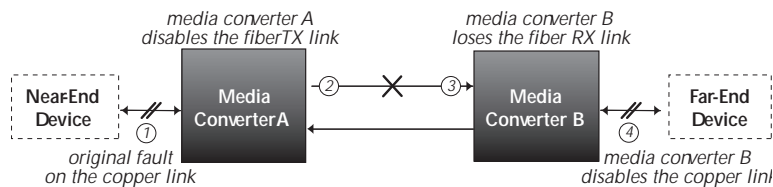
Product features

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

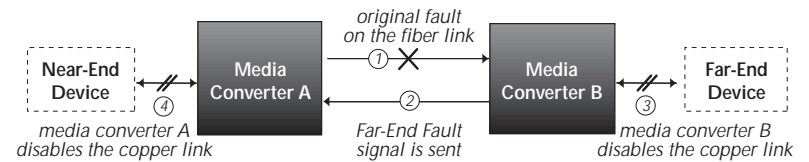
The pause feature is used to temporarily suspend data transmission in order to relieve buffer congestion. If a media converter needs some time to clear network congestion, it will send a pause signal to the media converter at the other end, which will wait a predetermined amount of time before re-transmitting 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).

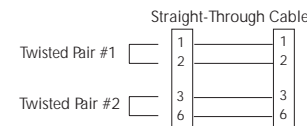


Cable Specifications

Copper cable

Wire: Cat 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.



Cable Specifications — Continued

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

Fiber cable

Bit Error Rate:	<10 ⁻⁹	
Single mode fiber (<i>recommended</i>):	9 μm	
Multimode fiber (<i>recommended</i>):	62.5/125 μm	
Multimode fiber (<i>optional</i>):	100/140, 85/140, 50/125 μm	
E-100BTX-FX-N-02, E-100BTX-FX-NLP-02		
E-100BTX-FX-N-02(SC), E-100BTX-FX-NLP-02(SC)	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	

E-100BTX-FX-N-02(SM), E-100BTX-FX-NLP-02(SM)	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-02 or E-100BTX-FX-NLP-02 or equivalent.

Standards:	IEEE 802.3™	
Data Rate:	100 Mb/s	
Dimensions: (-NLP)	3.154" x 5.280" x 0.932" (80 mm x 134 mm x 24 mm)	
Dimensions: (-N)	4.762" x 5.280" x 0.932" (121 mm x 134 mm x 24 mm)	
Shipping Weight:	3 oz. (91g) (<i>approximate</i>)	
Power Consumption:	600 mA @ 5 VDC	
MTBF:	1,034,000 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 4,735,000 hours (Bellcore7 V5.0)	
Environment:	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
Warranty:	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

- 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.
- 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.
- 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.

	Declaration of Conformity	
	Name of Mfg:	Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 USA
Model Numbers:	E-100BTX-FX-N-02, E-100BTX-FX-N-02(SC), E-100BTX-FX-N-02(SM), E-100BTX-FX-NLP-02, E-100BTX-FX-NLP-02(SC), E-100BTX-FX-NLP-02(SM)	
Purpose: To declare that the E-100BTX-FX-N-02 and E-100BTX-FX-NLP02 to which this declaration refers is in conformity with the following standards. EMC Directive 2004/108/EC; EN 55022:2006+A1:2007 Class A; EN55024:1998+A1:2001+A2:2003; EN61000-3-2; EN61000-3-3; CFR Title 47 Part 15 Subpart B Class A; Low Voltage Directive: 2006/95/EC; CFR Title 21 Section 1040.10 Class I		
I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).		
 Stephen Anderson, Vice-President of Engineering	November 2010 Date	

Compliance Information

FCC Regulations

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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 communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to correct the interference.

Canadian Regulations

This digital apparatus does not exceed the Class B 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 B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

European Regulations

Warning This is a Class B 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 B. 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 B. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.



In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Transition Networks will accept post usage returns of this product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.



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

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 and click the Transition Now link.

Transition Networks - 10900 Red Circle Drive - Minnetonka, MN 55343, U.S.A.

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

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