



USER'S GUIDE
E-100BTX-FX-05(10x)
Stand-Alone Media Converter

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

Transition Networks **E-100BTX-FX-05(10x)** Fast Ethernet Media Converter connects 100Base-TX shielded or unshielded twisted-pair copper cable to single connector 100Base-FX fiber-optic cable.

Part Number	Port One - Copper	Port Two - Simplex Fiber-Optic
E-100BTX-FX-05(100) **	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX)/1550 nm (RX) singlemode, 20 km (12.4 miles)*
E-100BTX-FX-05(101) **	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX)/1310 nm (RX) singlemode, 20 km (12.4 miles)*
E-100BTX-FX-05(102) ***	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX)/1550 nm (RX) singlemode, 40 km (24.8 miles)*
E-100BTX-FX-05(103) ***	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX)/1310 nm (RX) singlemode, 40 km (24.8 miles)*

* Typical maximum cable distance. (Actual distance is dependent upon the physical characteristics of the network.) (TX) = transmit (RX) = receive

** **E-100BTX-FX-05(100)** and **(101)** are intended to be installed in the same network where one is the *local* converter and the other is the *remote* converter.

*** **E-100BTX-FX-05(102)** and **(103)** are intended to be installed in the same network where one is the *local* converter and the other is the *remote* converter.

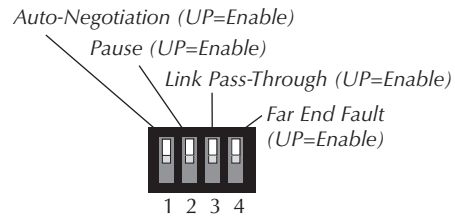
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Installation

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

4-Position Switch

The 4-position switch is located on the side of the Media Converter. Use a small flatblade screwdriver or a similar device to set the recessed switches (see the drawing to the right).



1. Auto-Negotiation

UP Advertises 100Mb/s full-duplex and half-duplex (see page 5).
DOWN Disables Auto-Negotiation. The Media Converter operates at 100 Mb/s in the duplex mode (full or half) of the attached device. (This setting is primarily used when connecting to a hub).

2. Pause Control Frame

(Applies **ONLY** if switch 1 is UP **AND** the Media Converter is connected to Auto-Negotiation device(s) capable of Pause Control Frame.)

UP Enables Pause Control (see page 6).
DOWN Disables Pause Control.

3. Link Pass-Through

UP Enables Link Pass-Through (see page 6).
DOWN Disables Link Pass-Through.

4. Far-End Fault

UP Enables Far-End Fault (see page 6).
DOWN Disables Far-End Fault.

AutoCross Jumper

The *AutoCross*™ feature allows either straight-through (MDI) or crossover (MDI-X) cables to be used when connecting to devices such as hubs, transceivers, or network interface cards (NICs). *AutoCross* determines the characteristics of the cable connection and automatically configures the Media Converter to link up, regardless of the cable configuration.

The jumper is located on the circuit board inside the Media Converter housing. To set the jumper:

1. Using a small screwdriver, remove the four (4) screws that secure the cover and carefully remove the cover from the Media Converter.



Enable AutoCross

2. Locate the J3 jumper on the circuit board and, using small needle-nosed pliers or similar device, move the jumper to the desired position (see the drawing to the right).



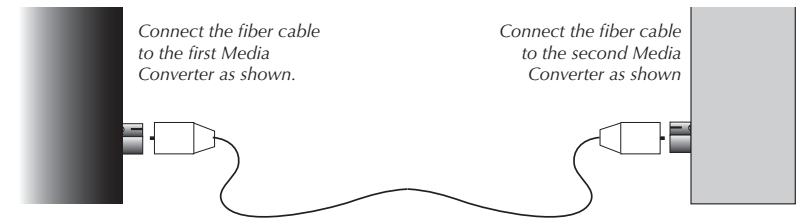
Disable AutoCross

3. Carefully replace the cover on the Media Converter and replace the four (4) screws that secure the cover to the Media Converter.

Installation -- Continued

Connect the Fiber Cable

1. Locate or build 100Base-FX compliant fiber cable with male, single-stranded simplex connectors installed at both ends.
2. Connect the simplex connector at one end of the cable to the single-strand fiber port on the first E-100BTX-FX-05(10x) Media Converter.
3. Connect the simplex connector at the other end of the cable to the single-strand fiber port on the second E-100BTX-FX-05(10x) Media Converter.



Connect the Twisted-Pair Copper Cable

1. Locate or build 100Base-TX compliant cables, with male RJ-45 connectors installed at both ends.
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the E-100BTX-FX-05(10x) Media Converter.
3. Connect the RJ-45 connector at the other end of the cable to the RJ-45 port on the other device (switch, workstation, etc.).



Power the Media Converter

AC

1. Install the power adapter cord to the back of the Media Converter.
2. Connect the power adapter plug to AC power.
3. Verify that the Media Converter is powered by observing the illuminated LED power indicator light.

DC

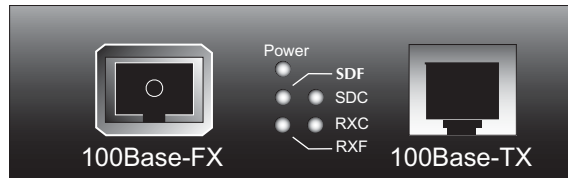
Consult the User's Guide for the Transition Networks SPS1872-xx DC External Power Supply for powering the Media Converter.

Operation

Status LEDs

The E-100BTX-FX-05(10x) Media Converter is designed to operate without user intervention. Use the status LEDs to monitor the Media Converter operation in the network.

Power	<i>On</i>	Connection to external AC power.
SDF	<i>On</i>	(Signal Detect/Fiber) A link has been established for the Fiber connection.
SDC	<i>On</i>	(Signal Detect/Copper) A link has been established for the Copper connection.
RXC	<i>Flashing</i>	(Copper Receive) The Copper connection is receiving data.
RXF	<i>Flashing</i>	(Receive Fiber) The Fiber connection is receiving data.



Product Features

Auto-Negotiation

The Auto-Negotiation feature brings up the copper links in the highest speed and mode possible for all the attached network devices.

NOTE: The E-100BTX-FX-05(10x) series Media Converter does NOT support rate conversion between 10Mb/s, 100Mb/s, and 1000Mb/s network devices.

Pause Control Frame

The Pause Control Frame feature can improve network performance by allowing one end of the link to signal the other to discontinue frame transmission for a set period of time to relieve buffer congestion.

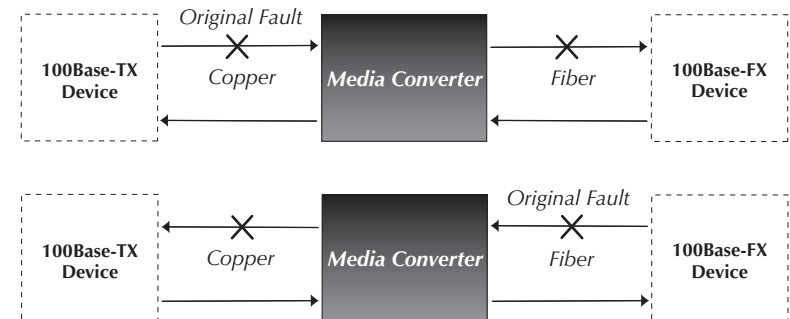
NOTE: If the Pause Control feature is present on ALL network devices attached to the Media Converter(s), enable the Pause Control feature on the Media Converter(s). Otherwise, disable the Pause Control feature (see page 2).

Operation -- Continued

Product Features -- Continued

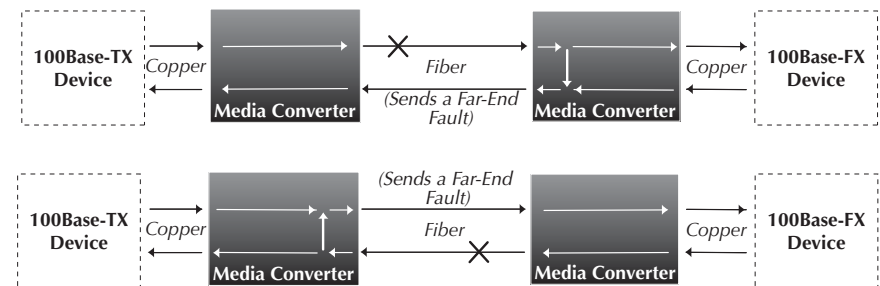
Link Pass-Through

When the Link Pass-Through feature is activated (see page 2), a fault on one side of the Media Converter stops the signal and data transmission on the other side of the Media Converter. If the Media Converter does not detect a good link on the copper side, the Media Converter disables all transmission (including active-idle) on the fiber side.



Far-End Fault

When the Far-End Fault feature is activated (see page 2), a fault on an incoming fiber link causes the Media Converter to transmit a Far-End Fault signal on the outgoing fiber link. In addition the Far-End Fault signal also activates the Link Pass-Through, which, in turn, disables the link on the copper portion of the network.



Operation - Continued

Product Features -- Continued

Full Duplex Network

In a full-duplex network, maximum cable lengths are determined by **the type of cables** that are used. See page 1 (front cover) for the cable specifications for the different E-100BTX-FX-05(10x) models.

The 512-Bit Rule **does not apply** in a full-duplex network.

Half-Duplex Network (512-Bit Rule)

In a half-duplex network, the maximum cable lengths are determined by the round trip delay limitations of each Fast Ethernet **collision domain**. (A collision domain is the longest path between any two terminal devices, e.g. a **terminal, switch, or router**.)

The 512-Bit Rule determines the maximum length of cable permitted by calculating the round-trip delay in **bit-times (BT)** of a particular collision domain. If the result is less than or equal to 512 BT, the path is good.

For more information on the 512-Bit Rule, see the white paper titled “*Collision Domains*” on the Transition Networks website at:

http://www.transition.com/learning/whitepapers/collldom_wp.htm

Cable Specifications

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

Fiber Cable

Bit Error Rate:	<10 ⁻⁹
Singlemode fiber (recommended):	9 μm
Multimode fiber (recommended):	62.5/125 μm
Multimode fiber (optional):	100/140, 85/140, 50/125 μm

E-100BTX-FX-05(100)	1310 nm (TX) / 1550 nm (RX) simplex
Fiber-optic Transmitter Power:	min: -13.0 dBm max: -6.0 dBm
Fiber-optic Receiver Sensitivity:	min: -32.0 dBm max: -3.0 dBm
Link Budget:	19.0 dB

E-100BTX-FX-05(101)	1550 nm (TX) / 1310 nm (RX) simplex
Fiber-optic Transmitter Power:	min: -13.0 dBm max: -6.0 dBm
Fiber-optic Receiver Sensitivity:	min: -32.0 dBm max: -3.0 dBm
Link Budget:	19.0 dB

E-100BTX-FX-05(102)	1310 nm (TX) / 1550 nm (RX) simplex
Fiber-optic Transmitter Power:	min: -8.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -33.0 dBm max: -3.0 dBm
Link Budget:	25.0 dB

E-100BTX-FX-05(103)	1550 nm (TX) / 1310 nm (RX) simplex
Fiber-optic Transmitter Power:	min: -8.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -33.0 dBm max: -3.0 dBm
Link Budget:	25.0 dB

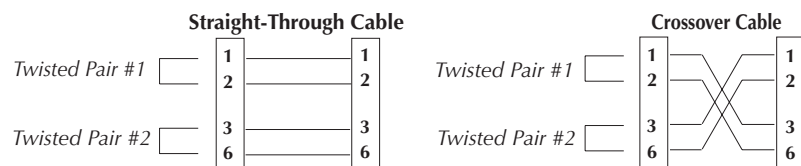
Cable Specifications -- Continued

Copper Cable

Category 5:

Gauge:	24 to 22 AWG
Attenuation:	22.0 dB /100m @ 100 MHz
Maximum Cable Distance:	100 meters

- Straight-Through **OR** Crossover cable may be used.
- Shielded Twisted-Pair (STP) **OR** Unshielded Twisted-Pair (UTP) 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.



Technical Specifications

For use with Transition Networks Model E-100BTX-FX-05(10x) or equivalent

Standards:	IEEE 802.3™
Data Rate:	100 Mb/s
Dimensions:	4.7" x 3.0" x 1.0" (119mm x 76mm x 25mm)
Weight:	6 oz. (181 g) (approximate)
MTBF	46,768 hours (<i>MIL217F2 V5.0</i>) (<i>MIL-HDBK-217F</i>) 123,821 hours (<i>Bellcore7 V5.0</i>)
Power Consumption:	2.8 Watts, 200 mA
Power Supply:	12 VDC, 0.4 A (minimum)
DC Output	minimum output regulation: 5% Connector: 2.1mm barrel, center pin positive
Environment:	Tmra*: 0 to 50°C (32 to 122°F) Storage Temperature: -20 to 85°C (-4 to 185°F) Humidity: 5 to 95%, non condensing Altitude: 0 to 10,000 feet
Warranty:	Lifetime

*Manufacturer's rated ambient temperature.

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 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.

Optional Accessories (sold separately)

Part Number	Description
SPS-1872-SA	Optional External Power Supply; 18-72VDC Stand-Alone Output: 12.6VDC, 1.0 A
SPS-1872-CC	Optional External Power Supply; 18-72VDC Piggy-back; Output: 12.6VDC, 1.0 A
E-MCR-03	12-Slot Media Converter Rack (includes universal internal power supply) 17 x 15 x 5 in. (432 x 381 x 127 mm)
WMBL	Optional Wall Mount Brackets Length: 4.0 in. (102 mm), Fits converter length: 4.7in. (119mm)
WMBV	Optional Vertical Mount Bracket; Length: 5.0 in. (127 mm)
WMBD	Optional DIN Rail Mount Bracket; Length: 5.0 in. (127 mm)
WMBD-F	Optional DIN Rail Mount Bracket (flat); Length: 3.3in. (84 mm)

Fault Isolation and Correction

If the Media Converter fails, isolate and correct the fault by determining the answers to the following questions and then taking the indicated action:

1. **Is the Power LED on the Media Converter illuminated?**
NO
 - Is the power adapter the proper type of voltage and cycle frequency for the AC outlet?
 - Is the power adapter properly installed in the Media Converter and in the outlet?
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.**YES**
 - Proceed to step 2.

2. **Is the SDC LED on the Media Converter illuminated?**
NO
 - Check the twisted-pair cables for proper connection.
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.**YES**
 - Proceed to step 3.

3. **Is the SDF LED on the Media Converter illuminated?**
NO
 - Check the fiber cables for proper connection.
 - Verify that the TX and RX cables on the Media Converter are connected to the RX and TX ports, respectively, on the other device.
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.**YES**
 - Proceed to step 4.

4. **Is the RXC LED on the Media Converter flashing?**
NO
 - If there is no activity on the copper port, proceed to step 5.
 - If there is activity on the copper port, disconnect and reconnect the twisted-pair cable to restart the initialization process.
 - Restart the workstation to restart the initialization process.
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.**YES**
 - Proceed to step 5.

5. **Is the RXF LED on the Media Converter flashing?**
NO
 - If there is no activity on the fiber port, contact Tech Support.
 - If there is activity on the fiber port, disconnect and reconnect the fiber cable to restart the initialization process.
 - Restart the workstation to restart the initialization process.
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.**YES**
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.

Contact Us

Technical Support

Technical support is available 7:00 AM - 6:00 PM CST (GMT -6:00)
 US and Canada: **1-800-260-1312**
 International: **00-1-952-941-7600**

Transition Now

Chat live via the Web with Transition Networks Technical Support.
 Log onto **www.transition.com** and click the **Transition Now** link.

Web-Based Seminars

Transition Networks provides seminars via live web-based training.
 Log onto **www.transition.com** and click the **Learning Center** link.

E-Mail

Ask a question anytime by sending an e-mail to our technical support staff.
techsupport@transition.com

Address

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 6475 City West Parkway
 Minneapolis, MN 55344, USA
 telephone: 952-941-7600
 toll free: 800-526-9267
 fax: 952-941-2322

TRANSITION networks		DECLARATION OF CONFORMITY
Name of Mfg:	Transition Networks 6475 City West Parkway, Minneapolis MN 55344 USA	
Model:	E-100BTX-FX-05(10x) Series Media Converters	
Part Number(s):	E-100BTX-FX-05(100), E-100BTX-FX-05(101), E-100BTX-FX-05(102), E-100BTX-FX-05(103)	
Regulation:	EMC Directive 89/336/EEC	
Purpose:	To declare that the E-100BTX-FX-05(10x) to which this declaration refers is in conformity with the following standards. EN 55022: 19594 Class A; EN 55024:1998; UL 1950, 3rd Edition; 21CFR subpart J	
<i>I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).</i>		
<i>Stephen Anderson</i> Stephen Anderson, Vice-President of Engineering		January 16, 2002 Date

Compliance Information

UL Listed

C-UL Listed (Canada)

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 weichen Fällen der Benutzer für entsprechende Gegenmaßnahmen werantwortlich ist.

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.

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