

100BASE-TX to 100BASE-FX

Slide-In-Module Media Converters

C/E-100BTX-FX-05

USER'S GUIDE

Designed to be installed in the TRANSITION Networks E-MCC-1600 Media Converter Chassis, C/E-100BTX-FX-05 series Ethernet™ 100BASE-TX to 100BASE-FX media converters connect 100 Mb/s copper cable to 100 Mb/s fiber cable.

C/E-100BTX-FX-05

Provides an RJ-45 twisted pair 100BASE-TX connector and a set of RX (receive) and TX (transmit) ST 100BASE-FX connectors to **1300 nm multimode** fiber-optic cable.

C/E-100BTX-FX-05(SC)

Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) SC 100BASE-FX connector to **1300 nm multimode** fiber-optic cable.

C/E-100BTX-FX-05(MT)

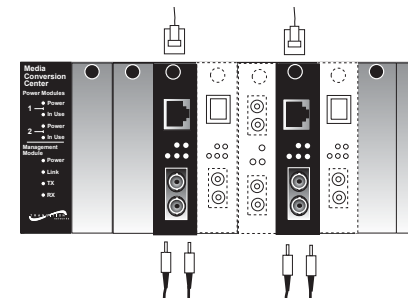
Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) MT-RJ 100BASE-FX connector to **1300 nm multimode** fiber-optic cable.

C/E-100BTX-FX-05(SM)

Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) SC 100BASE-FX connector to **1300 nm singlemode** fiber-optic cable.

C/E-100BTX-FX-05(SMLC)

Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) LC 100BASE-FX connector to **1300 nm singlemode** fiber-optic cable.



C/E-100BTX-FX-05(LH)

Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) SC 100BASE-FX connector to **1300 nm singlemode** fiber-optic cable.

C/E-100BTX-FX-05(XL)

Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) SC 100BASE-FX connector to **1300 nm singlemode** fiber-optic cable.

C/E-100BTX-FX-05(LW)

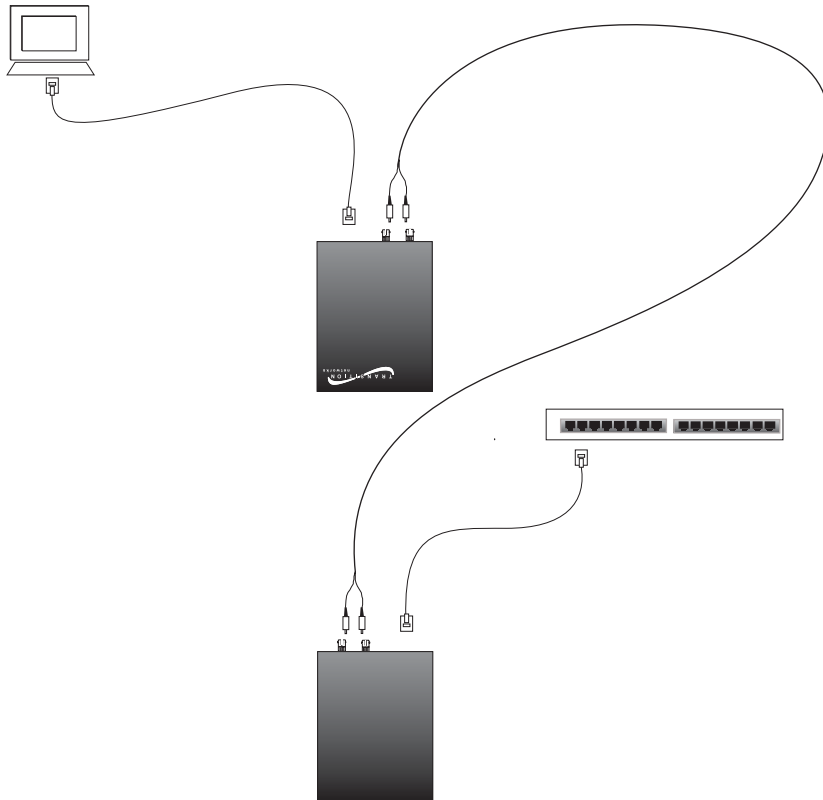
Provides an RJ-45 twisted pair 100BASE-TX connector and an RX (receive) and TX (transmit) SC 100BASE-FX connector to **1550 nm singlemode** fiber-optic cable.

C/E-100BTX-FX-05 in the Network2
Installation3
Operation6
Fault Isolation and Correction8
Cable Specifications9
Technical Specifications11
Compliance Information12

C/E-100BTX-FX-05 IN THE NETWORK

Use the media converter (or two media converters in pairs) to connect a workstation to a remote hub or to connect two hubs, switches, or workstations.

TRANSITION Networks C/E-100BTX-FX-05 100BASE-TX to 100BASE-FX media converters connect 100BASE-TX Ethernet™ copper cable to 100BASE-FX Ethernet™ fiber cable.



The default copper connection to the media converter is autocrossed, so that either straight-through or crossover cable can be used when connecting the media converter through twisted-pair copper to a device. An internal jumper allows the autocross feature to be disabled. (See INSTALLATION.)

A four-position switch allows selection of autonegotiation, of half-duplex or full-duplex, and of fault detection/handling.

INSTALLATION

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing Media Converter Slide-in-Module in the Media Conversion Center. Failure to observe this caution could result in damage to, and subsequent failure of, the Media Converter Slide-in-Module.

Optionally Modify Two-Position Jumper Settings

NOTE: Jumpers, located on C/E-100BTX-FX-05 series media converter circuit boards, are shipped with the default J3 jumper settings **ENABLE Autocross**. ONLY IF THE SITE REQUIRES JUMPER SETTINGS THAT **DISABLE AUTOCROSS** SHOULD THE JUMPER SETTINGS BE CHANGED.

ENABLE AUTOCROSS When Jumper J3 is in the enabled (DEFAULT) position, either straight-through or crossover cable can be used when connecting the media converter through twisted-pair copper to a device. The media converter determines the characteristics of the cable connection and automatically configures the media converter to link up with the attached device.

DISABLE AUTOCROSS When Jumper J3 is in the disabled position, straight-through or crossover cables must be selected and installed according to the device connected to the media converter. (See page 10.)

To optionally set two-position jumper J3:

1. Locate two-position jumper on circuit board.
2. Using small needle-nosed pliers or similar device and referring to drawing for jumper positions, move jumper to new position.



INSTALLATION (continued)

Set Four-Position Switch

Switches are located at side of Media Converter Slide-in-Module circuit board.

FOUR-POSITION SWITCH SETTINGS

1 (UP) Advertises 100 Mb/s FULL-DUPLEX ONLY during autonegotiation. **(DOWN)** (Used primarily when connecting to hub.) Operates at 100 Mb/s in duplex mode of attached device.

2 Applies only if FULL-DUPLEX Switch 1 is UP AND media converter is connected to autonegotiating device(s) capable of Pause Control Frame propagation. (UP) ALLOWS Pause Control Frame propagation. (See page 7.) (DOWN) Does NOT allow Pause Control Frame propagation.

3 (UP) Enables Link Pass-Through. (See page 7.) **(DOWN)** Disables Link Pass-Through.

4 (UP) Enables Far-End Fault. (See page 7.) **(DOWN)** Disables Far-End Fault.

To set four-position switch:

1. Locate four-position switch at side of circuit board.
2. Using small flatblade screwdriver or similar device and referring to drawing, set switch according to site requirements.

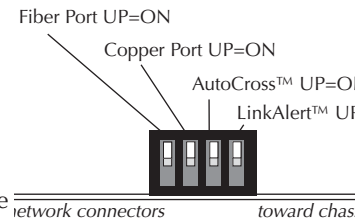
*When RJ-45 cable is installed at a device that is “hard-set” to a specific speed and mode, the connecting device may not go through the autonegotiation sequence. Therefore, set Dip Switch 1 DOWN to run the Media Converter at the speed and mode of the connecting device.

Install Slide-In-Module in Media Conversion Center Chassis

NOTE : Install Media Converter Slide-in-Modules in any slot, in any order.

To install Media Converter Slide-in-Module:

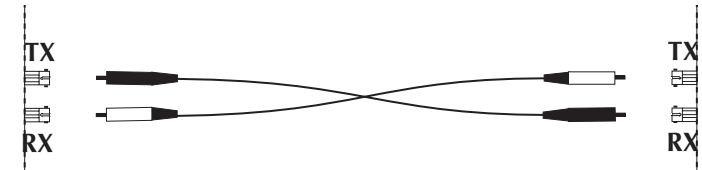
1. Remove Media Converter Slide-in-Module protective plate from selected installation slot by removing screw that secures plate to Media Conversion Center.
2. Carefully slide Media Converter Slide-in-Module into installation slot, aligning with installation guides. NOTE: Ensure that Media Converter Slide-in-Module is firmly seated against the backplane.
3. Secure Media Converter Slide-in-Module by rotating panel fastener screw attached to Media Converter Slide-in-Module clockwise.



Install Cable

FIBER

1. Locate or build 802.3 compliant fiber cable with male two-stranded TX to RX connectors installed at both ends.



2. Connect cable with connector installed at TX location on media converter to RX location on attached device.
3. Connect cable with connector installed at RX location on media converter to TX location on attached device.

COPPER

NOTE: Do NOT exceed 100 meters distance on twisted-pair cable runs.

1. Locate or build IEEE 802.3 compliant straight-through* twisted-pair copper cables (if the default autocross jumper configuration is used), with male RJ-45 plug connectors at both ends.
2. Connect male RJ-45 plug connector at one end of cable to media converter RJ-45 jack connector.
3. Connect male RJ-45 plug connector at other end of cable to DTE terminal device or hub RJ-45 jack connector.

*If the default autocross jumper configuration (see page 3) is NOT used, install crossover twisted-pair copper cable between the media converter and a terminal device and install straight-through twisted-pair copper cable between the media converter and a hub. (See page 6.)

Power the Slide-In-Module

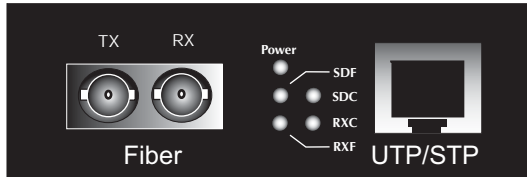
NOTE: The Slide-In-Module is powered through the Media Conversion Center.

OPERATION

After installation, the media converter should function without operator intervention.

Status LEDs

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



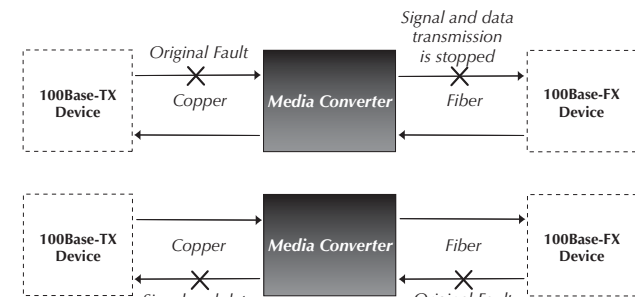
- Power** Illuminated green LED indicates connection to external AC power.
- SDF** Signal Detect/Fiber: Steady green LED indicates fiber port is connected to device.
- SDC** Signal Detect/Copper: Steady green LED indicates RJ-45 twisted-pair copper port is connected to device.
- RXC** Receive/Copper: Flashing green LED indicates packets are seen on twisted-pair copper RJ-45 port.
- RXF** Receive/Fiber: Flashing green LED indicates packets are seen on fiber port.

Pause Control Frame

When both ends of a full-duplex media converter link are able to send and receive Pause Control Frames AND the media converter four-position switch is set to allow Pause Control Frame propagation (see page 3), then 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.

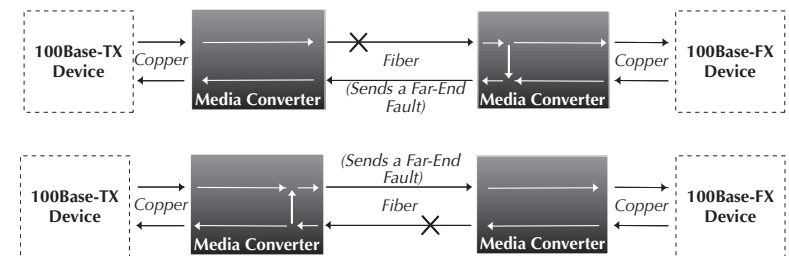
Link Pass-Through

When the media converter four-position switch is set to allow Link Pass-Through (see page 4), then a fault on one side of the media converter stops signal and data transmission on the other side.



Far-End Fault

When the media converter four-position switch is set to *enable* Far-End Fault (see page 4), then a fault on an incoming fiber link causes the media converter to transmit a Far-End Fault signal on the outgoing fiber link.



FAULT ISOLATION and CORRECTION

If the media converter fails, isolate and correct the failure 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 media converter inserted properly into the chassis?
- Is the power cord properly installed in the chassis and at the external power source?
- Does the external power source provide power?
- Contact Technical Support at (800) 260-1312.

YES

- Proceed to step 2.

2. Is the **SDC (Signal Detect/Copper) LED illuminated?**

NO

- Check UTP cables for proper connection.
- Contact Technical Support at (800) 260-1312.

YES

- Proceed to step 3.

3. Is the **SDF (Signal Detect/Fiber) LED illuminated?**

NO

- Check fiber cables for proper connection.
- Verify that TX and RX cables on media converter are connected to RX and TX ports, respectively, on the other 100BASE-FX device.
- Refer to Tech Tips available at: <http://www.transition.com>
- Contact Technical Support at (800) 260-1312.

YES

- Contact Technical Support at (800) 260-1312.

CABLE SPECIFICATIONS

The physical characteristics of the media cable must meet or exceed IEEE 802.3 specifications.

Fiber Cable

Bit error rate: 10^{-9}

MULTIMODE

Fiber Optic Cable Recommended: 62.5 / 125 μ m multimode fiber
Optional: 100 / 140 μ m multimode fiber
85 / 125 μ m multimode fiber
50 / 125 μ m multimode fiber

C/E-100BTX-FX-05

C/E-100BTX-FX-05(SC)
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

Typical Maximum Cable Distance*: 2 kilometers

C/E-100BTX-FX-05(MT)

C/E-100BTX-FX-05(MT)
Fiber Optic Transmitter Power: min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity: min: -33.5 dBm max: -14.0 dBm
Link Budget: 15.0 dB

Typical Maximum Cable Distance*: 2 kilometers

SINGLEMODE

Fiber Optic Cable Recommended: 9 μ m singlemode fiber
1300 nM

C/E-100BTX-FX-05(SM)
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

Typical Cable Distance*: 20 kilometers

C/E-100BTX-FX-05(SMLC)

C/E-100BTX-FX-05(SMLC)
Fiber-optic Transmitter Power: min: -15.2 dBm max: -8.0 dBm
Fiber-optic Receiver Sensitivity: min: -32.5 dBm max: -3.0 dBm
Link Budget: 17.3 dB

Typical Cable Distance*: 20 kilometers

C/E-100BTX-FX-05(LH)

C/E-100BTX-FX-05(LH)
Fiber-optic Transmitter Power: min: -8.0 dBm max: -2.0 dBm
Fiber-optic Receiver Sensitivity: min: -34.0 dBm max: -7.0 dBm
Minimum Attenuation: 8 dB

Typical Cable Distance*: 40 kilometers

C/E-100BTX-FX-05(XL)

C/E-100BTX-FX-05(XL)
Fiber-optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity: min: -34.0 dBm max: -7.0 dBm
Minimum Attenuation: 7 dB

Typical Cable Distance*: 60 kilometers

C/E-100BTX-FX-05(LW)

C/E-100BTX-FX-05(LW)
Fiber-optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity: min: -34.0 dBm max: -7.0 dBm
Spectral Width: 0.4 nm FWHM

Minimum Attenuation: 7 dB

Typical Cable Distance*: 80 kilometers

*Actual distance dependent upon physical characteristics of network installation.

The fiber optic transmitters meet Class I Laser safety requirements per IEC-825/CDRH standards and comply with 21 CFR1040.10 and 1040.11.

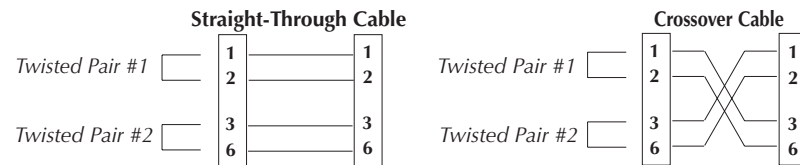
CABLE SPECIFICATIONS (continued)

Copper Cable

Category 5 shielded twisted-pair (STP) or unshielded twisted-pair (UTP) copper wire is required. DO NOT USE FLAT OR SILVER SATIN WIRE.

CATEGORY 5:

Gauge	24 to 22 AWG
Attenuation	22.0 dB /100m @ 100 MHz
Maximum Cable Distance:	100 meters
RJ-45 Pin-out:	Pin 1=TD+, Pin 2=TD-, Pin 3=RD+, Pin 6=RD-



The two active pairs in a 100BASE-TX network are pins 1 & 2 and pins 3 & 6. Use only dedicated wire pairs (such as blue/white & white/blue, orange/white & white/orange) for the active pins.

TECHNICAL SPECIFICATIONS

Standards	IEEE 802.3
Case Dimensions	4.75" x 3.0" x 1.0" (119mm x 76mm x 25mm)
Shipping Weight	3 pounds (1.4 kilograms)
Environment	Typical Operating Temperature: 0° to 50°C (32° to 122°F) Storage Temperature: -20° to 85°C (-4° to 185°F) Humidity: 10-90%, non condensing Altitude: 0-10,000 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 Transition Networks PointSystem™ chassis 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.

	DECLARATION OF CONFORMITY
Name of Mfg:	Transition Networks 6475 City West Parkway, Minneapolis MN 55344 USA
Model:	C/E-100BTX-FX-05 Series Media Converters
Part Number(s):	C/E-100BTX-FX-05, C/E-100BTX-FX-05(SC), C/E-100BTX-FX-05(MT), C/E-100BTX-FX-05(SM), C/E-100BTX-FX-05(SMLC), C/E-100BTX-FX-05(LH), C/E-100BTX-FX-05(XL), C/E-100BTX-FX-05(LW)
Regulation:	EMC Directive 89/336/EEC
Purpose :	To declare that the C/E-100BTX-FX-05 to which this declaration refers is in conformity with the following standards.
	CISPR 22:1993; EN 55022: 1994+A1:1995+A2:1997 Class A; EN 55024:1998; EN 61000-3-2:1995; EN 6100-3-3:1995; 21CFR subpart J
	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	May 1, 2001 Date

COMPLIANCE INFORMATION

CISPR/EN55022 Class A

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 classe 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.

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