

User's Guide

CBFTF10xx-15x

Slide-in-Module Media Converter

- **Copper to Fiber**
- **10/100 Bridging (2-Port)**
- **10Base-T/100Base-TX to 100Base-FX**

The CBFTF10xx-15x 2-port Ethernet/Fast Ethernet bridging media converter is designed to be installed in a Transition Networks *PointSystem™* chassis and connects 10Base-T Ethernet or 100Base-TX Fast Ethernet twisted-pair copper network devices to network devices on a 100Base-FX Fast Ethernet fiber network.

Part Number	Port One - Copper 10Base-T/100Base-TX	Port Two - Duplex Fiber-Optic 100Base-FX
CBFTF1011-155	RJ-45 100 m (328 ft)*	ST, 1300 nm multimode 2 km (1.2 miles)*
CBFTF1013-155	RJ-45 100 m (328 ft)*	SC, 1300 nm multimode 2 km (1.2 miles)*
CBFTF1014-155	RJ-45 100 m (328 ft)*	SC, 1310 nm single mode 20 km (12.4 miles)*
CBFTF1015-155	RJ-45 100 m (328 ft)*	SC, 1310 nm single mode 40 km (24.8 miles)*
CBFTF1018-155	RJ-45 100 m (328 ft)*	MT-RJ, 1300 nm multimode 2 km (1.2 miles)*
CBFTF1029-155**	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX)/1550 nm (RX) single mode, 20 km (12.4 miles)*
CBFTF1029-156**	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX)/1310 nm (RX) single mode, 20 km (12.4 miles)*
CBFTF1029-157***	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX)/1550 nm (RX) single mode, 40 km (24.8 miles)*
CBFTF1029-158***	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX)/1310 nm (RX) single mode, 40 km (24.8 miles)*

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

** CBFTF1029-155 and CBFTF1029-156 are intended to be installed in the same network where one is the local converter and the other is the remote converter.

*** CBFTF1029-157 and CBFTF1029-158 are intended to be installed in the same network where one is the local converter and the other is the remote converter.

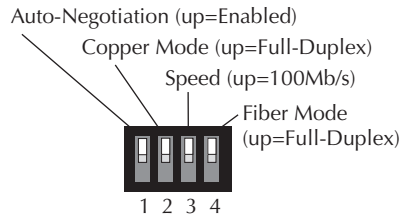
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Installation

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting the 4-position switch, removing and inserting circuit board jumper(s), and installing the slide-in-module. Failure to observe this caution could result in damage to, and subsequent failure of, the media converter.

Set the 4-Position Switch

- The 4-position switch is located on the side of the media converter.
- Use a small flat blade screwdriver or a similar device to set the recessed switches.
- Refer to the drawing to the right for the locations of the individual switches.



- Auto-Negotiation
 - up Enables Auto-Negotiation on the copper port. Advertises 100 Mb/s full duplex and half duplex, and 10 Mb/s full duplex and half duplex.
 - down Disables Auto-Negotiation on the copper port.
- Copper Mode

(Applies only if switch 1 is down.)

 - up Forces full duplex operation on the copper port.
 - down Forces half duplex operation on the copper port.

(Parallel detection only with Auto-Negotiation enabled)

 - up Parallel detects in IEEE standard half duplex
 - down Non-standard full duplex
- Speed

(Applies only if switch 1 is down.)

 - up Forces 100 Mb/s operation on the copper port.
 - down Forces 10 Mb/s operation on the copper port.
- Fiber Mode
 - up Forces full duplex operation on the fiber port.
 - down Forces half duplex operation on the fiber port.

Installation -- Continued

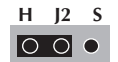
Set the Jumpers

The jumpers are located on the media converter circuit board. Use small needle-nosed pliers or a similar device to set the jumper.

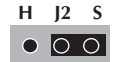
The Hardware/Software jumper is labeled “H” for hardware and “S” for software.

Hardware The media converter mode is determined by the 4-position switch settings listed above.

Software The media converter mode is determined by the most-recently saved, on-board microprocessor settings.



Hardware Mode



Software Mode

The Far-End Fault jumper is labeled “E” for enable Far-End Fault and “D” for disable Far-End Fault.

Enable A fault on the fiber link causes the media converter to transmit a Far-End Fault signal.

Disable No Far-End Fault signal is transmitted when a fault occurs.



Enable Far-End Fault

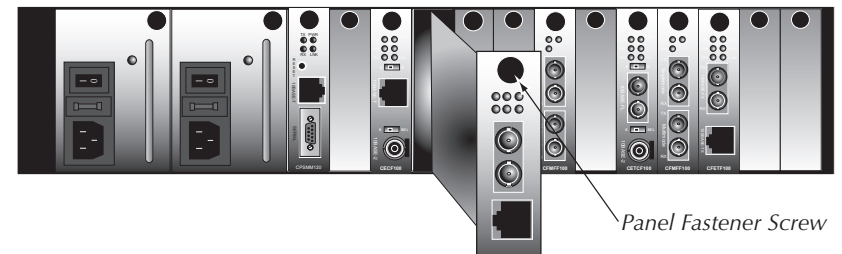


Disable Far-End Fault

Install the Slide-in-Module

To install the CBFTF10xx-15x media converter slide-in-module:

- Locate an empty installation slot on the *PointSystem™* chassis.
- Carefully slide the module into the installation slot, aligning the module with the installation guides.
- Ensure that the module is firmly seated inside the chassis.
- Push in and rotate the panel fastener screw to secure the module to the chassis front.



Power the Media Converter

The CBFTF10xx-15x module media converter is powered through the *PointSystem™* chassis.

Installation -- Continued

Install the Twisted-Pair Copper Cable

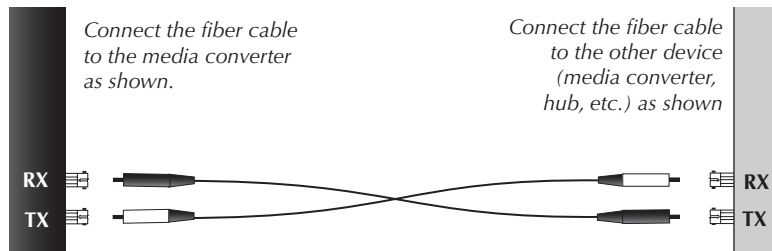
1. Locate or build IEEE 803.2™ compliant 10Base-T or 100Base-TX cables, with straight-through RJ-45 cable, and with straight-through RJ-45 connectors installed at both ends.
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port connector on the media converter.
3. Connect the RJ-45 connector at the other end of the cable to the RJ-45 port connector on the other device (*switch, workstation, etc.*).

NOTE: The MDI (*straight-through*) or MDI-X (*crossover*) cable connection is configured automatically, according to the network conditions.



Install the Fiber Cable

1. Locate or build IEEE 803.2™ compliant 100Base-FX fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the CBFTF10xx-15x media converter as described:
 - Connect the male TX cable connector to the female TX connector.
 - Connect the male RX cable connector to the female RX connector.
3. Connect the fiber cables to the other device (*media converter, hub, etc.*) as described:
 - Connect the male TX cable connector to the female RX connector.
 - Connect the male RX cable connector to the female TX connector.



Operation

Status LEDs

Use the status LEDs to monitor the media converter and the network connections.

FDPX (Fiber Duplex)

- On = full duplex fiber connection.
- Off = half duplex fiber connection.

FLNK (Fiber Link)

- On = Fiber link connection.
- Blinking = Fiber network activity.

PWR (Power)

- On = Chassis power.

TSPD (Twisted-Pair Speed)

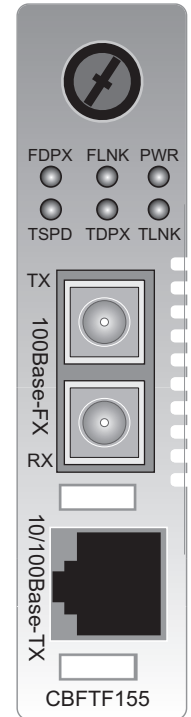
- On = 100 Mb/s.
- Off = 10 Mb/s.

TDPX (Twisted Pair Duplex)

- On = full duplex copper connection.
- Off = half duplex copper connection.

TLKN (Twisted Pair Link)

- On = Copper link connection.
- Blinking = Copper network activity.



Operation - Continued

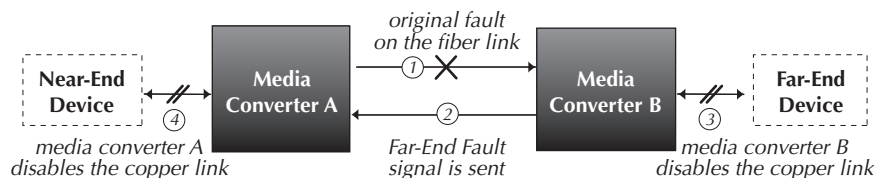
Product Features

AutoCross™

The AutoCross feature detects and configures the twisted-pair copper port on the CBFTF10xx-15x media converter to the correct straight-through (MDI) or crossover (MDI-X) configuration. This feature allows either MDI or MDI-X cable to connect the media converter to devices such as hubs, transceivers, or network interface cards (NICs). *(This feature does not require operator intervention.)*

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, which, in turn, disables the link on the copper portion of the network (3) and (4).



Auto-Negotiation

The Auto-Negotiation feature allows the CBFTF10xx-15x media converter to automatically configure itself to achieve the best possible mode of operation over a link. The media converter will broadcast its speed (10 Mb/s or 100 Mb/s) and duplex capabilities (full or half) to the other devices and negotiates the best mode of operation. Auto-Negotiation allows quick and easy installation because the optimal link is established automatically. No user intervention is required to determine the best mode of operation.

A scenario where the media converter is linked to a non-negotiating device is a case where the user may want to **disable** Auto-Negotiation. In this instance, the mode of operation will drop to the least common denominator between the two devices (e.g. 100 Mb/s, half duplex). Disabling this feature gives the user the ability to force the connection to the best mode of operation.

Parallel detection

Parallel detection is the method used to link when an auto negotiating port detects a link partner that is in forced mode and therefore cannot participate in the auto negotiating process. Parallel Detection can be set to IEEE Standard half duplex, or the non-standard full duplex. Switch settings for parallel detection are valid in hardware or software mode, only when Auto-Negotiation is enabled.

Operation - Continued

Product Features - Continued

Parallel detection --continued

Per the IEEE method, an auto negotiating port that detects a forced link partner should drop to the detected speed (10Mb/s or 100Mb/s) and default to half duplex

The CBFTF-155 allows bypassing the IEEE method by setting the parallel detection default mode to half or full duplex via DIP switch 3.

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 CBFTF10xx-15x models.

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-line at: www.transition.com.

SNMP

See the on-line documentation that comes with Transition Networks FocalPoint™ software for applicable commands and usage.

Use SNMP at an attached terminal or at a remote location to monitor the media converter by monitoring:

- Media converter power
- Serial and port number
- Chassis slot position
- Copper and fiber link status
- Copper and fiber duplex mode
- Copper port speed
- Hardware switch setting

Also, use SNMP to enter network commands that do the following:

- Enable/disable Auto-Negotiation on copper
- Force 10Mb/s or 100Mb/s on copper
- Force full duplex or half duplex on copper
- Force full duplex or half duplex on fiber
- Enable/disable Far-End Fault on fiber

Cable Specifications

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

Fiber Cable

Bit Error Rate:	<10 ⁻⁹	
Single mode fiber (recommended):	9 μm	
Multimode fiber (recommended):	62.5/125 μm	
Multimode fiber (optional):	100/140, 85/140, 50/125 μm	
CBFTF1011-155, CBFTF1013-155	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	
CBFTF1014-155	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	
CBFTF1015-155	single mode	
Fiber-optic Transmitter Power:	min: -8.0 dBm	max: -2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm	max: -7.0 dBm
Link Budget:	26.0 dB	
CBFTF1018-155	multimode	
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:	14.5 dB	
CBFTF1029-155, CBFTF1029-156	single mode	
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	
CBFTF1029-157, CBFTF1029-158	single mode	
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	

Copper Cable Maximum Cable Distance: 100 meters

Category 3: (Minimum requirement for 10 Mb/s operation)

Gauge 24 to 22 AWG

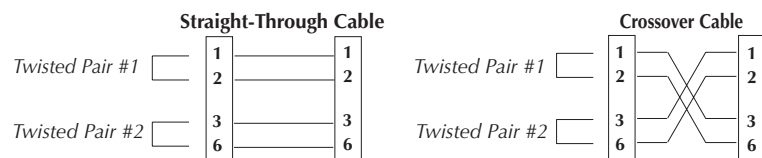
Attenuation 11.5 dB/100m @ 5-10 MHz

Category 5: (Minimum requirement for 100 Mb/s operation)

Gauge 24 to 22 AWG

Attenuation 22.0 dB /100m @ 100 MHz

- Straight-through (MDI) or crossover (MDI-X) twisted-pair cable must 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 .
- 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 CBFTF10xx-15x or equivalent.

Standards	IEEE 802.3™
Data Rate:	10 Mb/s, 100 Mb/s
Dimensions	3.4" x 4.7" x 0.87" (86 mm x 119 mm x 22 mm)
Weight	4 oz. (114 g) (approximate)
Power Consumption:	4.0 W
MTBF	629,000 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 1,630,000 hours (Bellcore7 V5.0)
Packet Size:	Unicast MAC address: 128K bytes (1 Mbit) Maximum packet size: 1522 bytes Memory: 1K bytes
Environment	Tmra*: 0 to 60°C (32 to 140°F) Storage Temp: -20 to 85°C (-4 to 185°F) Humidity: 10 to 90%, 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 Transition Networks PointSystem™ chassis in which this slide-in-module will be installed.

The information in this user's guide is subject to change. For the most up-to-date information on the CBFTF10xx-15x media converter, view the user's guide on-line at: www.transition.com.

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.

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.

Troubleshooting

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 PWR (*power*) LED 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 and does the external power source provide power?
 - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 2.

2. Is the TLNK (*twisted-pair link*) LED illuminated?
 - NO
 - Check the copper cables for proper connection and pin assignment.
 - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 3.

3. Is the FLNK (*fiber-pair link*) LED illuminated?
 - NO
 - Check the fiber cables for proper connection.
 - Verify that the TX and RX cables are connected to the RX and TX ports, respectively, on the 100Base-FX device.
 - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 4.

4. Is the TSPD (*twisted-pair speed*) LED illuminated?
 - NO
 - Check the copper cables for proper connection.
 - Off = The media converter has selected 10Mb/s operation.
 - If the speed is not correct, disconnect and reconnect the twisted pair cable to restart the initialization process.
 - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - On = The media converter has selected 100Mb/s operation.
 - If the speed is not correct, disconnect and reconnect the twisted pair cable to restart the initialization process.
 - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

Contact Us

Technical Support

Technical support is available 24 hours a day.
 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

Transition Networks
 6475 City West Parkway, Minneapolis, MN 55344, U.S.A.
 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 U.S.A.
Model:	CBFTF10xx-15x Series Media Converters
Part Number(s):	CBFTF1011-155, CBFTF1013-155, CBFTF1014-155, CBFTF1015-155, CBFTF1018-155, CBFTF1029-155, CBFTF1029-156, CBFTF1029-157, CBFTF1029-158
Regulation:	EMC Directive 89/336/EEC
Purpose:	To declare that the CBFTF10xx-15x to which this declaration refers is in conformity with the following standards. EMC-CISPR 22:1985 Class A; EN 55022:1998 Class A; FCC Part 15 subpart B; 22 CFR 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	January, 2007 Date

Compliance Information

CISPR22/EN55022 Class A
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.

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