

# User Guide

## CBFTF10xx-1xx

### Slide-in-Module Media Converter

- Extend network distance up to 120 km with an SFP module
- Convert 10/100 on copper to straight 100 on fiber
- Half or Full-Duplex on both ports
- Fully manageable
- Auto-Negotiation and AutoCross™
- Link Pass Through (LPT) and Far-End-Fault (FEF)
- Automatic Link Restoration
- Field Upgradeable Firmware
- Can be used with any Point System™ Chassis
- Bridging media converters provide conversion and integration solutions for half- and full-duplex environments



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## Introduction

Transition Networks CBFTF10xx-10x two-port Ethernet/Fast Ethernet bridging media converter 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.

The CBFTF10xx-10x provides an interface between 10/100Base-TX ports and 100Base-FX ports, allowing you to integrate fiber optic cabling into 10/100Base-TX copper environments. Operating at Layer 2, this converter not only converts copper to fiber, but it also does Rate Conversion, converting 10/100 copper to 100Base fiber.

## Ordering Information

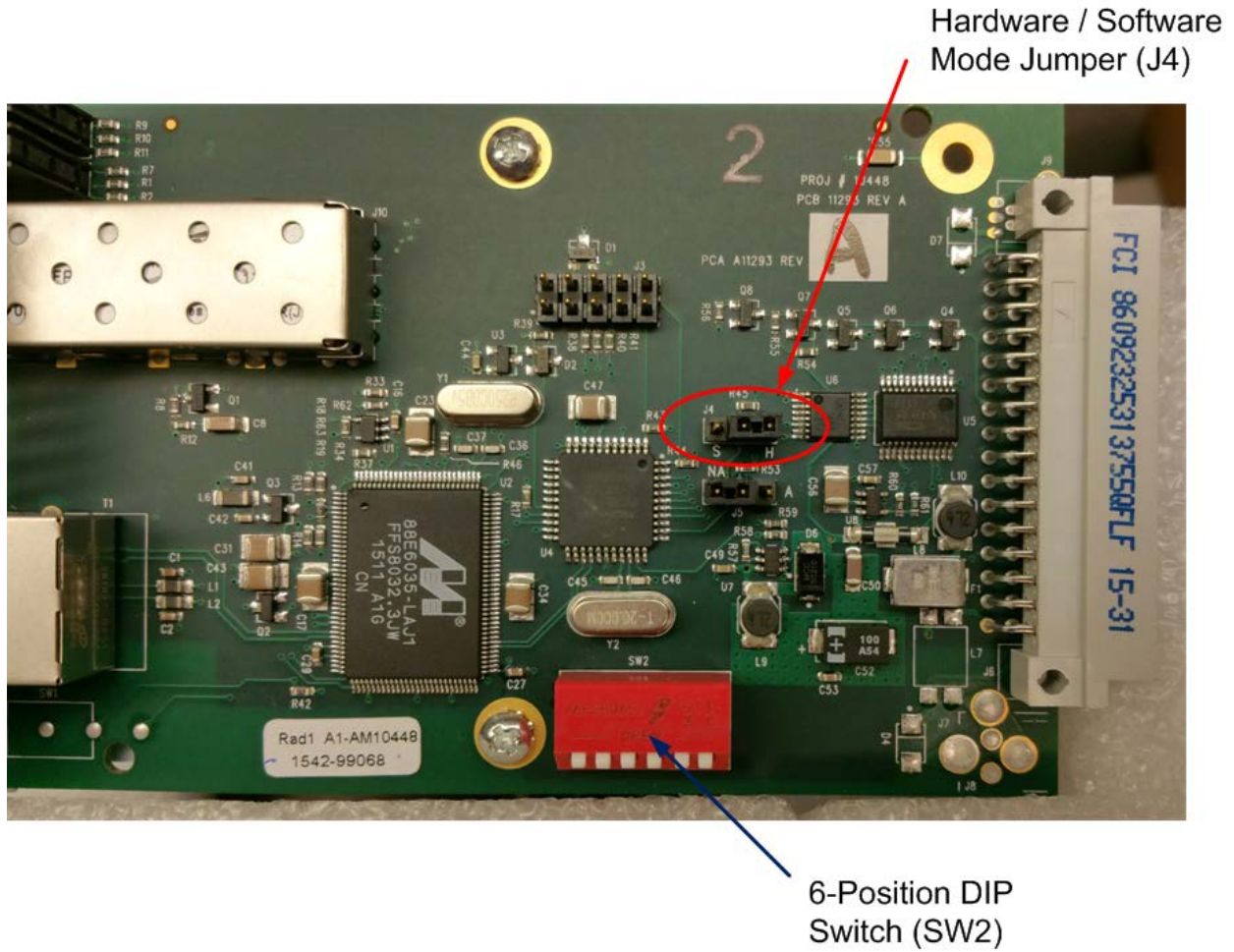
SKU	Description
<b>CBFTF1011-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1300nm MM (ST) [2 km/1.2 mi.] Link Budget: 11.0 dB
<b>CBFTF1013-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1300nm MM (SC) [2 km/1.2 mi.] Link Budget: 11.0 dB
<b>CBFTF1039-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1300nm MM (LC) [2 km/1.2 mi.] Link Budget: 11.0 dB
<b>CBFTF1014-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1310nm SM (SC) [20 km/12.4 mi.] Link Budget: 16.0 dB
<b>CBFTF1019-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1310nm SM (LC) [20 km/12.4 mi.] Link Budget: 17.3 dB
<b>CBFTF1040-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-X SFP Slot (empty)
<b>Single Fiber Products</b>	Recommended use in pairs
<b>CBFTF1029-105</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) [20 km/12.4 mi.] Link Budget: 19.0 dB
<b>CBFTF1029-106</b>	10/100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) [20 km/12.4 mi.] Link Budget: 19.0 dB

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

\*\* CBFTF1029-105 and CBFTF1029-106 are intended to be installed in the same network where one is the local converter and the other is the remote converter.

## DIP Switch and Jumper Locations

PCB 11293 Rev. A is shown below.

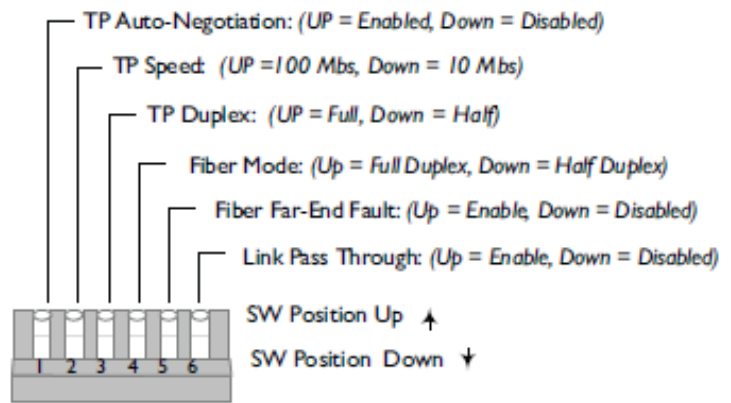


## Installation

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when setting the 6-position DIP switch. Failure to observe this caution could result in damage to the media converter.

## Set 6-position DIP Switch (SW2)

The 6-position DIP switch (SW2) is located on the edge of the PCB. Use a small flat blade screwdriver to set the recessed switches. See below for the individual switch settings.



### 1. Auto-Negotiation

up Enables Auto-Negotiation on the copper port.

Advertises the setting of switches 2 and 3.

down Disables Auto-Negotiation on the copper port. Forces the setting of switches 2 and 3.

### 2. Speed (only functions when Switch 1 is Down)

up 100 Mb/s operation on the copper port.

down 10 Mb/s operation on the copper port.

### 3. Copper Mode Duplex (only functions when Switch 1 is Down)

up full duplex operation on the copper port.

down half duplex operation on the copper port.

*(Parallel detection only with Auto-Negotiation enabled and linked to nonnegotiating device)*

up Parallel detects in IEEE standard half duplex.

down Non-standard full duplex.

### 4. Fiber Mode

up Forces full duplex operation on the fiber port.

down Forces half duplex operation on the fiber port.

### 5. Far-End Fault (FEF)

up FEF Enabled

down FEF Disabled

### 6. Link Pass Through (LPT)

up LPT Enabled

down LPT Disabled

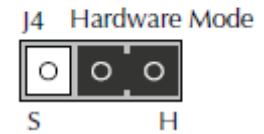
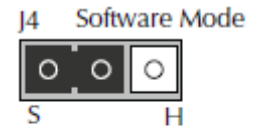
## Hardware/Software Mode Jumper (J4)

The jumpers are located on the media converter circuit board. Use a small needlenosed pliers or a similar tool to set the jumper.

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

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

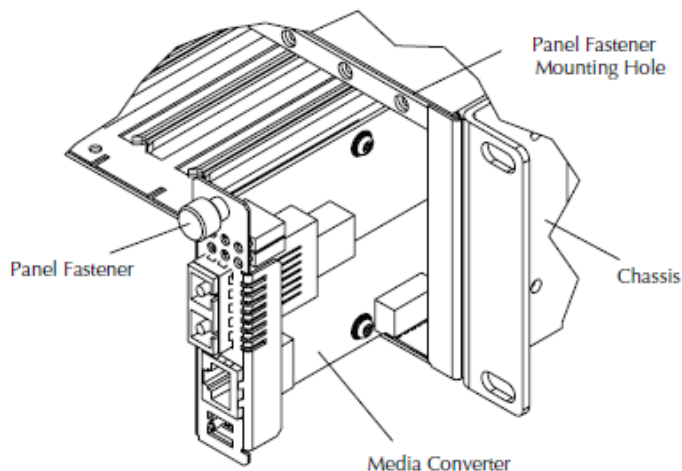
**Hardware:** The media converter mode is determined by the 6-position switch settings listed above.



## Install the Slide-in-Module

To install the CBFTF10xx-105 media converter slide-in module:

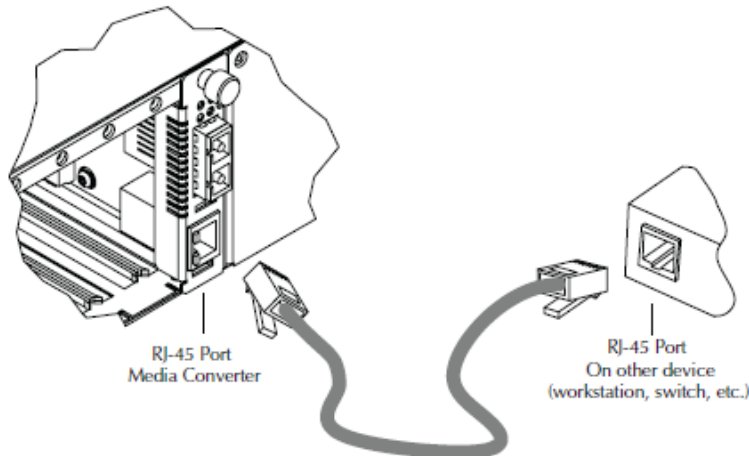
1. Locate an empty installation slot on the *PointSystem™* chassis.
2. Carefully slide the module into the installation slot, aligning the module with the installation guides.
3. Ensure that the module is firmly seated inside the chassis.
4. Push in and rotate the panel fastener screw to secure the module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



## Install the Twisted-Pair Copper Cable

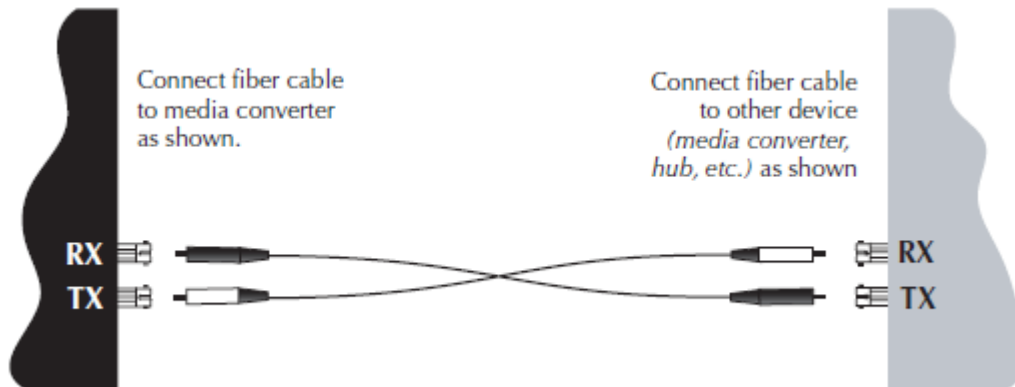
**Note:** The AutoCross feature allows either MDI (straight-through) or MDI-X (crossover) cable connections to be configured automatically, according to the network conditions.

1. Locate or build IEEE 803.2 compliant 10Base-T or 100Base-TX cable, with 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 CBFTF10xx-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.).



## Install the Fiber Cable

1. Locate an 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-10x as described:
  - Connect the male TX cable connector to the female TX port.
  - Connect the male RX cable connector to the female RX port.
3. 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.



## Operation

### **Status LEDs**

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

#### **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 = Power applied to chassis card.

#### **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.

#### **TLNK** (*Twisted Pair Link*)

ON = Copper link connection.

Blinking = Copper network activity.



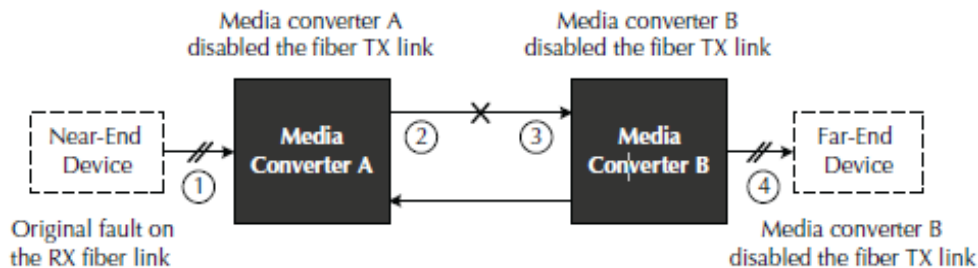
## Product Features

### AutoCross™

The AutoCross feature detects and configures the twisted-pair copper port on the CBFTF10xx-10x 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). *(No operator intervention required.)*

### Link Pass-Through

The Link Pass-Through (LPT) 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.



**LPT with Valid Link ID:** When a LPT condition occurs the Link/Activity LED for the port that still would have a link up condition, but is being forced into a link down, blinks on and off every 2 seconds while the LPT condition exists.

### 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-10x 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.

In a scenario where the media converter is linked to a non-negotiating device is a case where you 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 lets you 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.

Per the IEEE method, an auto negotiating port that detects a forced link partner should drop to the detected speed (*10Mbps or 100Mbps*) and default to HALF DUPLEX.

The CBFTF-10xx-10x 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 the cable specifications for the different CBFTF10xx-10x 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: <https://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 converter by monitoring:

- Media converter power
- Serial and part number
- Port number
- 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
- Enable/disable Link Pass Through

## Cable Specifications

The physical characteristics must meet or exceed [the IEEE 802.3™](#) specifications.

### Fiber Cable

Bit Error Rate:	<10 <sup>-9</sup>	
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	
CBFTF1011-105, CBFTF1013-105	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	
CBFTF1012-105	single mode	
Fiber-optic Transmitter Power:	min: -18.0 dBm	max: -7.0 dBm
Fiber-optic Receiver Sensitivity:	min: -32.0 dBm	max: -3.0 dBm
Link Budget:	14.0 dB	
CBFTF1014-105	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	
CBFTF1015-105 single mode	single mode	
Fiber-optic Transmitter Power:	min: -5.0 dBm	max: -2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm	max: -7.0 dBm
Link Budget:	29.0 dB	
CBFTF1016-105	single mode	
Fiber-optic Transmitter Power:	min: -4.0dBm	max: -2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -36.0 dBm	max: -3.0 dBm
Link Budget:	32.0 dB	
CBFTF1017-105	single mode	
Fiber-optic Transmitter Power:	min: -5.0 dBm	max: -0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0dBm	max: -7.0 dBm
Link Budget:	29.0 dB	
CBFTF1019-105 single mode	single mode	
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	
CBFTF1029-105, CBFTF1029-106	single mode	
Fiber-optic Transmitter Power:	min: -14.0 dBm	max: -8.0 dBm
Fiber-optic Receiver Sensitivity:	min: -33.0 dBm	max: -3.0 dBm
Link Budget:	19.0 dB	

CBFTF1029-107, CBFTF1029-108	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	
CBFTF1035-105	multimode	
Fiber-optic Transmitter Power:	min: 0.0 dBm	max: 5.0 dBm
Fiber-optic Receiver Sensitivity:	min: -36.0 dBm	max: -3.0 dBm
Link Budget:	36dB	
CBFTF1039-105	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:	11dB	

**Copper Cable** maximum cable distance: 100 meters

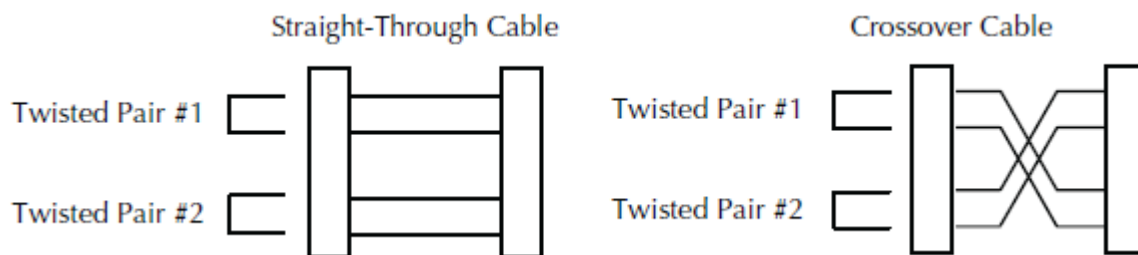
Category 3: *(Minimum requirement for 10 Mb/s operation)*

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-10x or equivalent.

Standards	IEEE Std. 802.3u, 802.3x
Data Rate	10 Mbps; 100 Mbps
Weight	1 lbs. [0.45 kg]
Power Consumption	3 watts
Max. Packet Size:	2048 bytes untagged bytes 2044 bytes tagged bytes
Filtering & Forwarding	14,880 pps for Ethernet; Rate 148,800 pps for Fast Ethernet
Dimensions	Width: 0.86" [22 mm] x Depth: 5.0" [127 mm] x Height: 3.4" [86 mm]
Power Consumption	4.0 Watts
Environment	See chassis specifications
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
MTBF	Greater than 250,000 hours (MIL-HDBK-217F) Greater than 687,500 hours (Bellcore7 V5.0)
Warranty	Lifetime

For current information on the [CBFTF10xx-10x](https://www.transition.com) see the online user guide at <https://www.transition.com>.

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

**WARNING:** Visible and invisible laser radiation when open. Do not stare into the beam or view the beam directly with optical instruments. Failure to observe this warning could result in an eye injury or blindness.

**WARNING:** 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.

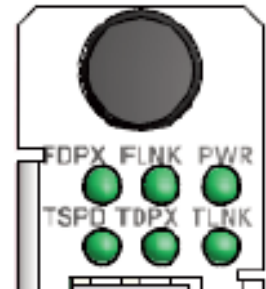
\*MTBF is estimated using the predictability method. This method is based on MIL-217F and Bellcore standards at 40°C ambient temperature, typical enclosure heat rise of 10°C, and nominal operating conditions and parameters. Installation and configuration specific MTBF estimates are available upon request. Contact Technical Support.

**CAUTION:** Copper based media ports, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are intended to be connected to intrabuilding (inside plant) link segments that are not subject to lightning transients or power faults. Copper based media ports, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are NOT to be connected to inter-building (outside plant) link segments that are subject to lightning transients or power faults. Failure to observe this caution could result in damage to equipment.

## Troubleshooting

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 **PWR** (*power*) LED lit?
  - NO
    - Is the power cord properly installed in the media converter and at the external power source?
    - Does the external power source active?
    - Contact Technical Support; see [Contact Us](#) below.
  - YES
    - Proceed to step 2.
2. Is the **TLNK** (*copper link*) LED lit?
  - NO
    - Check the copper cables for proper connection and pin assignment.
    - Contact Technical Support; see [Contact Us](#) below.
  - YES
    - Proceed to step 3.
3. Is the **FLNK** (*fiber-pair link*) LED lit?
  - 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; see [Contact Us](#) below.
  - YES
    - Proceed to step 4.
4. Is the **TPSD** (*twisted-pair speed*) LED lit?
  - 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; see [Contact Us](#) below.
  - 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 Tech Support; see [Contact Us](#) below.



## 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

### Main Office

tel: +1.952.941.7600 | toll free: 1.800.526.9267 | fax: 952.941.2322

[sales@transition.com](mailto:sales@transition.com) | [techsupport@transition.com](mailto:techsupport@transition.com) | [customerservice@transition.com](mailto:customerservice@transition.com)



### Address

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

**Web:** <https://www.transition.com>

## Compliance Information

### Declaration of Conformity

		<h3>Declaration of Conformity</h3>	
Name of Mfg:	Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.		
Model:	CBFTF 10xx-105 Series Media Converters		
Part Number(s):	CBFTF1011-105, CBFTF1012-105, CBFTF1013-105, CBFTF1014-105, CBFTF1015-105, CBFTF1016-105, CBFTF1017-105, CBFTF1019-105, CBFTF1035-105, CBFTF1039-105, CBFTF1040-105, CBFTF1029-105, CBFTF1029-106, CBFTF1029-107, CBFTF1029-108		
<p>Purpose: To declare that the CBFTF10xx-105 to which this declaration refers is in conformity with the following directive(s) standard(s): 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</p>			
<p>I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).</p>			
 Stephen Anderson, Vice-President of Engineering		October, 2010 Date	

### 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.

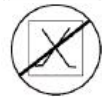
## European regulations

**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.



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 EGMitgliedstaaten 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.

## Record of Revisions

Rev	Date	Notes
A	6/5/08	Initial release.
B	11/21/08	Switch positions 2 and 3 swapped: Speed and Duplex. Added part # SBFTF1040-105
C	6/29/10	Added notes to DIP switch section. Added copper base media cautions statement to tech spec section. Added CBFTF1012-105.
D	10/14/10	Corrected link budgets on CBFTF1015, 16, 17-105.
E	10/14/16	Updated DIP switch and jumper information; updated format and contact information.

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