

## User's Guide

### CFETF1029-2xx

#### Slide-in-Module Media Converter

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

Transition Networks CFETF1029-2xx series Fast Ethernet 100Base-TX to 100Base-FX media converters connect 100Base-TX twisted-pair copper cable to single fiber 100Base-FX fiber-optic cable.

**Note:**

CFETF1029-205 and CFETF1029-206 are network installed as a local and remote pair.  
 CFETF1029-207 and CFETF1029-208 are network installed as a local and remote pair.  
 CFETF1029-209 and CFETF1029-210 are network installed as a local and remote pair.  
 CFETF1029-211 and CFETF1029-212 are network installed as a local and remote pair.

Part Number	Port One - Copper 100Base-TX	Port Two - Simplex Fiber-Optic 100Base-FX
<b>CFETF1029-205</b>	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX), 1550 (RX)** 20 km (12.4 miles)*
<b>CFETF1029-206</b>	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX), 1310 (RX)** 20 km (12.4 miles)*
<b>CFETF1029-207</b>	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX), 1550 (RX)** 40 km (24.9 miles)*
<b>CFETF1029-208</b>	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX), 1310 (RX)** 40 km (24.9 miles)*
<b>CFETF1029-209</b>	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX), 1550 (RX)** 60 km (37.3 miles)*
<b>CFETF1029-210</b>	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX), 1310 (RX)** 60 km (37.3 miles)*
<b>CFETF1029-211</b>	RJ-45 100 m (328 ft)*	SC, 1310 nm (TX), 1550 (RX)** 80 km (49.7 miles)*
<b>CFETF1029-212</b>	RJ-45 100 m (328 ft)*	SC, 1550 nm (TX), 1310 (RX)** 80 km (49.7 miles)*

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

The CFETF10xx-205 model is the duplex fiber-optic version of the media converter. For more information, see the CFETF10xx-205 user's guide on-line at: [www.transition.com](http://www.transition.com).

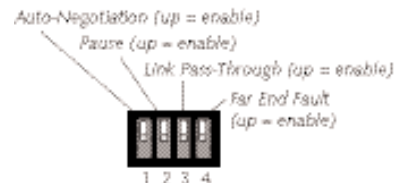
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## Installation

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when setting the 4-position switch and the jumpers. 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 circuit board.
- Use a small flat-blade screwdriver to set the recessed switches.



- Auto-Negotiation
  - up = Advertises 100 Mb/s full-duplex and half-duplex (*only during Auto-Negotiation*). See page 5.
  - down = Disables Auto-Negotiation. Operates at 100 Mb/s in the mode (*either full- or half-duplex*) of the attached device.
- Pause
  - Applies only if switch "1" is up and the media converter is connected to Auto-Negotiation device(s) capable of pause control frame.
  - up = Allows negotiation of pause control frame. See page 6.
  - down = Does not allow negotiation of pause control frame.
- Link Pass-Through
  - up = Enables Link Pass-Through. See page 6.
  - down = Disables Link Pass-Through.
- Far-End Fault
  - up = Enables Far-End Fault. See page 6.
  - down = Disables Far-End Fault.

### Set the hardware/software jumper

- The jumper is located on the circuit board (*labeled "H" and "S"*).
- Use small needle-nosed pliers or a similar device to set the jumper.
- Refer to the drawings below when setting the media converter for hardware or software mode.

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.



## Installation -- Continued

### Set the AutoCross™ jumper

When the AutoCross feature is activated, it allows either straight-through or crossover cables to be used when connecting to 100Base-TX devices. AutoCross determines the characteristics of the connection and automatically configures the unit to link up, regardless of the cable configuration.

- The jumper is located on the circuit board and is labeled "D" and "E".
- Use a small needle-nose pliers to set the recessed switches.

Disable Either straight-through or crossover twisted-pair copper cable must be installed, according to the site requirements.



Enable The media converter connects automatically to either straight-through or crossover twisted-pair copper cable.

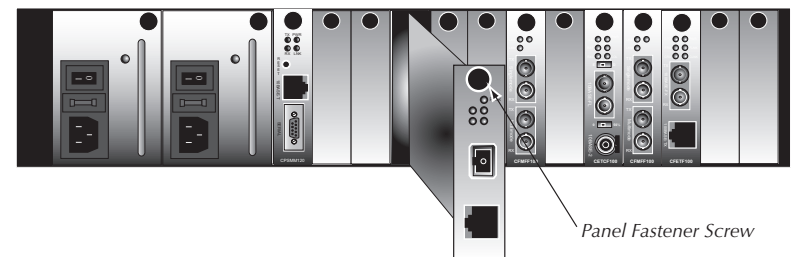


**Note:** Factory default is "enable AutoCross." Transition networks recommends leaving the device in the "enable" mode.

### Install the slide-in-module

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when installing the CFETF1029-2xx slide-in-module media converter. Failure to observe this caution could result in damage to, and subsequent failure of, the media converter.

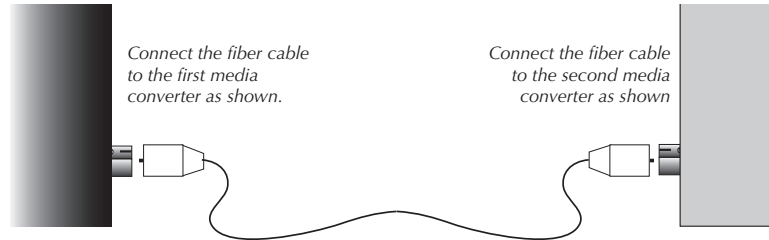
- Carefully slide the slide-in-module into the installation slot, aligning the module with the installation guides.
- Ensure that the slide-in-module is firmly seated inside the chassis.
- Push in and rotate the attached panel fastener screw clockwise to secure the module to the chassis front.



## Installation -- Continued

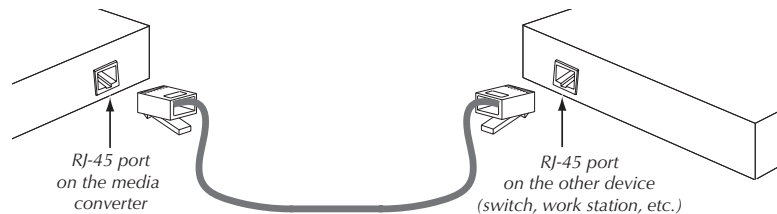
### Connect the fiber cable

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 CFETF1029-2xx media converter.
3. Connect the simplex connector at the other end of the cable to the single-strand fiber port on the second CFETF1029-2xx 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 CFETF1029-2xx 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

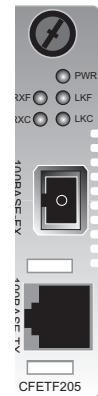
The slide-in-module media converter is powered through the Transition Networks *PointSystem*™ chassis.

## Operation

### Status LEDs

The CFETF1029-2xx media converter is designed to operate without user intervention. Use the status LEDs to monitor the media converter operation in the network.

PWR	On = Connection to external power.
LKF	On = The fiber link has been established.
LKC	On = The copper link has been established.
RXF	Flashing = The fiber link is receiving data.
RXC	Flashing = The copper link is receiving data.



### Product features

#### Auto-Negotiation

The Auto-Negotiation feature allows the CFETF1029-2xx media converter to automatically configure itself to achieve the best possible mode of operation over a link. The media converter broadcasts its speed 100 Mb/s and full or half duplex capabilities 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.

#### 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: [www.transition.com](http://www.transition.com).

## Operation -- 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 CFETF1029-2xx models.

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

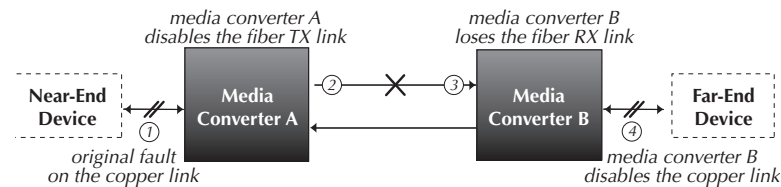
### Pause control frame

The pause control 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*).

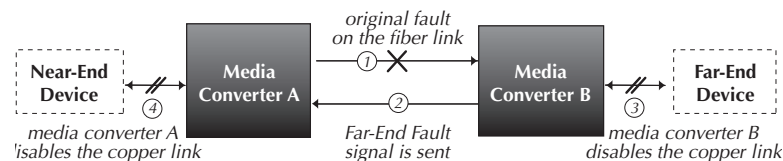
### Link Pass-Through

When the Link Pass-Through feature is activated (*see page 2*), it 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.



### 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).



## Operation -- Continued

### 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
- Copper link and fiber link status
- Twisted-pair cable length
- Hardware switch settings
- Fault condition

Also, use SNMP to enter network commands that:

- Enable/disable full- / half-duplex
- Enable/disable Link Pass-Through (LPT)
- Enable/disable Far-End Fault (FEF)
- Enable/disable pause
- Enable/disable AutoCross
- Power down the media converter

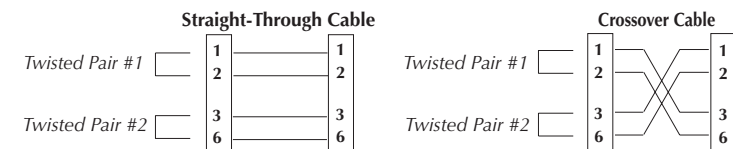
## Cable Specifications

### Copper cable

#### Category 5: (minimum requirement)

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

- Straight-through OR crossover twisted-pair cable may be used.
- Shielded twisted-pair OR unshielded twisted-pair 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.



## Cable Specifications -- Continued

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

### Fiber Cable

Bit Error Rate: <10<sup>-9</sup>  
Single mode fiber (recommended): 9 μm

#### CFETF1029-205

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

#### CFETF1029-206

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

#### CFETF1029-207

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

#### CFETF1029-208

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

#### CFETF1029-209

Fiber-optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm  
Fiber-optic Receiver Sensitivity: min: -33.0 dBm max: -3.0 dBm  
Link Budget: 28.0 dB

#### CFETF1029-210

Fiber-optic Transmitter Power: min: -6.0 dBm max: 0.0 dBm  
Fiber-optic Receiver Sensitivity: min: -33.0 dBm max: -3.0 dBm  
Link Budget: 27.0 dB

#### CFETF1029-211

Fiber-optic Transmitter Power: min: -2.0 dBm max: +3.0 dBm  
Fiber-optic Receiver Sensitivity: min: -35.0 dBm max: -3.0 dBm  
Link Budget: 33.0 dB

#### CFETF1029-212

Fiber-optic Transmitter Power: min: -3.0 dBm max: +2.0 dBm  
Fiber-optic Receiver Sensitivity: min: -35.0 dBm max: -3.0 dBm  
Link Budget: 32.0 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 Transition Networks Model CFETF1029-2xx or equivalent.

Standards:	IEEE 802.3™	
Data Rate:	100 Mb/s	
Dimensions:	3.4" x 5.0" x 0.87" (86 x 185 x 22 mm)	
Weight:	3 oz (91 g) approximate	
Power Consumption:	3.5 watts, 200 mA @ 13.9 VDC	
MTBF:	382,956 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 1,456,260 hours (Bellcore7 V5.0)	
Environment:	Tmra*:	0°C to 60°C (32°F to 140°F )
	Storage Temp:	-20°C to 85°C (-4°F 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 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 CFETF1029-2xx media converter, view the user's guide on-line at: [www.transition.com](http://www.transition.com)

This 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

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 LED on the media converter illuminated?  
NO
  - Is the media converter slide-in-module installed properly in 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: 1-800-260-1312 (Int'l: 00-1-952-7600).
 YES
  - Proceed to step 2.
  
2. Is the LKC LED on the media converter illuminated?  
NO
  - Check the twisted-pair cables for proper connection.
  - Contact Technical Support: 1-800-260-1312 (Int'l: 00-1-952-7600).
 YES
  - Proceed to step 3.
  
3. Is the LKF LED on the media converter illuminated?  
NO
  - Check the fiber cables for proper connection.
  - Contact Technical Support: 1-800-260-1312 (Int'l: 00-1-952-7600).
 YES
  - Proceed to step 4.
  
4. Is the RXC LED on the media converter flashing?  
NO
  - If there is no activity on the 100Base-TX port, proceed to step 5.
  - If there is activity on the 100Base-TX port, disconnect and reconnect the 100Base-TX cable to restart the initialization process.
  - Restart the workstation to restart the initialization process.
  - Contact Technical Support: 1-800-260-1312 (Int'l: 00-1-952-7600).
 YES
  - Proceed to step 5.
  
5. Is the RXF LED on the media converter flashing?  
NO
  - If there is no activity on the 100Base-FX port, continue below
  - If there is activity on the 100Base-FX port, disconnect and reconnect the 100Base-FX cable to restart the initialization process.
  - Restart the workstation to restart the initialization process.
  - Contact Technical Support: 1-800-260-1312 (Int'l: 00-1-952-7600).
 YES
  - Contact Technical Support: 1-800-260-1312 (Int'l: 00-1-952-7600).

## 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](http://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](http://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](mailto:techsupport@transition.com)

### Address

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telephone: 952-941-7600

toll free: 800-526-9267

fax: 952-941-2322

	<b>Declaration of Conformity</b>
Name of Mfg:	Transition Networks 6475 City West Parkway, Minneapolis MN 55344 U.S.A.
Model:	CFETF1029-2xx Series Media Converters
Part Number(s):	CFETF1029-205, CFETF1029-206, CFETF1029-207, CFETF1029-208, CFETF1029-209, CFETF1029-210, CFETF1029-211, CFETF1029-212
Regulation:	EMC Directive 89/336/EEC
Purpose:	To declare that the CFETF1029-2xx to which this declaration refers is in conformity with the following standards.
	CISPR 22:1997+A1: 2000; EN 55022:1998 A1:2000 Class A & B; EN 55024:1998; FCC Part 15 Subpart B; EN 61000-2-3:1995 A14:2000, EN 61000-3-3:1995; 21 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	July 29, 2005 Date

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# Compliance Information

CISPR22/EN55022 Class A & B + EN55024  
CE Mark

## FCC regulations

This equipment has been tested and found to comply with the limits for a Class A & B 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 & 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 A & B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.



**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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