

CFMFF13xx-28x

User's Guide

Single Mode to Multimode Retiming Media Converter

- Slide-in-Module Media Converter
- Gigabit Ethernet

Transition Networks CFMFF13xx-28x series media converters extend multimode interfaces over gigabit Ethernet fiber optic cable. The CFMFF13xx-28x is also designed to be installed into the Transition Networks PointSystem™ chassis.

Unlike most gigabit Ethernet media converters, which allow only two media converters in series, the CFMFF13xx-28x has a retiming/reshaping feature that makes it possible to connect any number of media converters in series.

Part Number	Port One - Duplex Fiber Optic 1000Base-SX	Port Two - Duplex Fiber-Optic 1000Base-LX
CFMFF1314-280	SC, 850 nm multimode 220 m (721 ft)**	SC, 1310 nm single mode 10 km (6.2 miles)
CFMFF1315-280	SC, 850 nm multimode 220 m (721 ft)**	SC, 1310 nm single mode 25 km (15.5 miles)
CFMFF1317-280	SC, 850 nm multimode 220 m (721 ft)**	SC, 1550 nm single mode 65 km (40.3 miles)
CFMFF1324-280	SC, 850 nm multimode 220 m (721 ft)**	SC, 1300 nm multimode (1000Base-SX) 2 km (1.2 miles) (62.5 / 125 mm fiber only)
CFMFF1335-280	SC, 850 nm multimode 220 m (721 ft)**	SC, 1550 nm single mode 125 km (77.5 mi)
CFMFF3535-280	SC, 1550 nm single mode 125 km (77.5 mi)	SC, 1550 nm single mode 125 km (77.5 mi)

Unless otherwise indicated, the distances listed are the typical maximum cable distance. The actual maximum cable distances are dependent upon the physical characteristics of the network installation.

- ** Minimum Cable Distance: 2 meters
 Typical Maximum Cable Distance: 220 meters for 160/500MHz•Km
 270 meters for 200/500MHz•Km

NOTE: The SFMFF13xx-28x model is the stand alone version of the media converter. For more information, see the user's guide on-line at: www.transition.com.

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Part Number	Port One - Duplex Fiber Optic 1000Base-SX	Port Two - Single Mode Fiber-Optic Single Fiber, 1000Base-LX
CFMFF1329-280	SC, 850 nm multimode 220 m (721 ft)**	SC, 1310 nm (TX)/1550 nm (RX) 20 km (12.4 miles)
CFMFF1329-281	SC, 850 nm multimode 220 m (721 ft)**	SC, 1550 nm (TX)/1310 nm (RX) 20 km (12.4 miles)
CFMFF1329-280 and CFMFF1329-281 are intended to be installed in the same network where one is the local converter and the other is the remote converter.		
CFMFF1329-282	SC, 850 nm multimode 220 m (721 ft)**	SC, 1310 nm (TX)/1550 nm (RX) 40 km (24.8 miles)
CFMFF1329-283	SC, 850 nm multimode 220 m (721 ft)**	SC, 1550 nm (TX)/1310 nm (RX) 40 km (24.8 miles)
CFMFF1329-282 and CFMFF1329-283 are intended to be installed in the same network where one is the local converter and the other is the remote converter.		
CFMFF1414-280	SC, 1310 nm single mode 10 km (6.2 miles)	SC, 1310 nm single mode 10 km (6.2 miles)

Unless otherwise indicated, the distances listed are the typical maximum cable distance. The actual maximum cable distances are dependent upon the physical characteristics of the network installation. TX = transmit, RX = receive.

** Minimum Cable Distance: 2 meters
Typical Maximum Cable Distance: 220 meters for 160/500MHz•Km
270 meters for 200/500MHz•Km

Installation

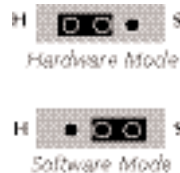
CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting the jumper, the 4-position switch, and when installing the slide-in-module. Failure to observe this caution could result in damage to, and subsequent failure of, the media converter.

Set the Hardware/Software Jumper

- The jumper is located on the circuit board.
- Use small needle-nose pliers to set the recessed switches.

Hardware The media converter mode is determined by the 4-position switch settings (see page 4).

Software The media converter mode is determined by the most-recently saved, on-board microprocessor settings. (See SNMP on page 6.)



Installation -- Continued

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.

Fiber Auto-Negotiation (Switch 1)

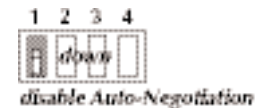
up = Enable fiber Auto-Negotiation for both the single mode and the multimode ports.

When fiber Auto-Negotiation is enabled:
The pause feature can be set using switches 3 and 4. (See page 4).



down = Disable fiber Auto-Negotiation for both the single mode and the multimode ports.

When fiber Auto-Negotiation is disabled:
Switches 3 and 4 will not function. The media converter adopts the pause setting from the end device at the other end of the fiber cable.



NOTE: All devices in the network, including the end devices, must have Auto-Negotiation enabled, or all devices must have Auto-Negotiation disabled. Otherwise, the devices in the network will not link up.

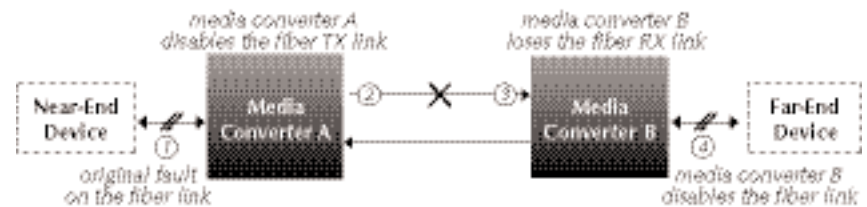


All devices must have the same Auto-Negotiation setting (all enabled or all disabled)

Link Pass-Through (Switch 2)

up = Enable Link Pass-Through.
down = Disable Link Pass-Through.

The Link Pass-Through feature allows the media converter to monitor both fiber RX (receive) ports for loss of signal. In the event of a loss of an RX signal on one media port, the media converter will automatically disable the TX (transmit) signal of the other media port, thus, "passing through" the link loss.



Installation -- Continued

Pause (Switches 3 & 4)

The pause 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.

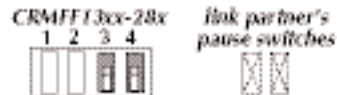
To properly set the pause feature in the network, the link partner (*i.e., the device to which the CFMFF13xx-28x is linked*) must also have comparable pause switches. If the link partner does not have the pause feature, disable the pause feature on the CFMFF13xx-28x media converter.

The CFMFF13xx-28x has four pause options (*listed below*). To the right of each option, a drawing shows the switch settings for the CFMFF13xx-28x and the link partner.



No Pause:

- Pause feature is disabled.



Transmit Only:

- CFMFF13xx-28x can transmit and the link partner can receive the pause signal.



Transmit and Receive:

- Both the CFMFF13xx-28x and the link partner can send and receive the pause signal.



Receive Only:

- The CFMFF13xx-28x can receive and the link partner can transmit the pause signal.



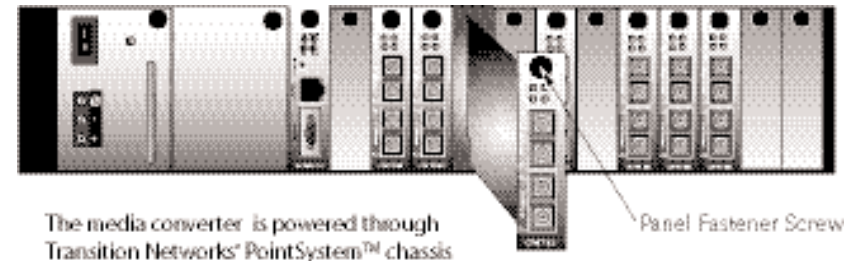
Installation -- Continued

Install the CFMFF13xx-28x Slide-in-Module

CAUTION: Slots in the PointSystem™ chassis without a slide-in-module installed **MUST** have a protective plate covering the empty slot for Class A and/or Class B compliance.

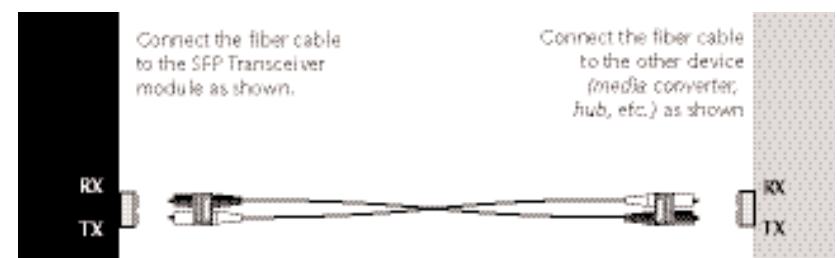
The media converter slide-in-modules may be installed in any slot, in any order. To install the CFMFF13xx-28x slide-in-module:

- Carefully slide the slide-in-module into the installation slot, aligning the module's circuit board with the installation guides.
- Ensure that the 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.



Install the Fiber Cable

- Locate or build IEEE 802.3™ compliant fiber cable with male, two-stranded TX to RX connectors installed at both ends.
- Connect the fiber cables to the CFMFF13xx-28x media converter as described:
 - Connect the male TX cable connector to the female TX port.
 - Connect the male RX cable connector to the female RX port.
- 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 the media converter operation in the network.

PWR On = Connection to external power.

LKS On = 1000Base-LX (*single mode*) fiber link is up.

LKM On = 1000Base-SX (*multimode*) fiber link is up.

ACT Flashing = Reception of data on either fiber link.



SNMP

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

- Media converter power
- Single mode fiber link status
- Multimode fiber link status
- Hardware/software mode status

Also, use SNMP to enter network commands that:

- Power up/down the media converter
- Enable/disable the single mode fiber link
- Enable/disable the multimode fiber link
- Enable/disable Auto-Negotiation
- Enable/disable Link Pass-Through
- Select pause advertisements

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

Cable Specifications

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

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
Bit error rate:	<10 ⁻¹²
Port 1:	1300 nm multimode
Fiber-optic Transmitter Power:	min: -10.0 dBm max: -4.0 dBm
Fiber-optic Receiver Sensitivity:	min: -17.0 dBm max: 0.0 dBm
Link Budget:	7.0 dB
Port 2:	1310 nm single mode
CFMFF1314-280	min: -13.0 dBm max: -3.0 dBm
Fiber-optic Transmitter Power:	min: -20.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	7.0 dB
Link Budget:	
CFMFF1315-280	1310 nm single mode
Fiber-optic Transmitter Power:	min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -20.0 dBm max: -3.0 dBm
Link Budget:	15.0 dB
CFMFF1317-280	1550 nm single mode
Fiber-optic Transmitter Power:	min: -3.0 dBm max: +2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -23.0 dBm max: -3.0 dBm
Link Budget:	20.0 dB
CFMFF1324-280	1300 nm extended multimode
Fiber-optic Transmitter Power:	min: -10.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -17.0 dBm max: -3.0 dBm
Link Budget:	7.0 db
CFMFF1329-280	1310 nm (TX) / 1550 nm (RX) single mode
Fiber-optic Transmitter Power:	min: -8.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -21.0 dBm max: -3.0 dBm
Link Budget:	13.0 dB
CFMFF1329-281	1550 nm (TX) / 1310 nm (RX) single mode
Fiber-optic Transmitter Power:	min: -8.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -21.0 dBm max: -3.0 dBm
Link Budget:	13.0 dB
CFMFF1329-282	1310 nm (TX) / 1550 nm (RX) single mode
Fiber-optic Transmitter Power:	min: -3.0 dBm max: +2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -23.0 dBm max: -8.0 dBm
Link Budget:	20.0 dB
CFMFF1329-283	1550 nm (TX) / 1310 nm (RX) single mode
Fiber-optic Transmitter Power:	min: -3.0 dBm max: +2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -23.0 dBm max: -8.0 dBm
Link Budget:	20.0 dB
CFMFF1335-280	1550 nm single mode
Fiber-optic Transmitter Power:	min: 0.0 dBm max: +5.0 dBm
Fiber-optic Receiver Sensitivity:	min: -32.0 dBm max: -3.0 dBm
Link Budget:	32.0 db

Cable Specifications -- continued

CFMFF3535-280, Ports 1 & 2	1550 nm single mode	
Fiber-optic Transmitter Power:	min: 0.0 dBm	max: +5.0 dBm
Fiber-optic Receiver Sensitivity:	min: -27.0 dBm	max: -3.0 dBm
Link Budget:	27.0 db	
CFMFF1414-280, Port 2	1310 nm single mode	
Fiber-optic Transmitter Power:	min: -13.0 dBm	max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -20.0 dBm	max: -3.0 dBm
Link Budget:	7.0 dB	

Technical Specifications

For use with Transition Networks Model CFMFF13xx-28x or equivalent

Standards:	IEEE 802.3™ 2000 (802.3z)	
Dimensions:	3.4" x 0.86" x 5.0" (86 mm x 22mm x 127mm)	
Weight	5 oz (141 g) (approximate)	
Data Rate	1000 Mb/s	
Delay Time	184 ns	
Power Consumption	3.6 watts (typical)	
Environment	Tmra*:	0°C to 50°C (32°F to 122°F)
	Storage Temp:	-15°C to 65°C (5°F to 149°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.

NOTE: Information in this user's guide is subject to change. For the most up-to-date information on the CFMFF13xx-28x 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 complies with 21 CFR1040.10 and 21CFR1040.11.

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:

- 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?
 - 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.
- Are the Auto-Negotiation switches on the network devices set such that all are set to "enable" or all are set to "disable"?
 - NO
 - Set the Auto-Negotiation switches on all of the devices (*including the end devices*) so that all are set to "enable" or all are set to "disable." (See page 3 to set the Auto-Negotiation switch on the media converter.)
 - Contact Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 3.
- Is the LKS (*link, single mode*) LED illuminated?
 - NO
 - Check the single mode 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 Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 4.
- Is the LKM (*link, multimode*) LED illuminated?
 - NO
 - Check the multimode 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 Technical Support. US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 5.

Troubleshooting -- Continued

5. Is the ACT (*fiber activity*) LED flashing?

NO

- If there is activity on the single mode fiber link, disconnect and reconnect the fiber cable on the single mode port to restart the initialization process.
- If there is activity on the multimode fiber link, disconnect and reconnect the fiber cable on the multimode port to restart the initialization process.
- If there is no activity on either fiber link, contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

YES

- Contact Tech Support: 1-800-260-1312, Int'l: 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



Declaration of Conformity

Name of Mfg: Transition Networks
6475 City West Parkway, Minneapolis MN 55344 U.S.A.

Model: CFMFF13xx-28x Series Media Converters

Part Number(s): CFMFF1314-280, CFMFF1315-280, CFMFF1317-280, CFMFF1324-280,
CFMFF1335-280, CFMFF3535-280, CFMFF1329-280, CFMFF1329-281,
CFMFF1329-282, CFMFF1329-283, CFMFF1414-280

Regulation: EMC Directive 89/336/EEC

Purpose: To declare that the CFMFF13xx-28x series and CFMFF1414-280 to which this declaration refers is in conformity with the following standards.

EN 55022:1994, A-1:1995, A-2:1997 Class A; FCC Part 15 Subpart B;
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

November 2007
Date

Compliance Information

CISPR22/EN55022 Class A

CE Mark

UL Listed

C-UL Listed

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.

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