

CFMFFxxxx-2xx User's Guide

- Slide-in-Module Media Converter
- Fast Ethernet, ATM, SONET, or Gigabit

Transition Networks CFMFFxxxx-2xx series media converters extend multimode and singlemode interfaces to singlemode fiber optic cable over Fast Ethernet, ATM, SONET, and Gigabit networks. The CFMFFxxxx-2xx is also designed to install into the Transition Networks PointSystem™ chassis.

622 Mb/s cable speed:

The models with the -21x extension are for cable speeds of 622 Mb/s and extend ATM or SONET over singlemode fiber up to 60 km.

| Part Number | Port One - Fiber-Optic | Port Two - Fiber-Optic |
|----------------------|---|---|
| CFMFF1314-210 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1310 nm singlemode 15 km (9.3 miles) |
| CFMFF1316-210 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1310 nm singlemode 40 km (24.8 miles) |
| CFMFF1317-210 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1550 nm singlemode 60 km (37.2 miles) |
| CFMFF1717-210 | SC, 1550 nm singlemode 60 km (37.2 miles) | SC, 1550 nm singlemode 60 km (37.2 miles) |
| CFMFF1329-210 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1329-211 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1329-212 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 40 km (24.8 mi) |
| CFMFF1329-213 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 40 km (24.8 mi) |
| CFMFF1429-210 | SC, 1310 nm singlemode duplex, 15 km (9.3 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1429-211 | SC, 1310 nm singlemode duplex, 15 km (9.3 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1429-212 | SC, 1310 nm singlemode duplex, 15 km (9.3 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 40 km (24.8 mi) |
| CFMFF1429-213 | SC, 1310 nm singlemode duplex, 15 km (9.3 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 40 km (24.8 mi) |

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155 Mb/s cable speed:

The models with the -20x extension are for cable speeds of 155 Mb/s and extend ATM or Fast Ethernet over singlemode fiber up to 80 km.

| Part Number | Port One - Fiber-Optic | Port Two - Fiber-Optic |
|----------------------|--|---|
| CFMFF1313-200 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1300 nm multimode 2 km (1.2 miles) |
| CFMFF1314-200 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1310 nm singlemode 20 km (12.4 miles) |
| CFMFF1315-200 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1310 nm singlemode 40 km (24.8 miles) |
| CFMFF1316-200 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1310 nm singlemode 60 km (37.2 miles) |
| CFMFF1317-200 | SC, 1300 nm multimode 2 km (1.2 miles) | SC, 1550 nm singlemode 80 km (49.7 miles) |
| CFMFF1414-200 | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) |
| CFMFF1415-200 | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) | SC, 1310 nm singlemode 40 km (24.8 miles) |
| CFMFF1329-200 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1329-201 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1329-202 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 40 km (24.8 mi) |
| CFMFF1329-203 | SC, 1300 nm multimode duplex, 2 km (1.2 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 40 km (24.8 mi) |
| CFMFF1429-200 | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1429-201 | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1429-202 | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 40 km (24.8 mi) |
| CFMFF1429-203 | SC, 1310 nm singlemode duplex, 20 km (12.4 miles) | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 40 km (24.8 mi) |

The cable distances listed are typically maximum. The actual maximum cable distances are dependent upon the physical characteristics of the network installation.

SM = singlemode, TX = transmit, RX = receive.

1.25 Gb/s cable speed:

The models with the -22x extensions are for cable speeds of 1.2Gb/s and can extend gigabit Ethernet over a singlemode fiber up to 125 km.

| Part Number | Port One – Fiber Optic | Port Two – Fiber-Optic |
|----------------------|---|---|
| CFMFF1313-220 | SC, 850 nm multimode 220 m (721 ft)** | SC, 850 nm multimode 220 m (721 ft)** |
| CFMFF1314-220 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1310 nm singlemode 10 km (6.2 miles) |
| CFMFF1315-220 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1310 nm singlemode 25 km (15.5 miles) |
| CFMFF1317-220 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1550 nm singlemode 65 km (40.3 miles) |
| CFMFF1324-220 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1300 nm extended MM up to 2 km (1.2 miles) (62.5/125 mm fiber only) |
| CFMFF1335-220 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1550 nm singlemode 125 km (77.5 mi) |
| CFMFF1414-220 | SC, 1310 nm singlemode 10 km (6.2 miles) | SC, 1310 nm singlemode 10 km (6.2 miles) |
| CFMFF1424-220 | SC, 1310 nm singlemode 10 km (6.2 miles) | SC, 1300 nm extended MM up to 2 km (1.2 miles) (62.5/125 mm fiber only) |
| CFMFF1429-220 | SC, 1310 nm singlemode 10 km (6.2 miles) | SC, 1310 nm (TX)1550 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1825-220 | MJ-RJ, 850 nm multimode 220 m (721 ft) | MJ-RJ, 1310 nm singlemode 10 km (6.2 miles) |
| CFMFF1329-220 | SC, 850 nm duplex MM 220 m (721 ft)** | SC, 1310 nm (TX)/1550 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1329-221 | SC, 850 nm duplex MM 220 m (721 ft)** | SC, 1550 nm (TX)/1310 nm (RX) SM single fiber, 20 km (12.4 mi) |
| CFMFF1329-222 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1310 nm (TX)/1550 nm (RX) SM SF, 40 km (24.9 miles) |
| CFMFF1329-223 | SC, 850 nm multimode 220 m (721 ft)** | SC, 1310 nm (TX)/1550 nm (RX) SM SF, 40 km (24.9 miles) |

SM = singlemode, MM = multimode, TX = transmit, RX = receive.

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

Installation

Install these Models in Pairs

The following media converter pairs are to be installed in the same network, where one serves as the local converter and the other a remote converter (*either converter can be installed in either location*).

155 Mb/s network:

- CFMFF1329-200 and CFMFF1329-201
- CFMFF1329-202 and CFMFF1329-203
- CFMFF1429-200 and CFMFF1429-201
- CFMFF1429-202 and CFMFF1429-203

622 Mb/s network:

- CFMFF1329-210 and CFMFF1329-211
- CFMFF1329-212 and CFMFF1329-213
- CFMFF1429-210 and CFMFF1429-211
- CFMFF1429-212 and CFMFF1429-213

1.2 GB/s network:

- CFMFF1329-220 and CFMFF1329-221
- CFMFF1329-222 and CFMFF1329-223

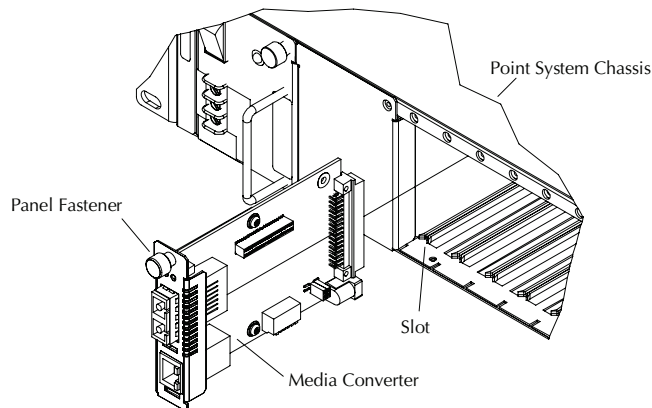
Install Slide-in-module in PointSystem™ chassis

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

The media converter slide-in-modules may be installed in any slot, in any order.

To install the slide-in-module:

1. Carefully slide the slide-in-module into the slot, aligning the module's circuit board with the slot guides.
2. Ensure that the module is firmly seated in the chassis slot.
3. Secure the module by pushing its fastener in and turning it clockwise.

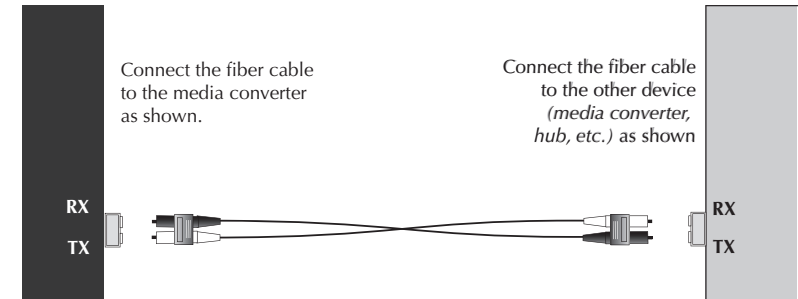


Installation – Continued

Install the fiber cable

CAUTION: Both connections (*Port 1 and Port 2*) to the CFMFFxxxx-2xx media converter must be the same network speed and network protocol. Failure to observe this caution could cause data transfers to fail.

1. Locate or build IEEE 802.3™ compliant fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the CFMFFxxxx-2xx 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.
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.



Power the Media Converter

The media converter is powered through the Transition Networks PointSystem™ chassis.

Delay Times

Network worst-case delay through the CFMFFxxxx-2xx converter:

| | |
|---------------------|--------|
| 623 Mbps – 1 Gbps | 1 nsec |
| 156 Mbps – 622 Mbps | 2 nsec |
| 125-155 Mbps | 3 nsec |
| <125 Mbps | 7 nsec |

For example, in Ethernet environments, ensure that the network conforms to the 512-bit Rule by using the above numbers to determine the 'bit-time' delay, as:

$$125 \text{ Mbps Ethernet: } \frac{3 \text{ nsec}}{(1/125\text{Mbps})} = \frac{3 \text{ nsec}}{8 \text{ nsec}} = -0.4 \text{ bit times}$$

Operation

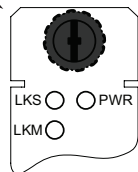
Status LEDs

Use the three status LEDs on the media converter (shown here) to monitor its operation in the network.

PWR ON = Connection to external power.

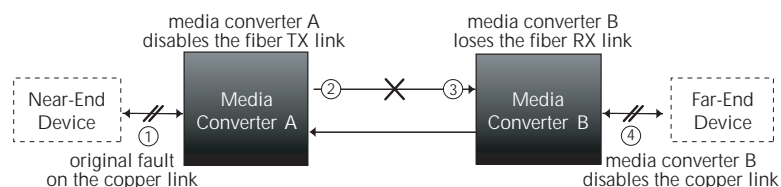
LKS ON = Singlemode fiber link is up.

LKM ON = Multimode fiber link is up.



Link Pass-Through

The Link Pass-Through feature allows the media converter to monitor 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.



SNMP

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

- Media converter power
- Singlemode fiber link status
- Multimode fiber link status

Also, use SNMP to enter network commands that:

- Power down the media converter
- Disable the multimode transmitter
- Disable the singlemode transmitter

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.

| | |
|---------------------------------|----------------------------|
| Singlemode fiber (recommended): | 9 μm |
| Multimode fiber (recommended): | 62.5/125 μm |
| Multimode fiber (optional): | 100/140, 85/140, 50/125 μm |

155 Mb/s fiber specifications (CFMFF13xx-20x)

| | |
|-----------------------------------|-------------------------------|
| Bit Error Rate: | <10 ⁻⁹ |
| Port 1: | 1300 nm multimode duplex |
| 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 |

| | |
|-----------------------------------|-------------------------------|
| Port 2: | 1300 nm multimode duplex |
| CFMFF1313-200 | |
| 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 |

| | |
|-----------------------------------|------------------------------|
| CFMFF1314-200 | 1310 nm singlemode |
| 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 |

| | |
|-----------------------------------|------------------------------|
| CFMFF1315-200 | 1310 nm singlemode |
| 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 |

| | |
|-----------------------------------|------------------------------|
| CFMFF1316-200 | 1310 nm singlemode |
| Fiber-optic Transmitter Power: | min: -5.0 dBm max: 0.0 dBm |
| Fiber-optic Receiver Sensitivity: | min: -34.0 dBm max: -7.0 dBm |
| Link Budget: | 29.0 dB |

| | |
|-----------------------------------|------------------------------|
| CFMFF1317-200 | 1550 nm singlemode |
| Fiber-optic Transmitter Power: | min: -5.0 dBm max: 0.0 dBm |
| Fiber-optic Receiver Sensitivity: | min: -34.0 dBm max: -7.0 dBm |
| Link Budget: | 29.0 dB |

| | |
|-----------------------------------|--|
| CFMFF1329-200 | 1310 nm (TX) / 1550 nm (RX) singlemode |
| 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 |

| | |
|-----------------------------------|--|
| CFMFF1329-201 | 1550 nm (TX) / 1310 nm (RX) singlemode |
| 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 |

| | |
|-----------------------------------|--|
| CFMFF1329-202 | 1310 nm (TX) / 1550 nm (RX) singlemode |
| 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 |

| | |
|-----------------------------------|--|
| CFMFF1329-203 | 1550 nm (TX) / 1310 nm (RX) singlemode |
| 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 |

Cable Specifications – Continued

155 Mb/s fiber specifications (CFMFF14xx-20x)

Bit Error Rate: <10⁻⁹

Port 1:
 1310 nm singlemode duplex
 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

Port 2:
CFMFF1414-200
 1310 nm singlemode duplex
 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

CFMFF1415-200
 1310 nm singlemode
 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

CFMFF1429-200
 1310 nm (TX) / 1550 nm (RX) singlemode
 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

CFMFF1429-201
 1550 nm (TX) / 1310 nm (RX) singlemode
 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

CFMFF1429-202
 1310 nm (TX) / 1550 nm (RX) singlemode
 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

CFMFF1429-203
 1550 nm (TX) / 1310 nm (RX) singlemode
 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

Cable Specifications – Continued

622 Mb/s fiber specifications (CFMFF13xx-21x)

Bit Error Rate: <10⁻⁹

Port 1:
 1300 nm multimode duplex
 Fiber-optic Transmitter Power: min: -19.0 dBm max: -14.0 dBm
 Fiber-optic Receiver Sensitivity: min: -26.0 dBm max: -14.0 dBm
 Link Budget: 7.0 dB

Port 2:
CFMFF1314-210
 1310 nm singlemode
 Fiber-optic Transmitter Power: min: -15.0 dBm max: -8.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -7.0 dBm
 Link Budget: 13.0 dB

CFMFF1316-210
 1310 nm singlemode
 Fiber-optic Transmitter Power: min: -3.0 dBm max: +2.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -7.0 dBm
 Link Budget: 25.0 dB

CFMFF1317-210
 1550 nm singlemode
 Fiber-optic Transmitter Power: min: -3.0 dBm max: +2.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -7.0 dBm
 Link Budget: 25.0 dB

CFMFF1329-210
 1310 nm (TX) / 1550 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -14.0 dBm max: -8.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 14.0 dB

CFMFF1329-211
 1550 nm (TX) / 1310 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -14.0 dBm max: -8.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 14.0 dB

CFMFF1329-212
 1310 nm (TX) / 1550 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 23.0 dB

CFMFF1329-213
 1550 nm (TX) / 1310 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -6.0 dBm max: 0.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 22.0 dB

Cable Specifications – Continued

622 Mb/s fiber specifications (CFMFF14xx-21x)

Bit Error Rate: <10⁻⁹

Port 1:
 1310 nm singlemode
 Fiber-optic Transmitter Power: min: -15.0 dBm max: -8.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -7.0 dBm
 Link Budget: 13.0 dB

Port 2:
CFMFF1429-210 1310 nm (TX) / 1550 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -14.0 dBm max: -8.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 14.0 dB

CFMFF1429-211 1550 nm (TX) / 1310 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -14.0 dBm max: -8.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 14.0 dB

CFMFF1429-212 1310 nm (TX) / 1550 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 23.0 dB

CFMFF1429-213 1550 nm (TX) / 1310 nm (RX) singlemode
 Fiber-optic Transmitter Power: min: -6.0 dBm max: 0.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -8.0 dBm
 Link Budget: 22.0 dB

622 Mb/s Fiber Specifications (CFMFF1717-210)

Bit Error Rate: <10⁻⁹

Port 1
 1310 nm singlemode
 Fiber-optic Transmitter Power: min: -3.0 dBm max: +2.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -7.0 dBm
 Link Budget: 25.0 dB

Port 2
 1310 nm singlemode
 Fiber-optic Transmitter Power: min: -3.0 dBm max: +2.0 dBm
 Fiber-optic Receiver Sensitivity: min: -28.0 dBm max: -7.0 dBm
 Link Budget: 25.0 dB

Cable Specifications – Continued

1.25 Gb/s fiber specifications (CFMFF13xx-22x)

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:
CFMFF1313-220 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

CFMFF1314-220 1310 nm singlemode
 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

CFMFF1315-220 1310 nm singlemode
 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 / Spectral Width: 15.0 dB / 5.9 nm FWHM

CFMFF1317-220 1550 nm singlemode
 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 / Spectral Width: 20.0 dB / 2.3 nm FWHM

CFMFF1324-220 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

CFMFF1329-220 1310 nm (TX) / 1550 nm (RX) singlemode
 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

CFMFF1329-221 1550 nm (TX) / 1310 nm (RX) singlemode
 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

CFMFF1329-222 1550 nm (TX) / 1310 nm (RX) singlemode
 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

CFMFF1329-223 1550 nm (TX) / 1310 nm (RX) singlemode
 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

CFMFF1335-220 1550 nm singlemode
 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 / Spectral Width: 27.0 dB / 0.3 nm FWHM

Cable Specifications – Continued

1.25 Gb/s fiber specifications (CFMFF14xx-22x)

Bit error rate: <10-12

Port 1:

CFMFF1414-220

Fiber-optic Transmitter Power: 1310 nm singlemode
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

Port 2:

CFMFF1414-220

Fiber-optic Transmitter Power: 1310 nm singlemode
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

Port 1:

CFMFF1424-220

Fiber-optic Transmitter Power: 1310 nm singlemode
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

Port 2:

CFMFF1424-220

Fiber-optic Transmitter Power: 1300 nm extended multimode
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

Port 1:

CFMFF1429-220

Fiber-optic Transmitter Power: 1310 nm singlemode
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

Port 2:

CFMFF1429-220

Fiber-optic Transmitter Power: 1310 nm singlemode
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

1.25 Gb/s Fiber Specifications (CFMFF1825-220)

Bit error rate: <10-12

Port 1:

Fiber-optic Transmitter Power: 850 nm multimode
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:

Fiber-optic Transmitter Power: 1310 nm singlemode
min: -11.0 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity: min: -20.0 dBm max: -3.0 dBm
Link Budget/Spectral Width: 9.0 db/7.0 nm FWHM

Technical Specifications

Applies to Transition Networks Model CFMFFxxxx-2xx or equivalent

| | |
|--------------------|--|
| Standards: | IEEE 802.3™ 1998 Fast Ethernet, ATM, OC-3, STM-1, HSTR, FDDI |
| Dimensions: | 3.4" x 0.86" x 5.0" (86 mm x 22mm x 127mm) |
| Weight: | 3 oz (91 g) (approximate) |
| MTBF: | 650,318 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 1,793,425 hours (Bellcore7 V5.0) |
| Delay: | 623 Mbps -1 Gbps: 1 nsec 156 Mbps - 622 Mbps: 2 nsec 125-155 Mbps: 3 nsec <125 Mbps: 7 nsec |
| Power Consumption: | 3.0 watts (typical) |
| Environment: | Tmra*: 0°C to 50°C (32°F to 122°F) Storage Temp: -20°C to 85°C (-4°F 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.

Note: The CFMFFxxxx-2xx media converters are for use in Transition Networks' model CPSMCxxxx-xxx chassis only. See the CPSMCxxxx-xx chassis manuals, available on-line @ www.transition.com, for information about the chassis.

Note: For the most up-to-date information on the CFMFFxxxx-2xx media converter, view the user's guide on-line @ www.transition.com

Note: The SFMFFxxxx-2xx model is the stand alone version of the media converter. For more information, see the user's guide on-line at: www.transition.com.

The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC-825/CDRH standards and complies with 21 CFR 1040.10 and 21CFR 1040.11.

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.

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 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: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - Proceed to step 2.

2. Is the LKS (*link singlemode*) LED illuminated?
 - NO
 - Check the singlemode 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 3.

3. 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.
 - Restart the workstation to restart the initialization process.
 - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 - YES
 - 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


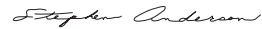
Transition Networks provides seminars via live web-based training. Log onto www.transition.com and click the Learning Center link.

E-Mail

Ask a question anytime by sending an e-mail to our technical support staff. techsupport@transition.com

Address

Transition Networks
 10900 Red Circle Drive Minnetonka, MN 55343, U.S.A.
 telephone: 952-941-7600
 toll free: 800-526-9267
 fax: 952-941-2322

|  Declaration of Conformity | |
|--|---|
| Name of Mfg: | Transition Networks 10900 Red Circle Drive, Minnetonka MN 55344 U.S.A. |
| Model: | CFMFFxxxx-2xx Series Media Converters |
| Part Number(s): | CFMFF1313-200, CFMFF1314-200, CFMFF1314-210, CFMFF1313-220, CFMFF1314-220, CFMFF1315-200, CFMFF1315-220, CFMFF1316-200, CFMFF1316-210, CFMFF1317-200, CFMFF1317-210, CFMFF1317-220, CFMFF1717-210, CFMFF1329-200, CFMFF1329-201, CFMFF1329-202, CFMFF1329-203, CFMFF1329-210, CFMFF1329-211, CFMFF1329-212, CFMFF1329-213, CFMFF1329-220, CFMFF1329-221, CFMFF1329-222, CFMFF1329-223, CFMFF1414-200, CFMFF1415-200, CFMFF1429-200, CFMFF1429-201, CFMFF1429-202, CFMFF1429-203, CFMFF1429-210, CFMFF1429-211, CFMFF1429-212, CFMFF1429-213, CFMFF1324-220, CFMFF1825-220, CFMFF1335-220, CFMFF1414-220, CFMFF1424-220, CFMFF1429-220 |
| Regulation: | EMC Directive 89/336/EEC |
| Purpose: | To declare that the CFMFFxxxx-2xx to which this declaration refers is in conformity with the following standard(s) and directive(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 |
| 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 | August, 2011_____ Date |

Compliance Information

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.



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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