

OC12 ATM / SONET / SDH

Single Mode to Multimode Fiber

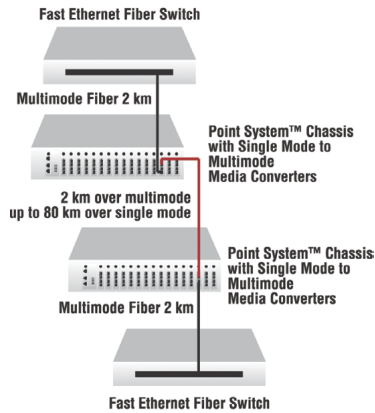
Point System™ Slide-In-Module Media Converters

CFMFF1xxx-21x



Convert Single Mode to Multimode

Extend Network Distance



Extend Network Distance

Convert multimode 622 Mbps interfaces to single mode fiber on a port-by-port basis and extend ATM or SONET over single mode fiber up to 60 km.

Features

- ▶ OC-12 over SONET/SDH or ATM
- ▶ Link Pass Through *see next page*
- ▶ Automatic Link Restoration *next page*
- ▶ Remote Firmware Upgrade *next page*
- ▶ Protocol Transparency
- ▶ Card manageability:
 - Multimode/Single Mode signal detect
 - Hardware/software mode
 - Fiber port enable/disable multimode
 - Fiber port enable/disable single mode
- ▶ Can be used with any Point System™ Chassis

Specifications

Standards	IEEE Std 802.3™
Fiber Optic Connector Specs	
Multimode	
	Min TX PWR: -19.0 dBm Max TX PWR: -14.0 dBm RX Sensitivity: -26.0 dBm Max In PWR: -14.0 dBm Link Budget: 7.0 dB
Single Mode	
CFMFF1314-210	Min TX PWR: -15.0 dBm Max TX PWR: -8.0 dBm RX Sensitivity: -28.0 dBm Max In PWR: -7.0 dBm Link Budget: 13.0 dB
CFMFF1316-210 & CFMFF1317-210	Min TX PWR: -3.0 dBm Max TX PWR: -2.0 dBm RX Sensitivity: -29.0 dBm Max In PWR: -7.0 dBm Link Budget: 26.0 dB
Single Fiber Products	
CFMFF1x29-210 & CFMFF1x29-211	Min TX PWR: -14.0 dBm Max TX PWR: -8.0 dBm RX Sensitivity: -28.0 dBm Max In PWR: -8.0 dBm Link Budget: 14.0 dB
CFMFF1x29-212	Min TX PWR: -5.0 dBm Max TX PWR: 0.0 dBm RX Sensitivity: -28.0 dBm Max In PWR: -8.0 dBm Link Budget: 23.0 dB
CFMFF1x29-213	Min TX PWR: -6.0 dBm Max TX PWR: 0.0 dBm RX Sensitivity: -28.0 dBm Max In PWR: -8.0 dBm Link Budget: 22.0 dB
3-position Jumper	Hardware: Software mode disabled. Software: Converter mode is determined by most recently saved on-board microprocessor settings.
Status LEDs	PWR (Power): Steady green LED indicates connection to external AC power LKS (Single mode fiber link): Steady LED indicates single mode fiber link LKM (Multimode fiber link): Steady LED indicates multimode fiber link
Dimensions	Width: 0.86" [22 mm] Depth: 5.0" [127 mm] Height: 3.4" [86 mm]
Power Consumption	3.5 watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Compliance	UL Listed; C-UL Listed (Canada); CISPR/EN55022 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Info

Product Number	Port One	Port Two
CFMFF1314-210	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps fiber optic 1310nm single mode (SC) [15 km/9.3 miles]
CFMFF1316-210	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps fiber optic 1310nm single mode (SC) [40 km / 24.9 miles]
CFMFF1317-210	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps fiber optic 1550nm single mode (SC) [60 km / 37.3 miles]
Single Fiber Products <i>Note: Recommended use in pairs (see next page)</i>		
CFMFF1329-210	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps 1310nm TX / 1550nm RX single fiber single mode (SC) [20 km / 12.4 miles]
CFMFF1329-211	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps 1550nm TX / 1310nm RX single fiber single mode (SC) [20 km / 12.4 miles]
CFMFF1329-212	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps 1310nm TX / 1550nm RX single fiber single mode (SC) [40 km / 24.9 miles]

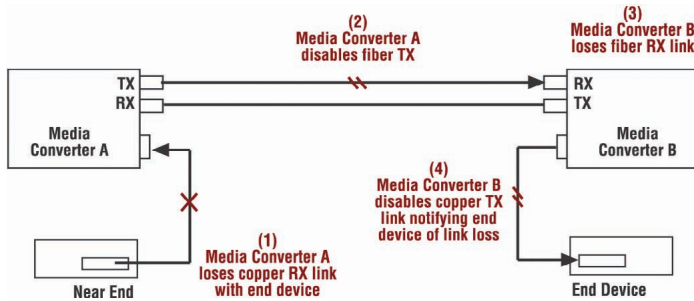
Product Number	Port One	Port Two
Single Fiber Products (continued) <i>Note: Recommended use in pairs (see next page)</i>		
CFMFF1329-213	622 Mbps fiber optic 1300nm multimode (SC) [2 km/1.2 miles]	622 Mbps 1550nm TX / 1310nm RX single fiber single mode (SC) [40 km / 24.9 miles]
CFMFF1429-210	622 Mbps fiber optic 1310nm single mode (SC) [15 km/9.3 miles]	622 Mbps 1310nm TX / 1550nm RX single fiber single mode (SC) [20 km / 12.4 miles]
CFMFF1429-211	622 Mbps fiber optic 1310nm single mode (SC) [15 km/9.3 miles]	622 Mbps 1550nm TX / 1310nm RX single fiber single mode (SC) [20 km / 12.4 miles]
CFMFF1429-212	622 Mbps fiber optic 1310nm single mode (SC) [15 km/9.3 miles]	622 Mbps 1310nm TX / 1550nm RX single fiber single mode (SC) [40 km / 24.9 miles]
CFMFF1429-213	622 Mbps fiber optic 1310nm single mode (SC) [15 km/9.3 miles]	622 Mbps 1550nm TX / 1310nm RX single fiber single mode (SC) [40 km / 24.9 miles]

ADVANCED PRODUCT FEATURES

▶ Link Pass Through

Link Pass Through is a troubleshooting feature that allows the media converter to monitor both the fiber and copper RX ports for loss of signal. In the event of a loss of RX signal on one media port, the converter will automatically disable the TX signal of the other media port, thus "passing through" the link loss. (see diagram below)

- ▶ End device automatically notified of link loss
- ▶ Prevents loss of valuable data unknowingly transmitted over invalid link



▶ Automatic Link Restoration

Transition Networks's converters will automatically re-establish link in all network conditions.

- ▶ No need to reset devices

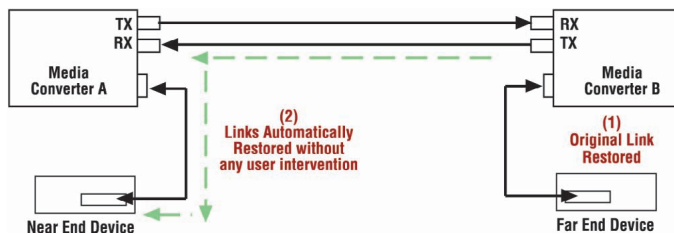
Transition Networks's converters will automatically re-establish link when connected to switches if link was lost. With other manufacturers' converters the user must reset the converter to re-establish the link.

- ▶ Auto-Negotiation Enabled

Automatic Link Restoration allows the users to continue using Auto-Negotiation with Link Loss Notification features. With other manufacturers' converters the user must disable Auto-Negotiation and hard set the link.

- ▶ Link Pass Through Activated in both directions

Automatic Link Restoration on Transition Networks's products allows users to continue using Link Loss Notification feature activated in both directions. Many competitive solutions allow for Link Loss Notification activation only in one direction. If Link Loss feature is activated in both directions, competitive products are put in a "deadly embrace" and they cannot restore the link without resetting the converters.



▶ Remote Firmware Upgrade

New product features are continuously being added to Transition Networks's products. These improvements are also available for many products already installed in the field. Management modules and many media converters can be updated remotely via firmware upgrade. The remote upgrade feature eliminates the need to ship the products back to the manufacturer. The firmware upgrades can be performed by a user either locally via a Console port or remotely via TFTP.

The upgrades do not require the reconfiguration of the SNMP management or converter feature settings.

If someone tells you media conversion is a commodity product that anyone can bring to market, they probably haven't looked at the extensive product suite offered by Transition Networks. With the industry's most comprehensive offering of full-featured products, Transition's media converters stand out as "the choice" among industry IT professionals.

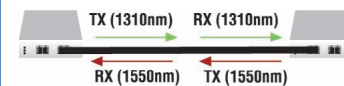
Generally, media converters are low-level OSI model devices with no IP or MAC addresses and therefore are transparent to the network. This "transparency" makes them very inexpensive and easy to use, but also can make troubleshooting the network very difficult. In an effort to overcome this difficulty and to make media converters "visible" to network managers, Transition has designed their full-featured products to include the most advanced features on the market today.

▶ Single Fiber

Single fiber technology offers a 50% savings in fiber utilization. It is an attractive solution to maximize the usage of a limited number of fiber runs.

In a traditional optical link, a fiber pair consists of two uni-directional strands. The single fiber technology multiplexes two optical wavelengths of 1310nm and 1550nm into a single strand fiber. In a single fiber media converter each wavelength is responsible for either the transmit or receive function. Consequently, the bi-directional transmission is achieved by using a single strand. The converters in a single fiber scenario "match" each other's wavelengths. Converter A transmits at the wavelength of 1310nm and receives at 1550nm while the other converter transmits at 1550nm and receives at 1310nm. Therefore, converters are usually used in pairs.

Single Fiber



Single fiber technology is available on all Transition Networks Media Converters in maximum distance ranges from 20 to 80km.