

## Gigabit Ethernet Media Converter



► Migrate to Gigabit Ethernet in a cost-effective manner. Used in conjunction with lower cost 1000BASE-T switches, companies can take advantage of the high bandwidth Gigabit Ethernet offers without all of the higher costs.

Transition Networks's 1000BASE-T to SX/LX converters allow users to extend the bandwidth to those users outside the reach of the 1000BASE-T standard (**up to 125 km**).

## Features

- Copper & Fiber Auto-Negotiation *see next pages*
- Transparent Link Pass Through *see next pages*
- Automatic Link Restoration *see next pages*
- Remote Fault Detect
- Loopback *see next pages*
- Pause *see next pages*
- Remote Firmware Upgrade *see next pages*
- DMI - Diagnostic Monitoring Interface *supported on CGETF1040-110 when an SFP supporting DMI is used.*

DMI models have four functions:

- Transmit Power
- Receive Power
- Transmit bias current
- Temperature

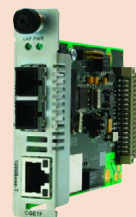
Within each function, the device will send a trap (*i.e. error*) whenever a high or low warning event or a high or low alarm event occurs (*for a total of 16 traps*).

## Specifications

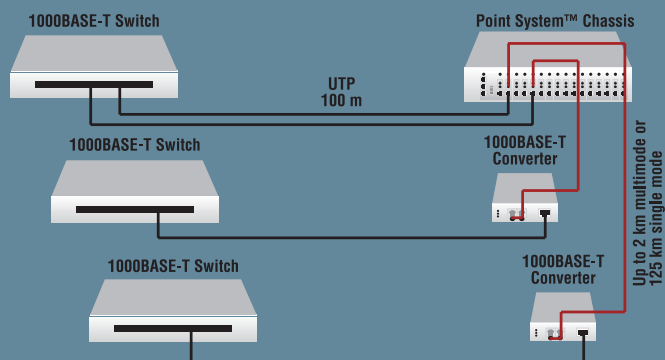
See next page for complete fiber optic connector specs.

Standards	IEEE Std. 802.3ab™ and IEEE Std. 802.3™
6-position Switch	<b>SW1:</b> Remote Fiber Fault Detect (Down=Enabled) <b>SW2:</b> Symmetric Pause <b>SW3:</b> Asymmetric Pause <b>SW4:</b> Transparent Link Pass Through (UP=Enabled) <b>SW5:</b> Fiber Auto-Negotiation (Down=Enabled) <b>SW6:</b> Loopback (Down=Enabled)
3-position Jumper	<b>Hardware:</b> Converter mode is determined by 6-position switch settings <b>Software:</b> Converter mode is determined by most recently saved on-board microprocessor settings.
Status LEDs	<b>PWR (Power):</b> ON=connection to external AC power <b>LKF (Fiber Link):</b> ON=fiber connection <b>RXC (Copper Receive):</b> Flashing=Receiving data on copper link; ON=Copper Link connection <b>Duplex:</b> ON=Copper Link connection
Dimensions	<b>Width:</b> 0.86" [22 mm] <b>Depth:</b> 5.0" [127 mm] <b>Height:</b> 3.4" [86 mm]
Power Consumption	5.4 watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A + EN55024; FCC Class A; CE Mark
Warranty	Lifetime

## CGETF10xx-11x



## Migrate to Gigabit Ethernet



## Ordering Info

See next page for complete fiber optic connector specs.

**CGETF1013-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-SX 850nm multimode (SC)  
[62.5/125µm fiber: 220 m/722 ft.]  
Link Budget: 7.0 dB  
[50/125µm fiber: 550 m / 1804 ft.]  
Link Budget: 7.0 dB

**CGETF1024-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1310nm Extended MM  
(62.5/125µm fiber only) (SC)  
[2 km/1.2 mi.] Link Budget: 7.0 dB

**CGETF1014-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1310nm SM (SC)  
[10 km/6.2 mi.] Link Budget: 7.0 dB

**CGETF1015-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1310nm SM (SC)  
[25 km/15.5 mi.] Link Budget: 15.0 dB

**CGETF1017-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1550nm SM (SC)  
[65 km/40.4 mi.] Link Budget: 21.0 dB

**CGETF1035-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1550nm SM (SC)  
[125 km/77.7 mi.] Link Budget: 27.0 dB

**CGETF1040-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-X SFP Slot (empty)

## Single Fiber Products

Recommended use in pairs

**CGETF1029-110**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1310nm TX / 1550nm  
RX single fiber single mode (SC)  
[20 km/12.4 mi.] Link Budget: 13.0 dB

**CGETF1029-111**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1550nm TX / 1310nm  
RX single fiber single mode (SC)  
[20 km/12.4 mi.] Link Budget: 13.0 dB

**CGETF1029-112**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1310nm TX / 1550nm  
RX single fiber single mode (SC)  
[40 km/24.9 mi.] Link Budget: 20.0 dB

**CGETF1029-113**  
1000BASE-T (RJ-45) [100 m/328 ft.]  
to 1000BASE-LX 1550nm TX / 1310nm  
RX single fiber single mode (SC)  
[40 km/24.9 mi.] Link Budget: 20.0 dB

## Gigabit Ethernet Media Converter: Fiber Optic Connector Specs

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget
CGETF1013-110	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB
CGETF1018-110	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB
CGETF1024-110	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB
CGETF1014-110	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB
CGETF1015-110	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB
CGETF1017-110	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB
CGETF1035-110	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB
CGETF1029-110	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB
CGETF1029-111	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB
CGETF1029-112	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB
CGETF1029-113	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB

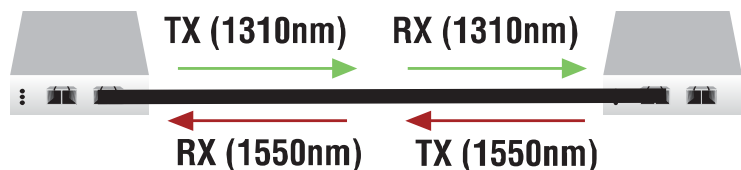


### ► Single Fiber

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



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.



## ▶ Auto-Negotiation (802.3u)

Auto-Negotiation allows devices to perform automatic configuration to achieve the best possible mode of operation over a link. Devices with this feature will broadcast their speed (10Mbps, 100Mbps, etc.) and duplex (half/full) capabilities to other devices and negotiate the best mode of operation between the two devices.

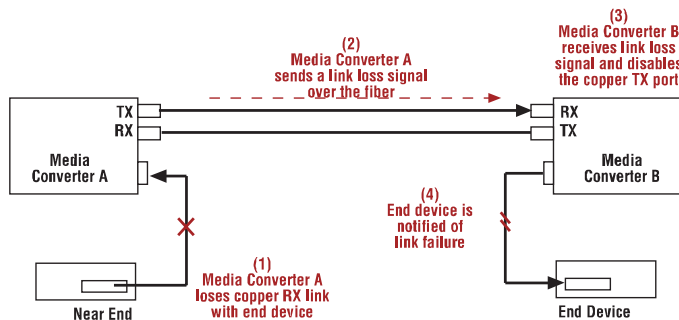
- ▶ No user intervention required to determine best mode of operation
- ▶ Optimal link established automatically
- ▶ Quick and easy installation

While the inclusion of this feature is beneficial, the ability to disable it is equally beneficial. In the event of a non-negotiating end device trying to connect to a negotiating device, the mode of operation will drop to the least common denominator between the two devices (i.e. 100Mbps, half-duplex). Disabling this feature gives the user the ability to force the connection to the best mode of operation when trying to link with a non-negotiating device. Most Transition converters with Auto-Negotiation will allow you to disable this feature.

## ▶ Transparent Link Pass Through

Transparent Link Pass Through will notify an end device of a link failure just like Link Pass Through, however it uses a different method for "passing through" this information. Transparent Link Pass Through sends a link-loss signal over the fiber, instructing the remote converter to shut down the copper port thus notifying the end device, while maintaining the fiber link between the two converters (see diagram below).

- ▶ End device automatically notified of link loss
- ▶ Fiber link remains up as it carries a link-loss signal



## ▶ Pause (IEEE 802.3xy)

PAUSE signaling is an IEEE feature that temporarily suspends data transmission between two devices in the event that one of the devices becomes overwhelmed. In the event that a device needs some time to clear network congestion, it will send out a PAUSE signal to the other end device, which will then wait a pre-determined amount of time before re-transmitting the data. Transition's converters will pass PAUSE signaling unhindered; ensuring that the message is delivered to the end device.

- ▶ PAUSE enabled devices allowed to work properly
- ▶ Prevents loss of valuable data transmission
- ▶ Reduces bottlenecks and allows for efficient use of network devices

PAUSE signaling is not standardized over fiber media. Transition's media converters will communicate this signaling over fiber between the converters to pass this signaling on to the other end device.

## ▶ 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.



## ► Automatic Link Restoration

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

- No need to reset devices

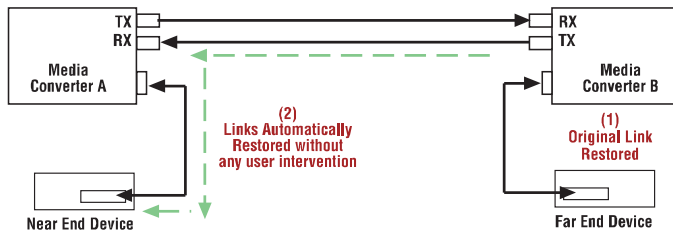
Transition Networks's converters will automatically re-establish link when connected to switches if link was lost. With other manufacturers' converters the user must reset the converter to re-establish the link.

- 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.



## ► Loopback

Select Transition Networks products are equipped with Loopback. This feature puts a converter in a special mode that enables the device to loop back the signal from the RX port to the TX port on either media for testing and troubleshooting purposes. Test signals from a tester (Firebird, etc.) can then be inserted into the link and looped back as received by a device to test a particular segment of the link (i.e. copper or fiber). Loopback can be either local or remote depending on the location of the converter in the link.

- Allows network diagnostics from local or remote location
- Quickly pinpoints problem areas of end to end link by testing a particular segment

Some converters have separate copper and fiber loopback functions that can be enabled separately, while others will loopback both copper and fiber at the same time when enabled. Please refer to the specific product page for details.

