User Guide

M/GE-T-xxx-01

Mini Media Converter

- **1000Base-T RJ-45 to 1000Base-SX/LX**
- **Low cost 1000M standalone media converter**
- **With Auto-Negotiation, Auto-cross, etc.**

Contents

Introduction

Transition Networks' M/GE-T-xx-01 is a mini form factor, 1000Base-T RJ-45 to 1000Base-SX/LX standalone Gigabit Ethernet Layer 1 media converter that supports:

- ☐ Plug and Play operation
- ☐ Auto-Negotiation
- ☐ Auto-cross
- ☐ Automatic link restoration
- ☐ Fiber Link Pass Through

Product Details

Power Input:	12VDC coax barrel input (7.5~13.9VDC)
Data speed:	1000Mbps
Copper port:	RJ-45
Fiber Port connector:	ST, SC, and SFP
Jumbo Frames (Ethernet port):	Supported up to 13,312bytes
DIP Switches / jumpers:	None; fixed configurations

Model Numbers

Model	Description	Fiber connector
M/GE-T-SX-01	1000Base-T to 1000Base-SX Mini Media Converter	MM SC 220/550m,850nm
M/GE-T-LX-01	1000Base-T to 1000Base-LX Mini Media Converter	SM SC, 10km, 1310nm
M/GE-T-SFP-01	1000Base-T to 1000Base-X Mini Media Converter, SFP slot (empty)	NA

***** Typical maximum cable distance; actual distance depends on the physical characteristics of the network.

Models M/GE-T-SFP-01 and M/GE-T-SX_LX-01(xx)

Installation

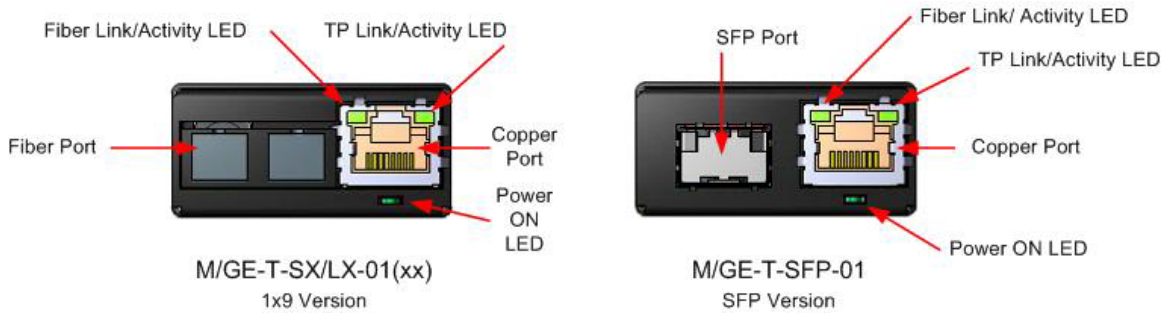
Observe ESD Precautions

Always observe the following ESD (Electrostatic Discharge) precautions when installing or handing the M/GE-T-xxx-01 media converter:

- Do not remove the converter from its protective packaging until you are ready to install it.
- Wear an ESD wrist grounding strap before handling any module or component. If you do not have a wrist strap, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.

Copper and fiber ports

The figure below shows the front panel of the M/GE-T-xxx-01 media converters.



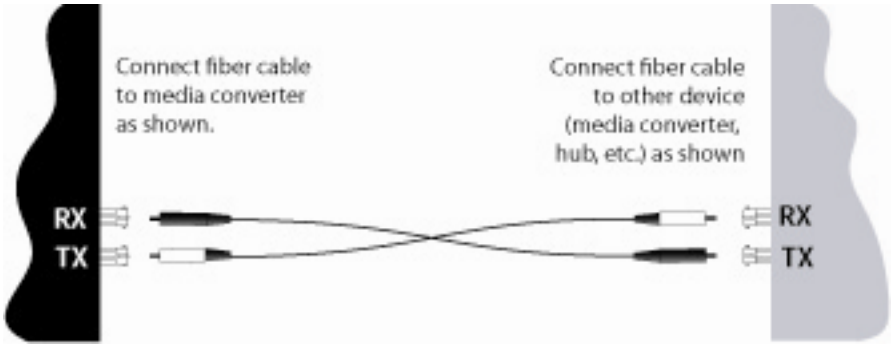
Connect the fiber cable

Full duplex (always ON) is on the fiber side only; therefore, the 512-Bit Rule does not apply. The cable lengths are constrained by the cable requirement.

1. Locate or build IEEE 803.2™ compliant 1000Base-X fiber cable with male, two-stranded TX to RX connectors installed at both ends.

2. Connect the fiber cable to the M/GE-T-xxx-01 media converters as follows:
   - 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 cable to the other device (another media converter, hub, etc.) as follows:
   - Connect the male TX cable connector to the female RX port.
   - Connect the male RX cable connector to the female TX port.



Connect the twisted-pair copper cable

The AutoCross feature allows either MDI (straight-through) or MDI-X (crossover) cable connections to be configured automatically, according to network conditions.

1. Locate or build IEEE 803.2™ compliant 10/100/1000Base-T cables with RJ-45 connectors installed at both ends.

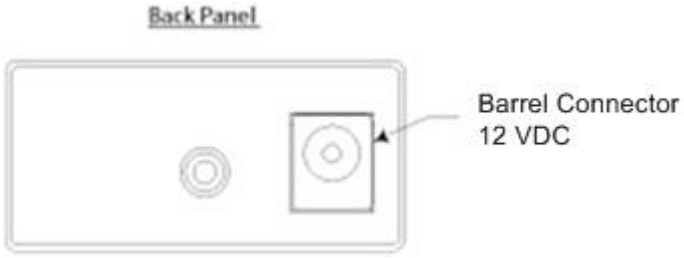
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the M/GE-T-xxx-01 media converter.

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.).

Note: With Fiber Link Pass Through permanently enabled, the copper Link LED only lights when there is a valid fiber link on the converter.

Power up the media converter

The M/GE-T-xxx-01 media converter is powered by using a DC power adapter through the barrel connector on its rear panel, as shown below.



M/GE-T-xxx-01 Back Panel Power

Power adapter

AC power

1. Connect the barrel connector of the power adapter to the media converter's power port (located on the back panel of the media converter).
2. Connect the power adapter plug to AC power.
3. Verify that the media converter is powered up by observing that the front panel LED power (PWR) indicator is lit.

DC power

Consult the user's guide for the Transition Networks SPS-1872-SA DC external power supply for powering the media converter.

Operation

Status LEDs

Use the status LEDs to monitor the M/GE-T-xxx-01 media converter operation in the network.

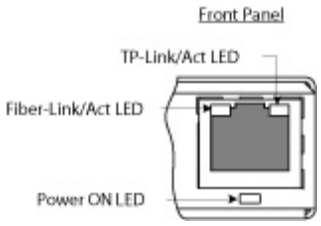
Power Indicator LED

Pwr LED: Green – ON for power applied to board

Ethernet RJ-45 LEDs

(Left) Fiber Port LED ON – ON for Link (*fiber*)
Blinking – Activity

(Right) TP Port LED ON – ON for Link (*copper*)
Blinking – Activity



Features

Auto-Negotiation

The M/GE-T-xxx-01 Auto-Negotiation feature is permanently enabled. Auto-Negotiation allows the media converter to configure itself automatically to achieve the best possible mode of operation over a link. It broadcasts speed (1000 Mb/s) and duplex capabilities (full) to the other device and negotiates the best mode of operation. Auto-Negotiation allows quick and easy installation because the optimal link is established automatically.

AutoCross™

The AutoCross feature allows using either straight-through (MDI) or crossover (MDI-X) copper cables. AutoCross determines the characteristics of the connection and automatically configures the device to link up, regardless of the copper cable configuration, MDI or MDI-X.

Automatic link restoration

The media converter will automatically re-establish the link when connected to a switch if the link is lost, even with Auto-Negotiation and Link Pass-through (both directions) enabled.

Fiber Link Pass Through (Fiber port only)

Link Pass Through is a troubleshooting feature that prevents media converters from isolating link failures and it allows end devices to be notified in the event of a loss of link. Link Pass Through provides the media converter with the ability to monitor both the fiber and the copper RX ports for a loss of signal. If a loss of RX signal occurs on one media port, the converter will automatically disable the TX signal on the other port. By shutting down the fiber TX port, the link failure is “passed through” to the remote converter and device. The end device automatically notified of link loss, which prevents loss of valuable data unknowingly transmitted over an invalid link.

Cable Specifications

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

Fiber cable

Bit Error Rate:	<10-9
Single mode fiber (recommended):	9 µm
Multimode fiber (recommended):	62.5/125 µm
Multimode fiber (optional):	100/140, 85/140, 50/125 µm
M/GE-T-SX-01	850nm 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
M/GE-T-LX-01	1310 nm single mode
Fiber-optic Transmitter Power:	min: -9.5 dBm max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -20.0 dBm max: -3.0 dBm
Link Budget:	10.5 dB

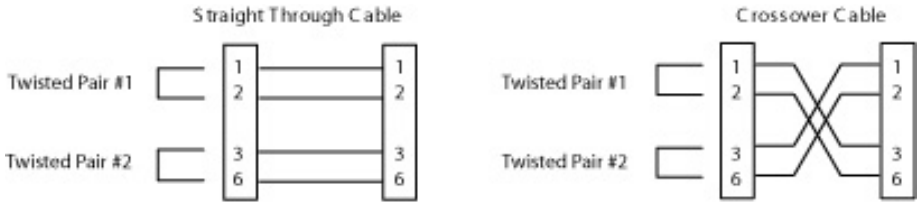
The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

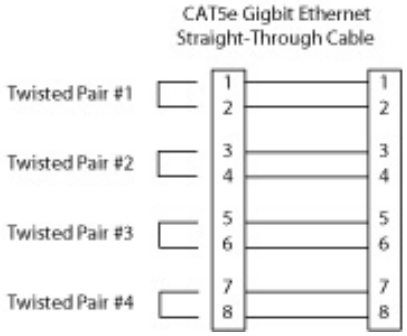
Copper cable

Categories 5 and 5e: 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 (STP) or unshielded (UTP) twisted-pair cable may be used.
- Pins 1&2 and 3&6 are the two active pairs in an Ethernet network.
- All four pairs are used in a gigabit 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.





Technical Specifications

For Transition Networks' Model M/GE-T-xxx-01 or equivalent:

Standards	IEEE802.3, 802.3z, 802.3ab
Regulatory Compliance for Emission	CISPR22/EN55022 Class A, FCC Class A
Regulatory Compliance for Immunity	EN55024
Safety Compliance	Unit: CE Mark
Data Rate	1000Mb/s
Power Consumption	0.2A@12VDC, 2.4 watts
Power Source	12VDC external wall mounted power supply that is UL Listed
Size (width x depth x height)	Width: 1.8" [46 mm] Depth: 3.3" [85 mm] Height: 0.85" [22 mm]
Operating Temperature	0 to 50 degree C
Storage Temperature	-15 to 65 degree C
Altitude	0-10,000 feet
Operating Humidity	5% to 95% (non-condensing)

For current information on the M/GE-T-xxx-01, view the online user guide at www.transition.com.

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.

WARNING: Visible and invisible laser radiation when open. Do not stare into the beam or view the beam directly with optical instruments. Failure to observe this warning could result in an eye injury or blindness.

WARNING: Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

IMPORTANT: Copper based media ports such as Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are intended to be connected to intra-building (inside plant) link segments that are not subject to lightening transients or power faults. Copper-based media ports such as Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are NOT to be connected to inter-building (outside plant) link segments that are subject to lightening transients or power faults.

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 power LED illuminated and did the TX and FX LEDs turn ON then turn OFF?

   NO

   • Is the power adapter the proper type of voltage and cycle frequency for the AC outlet?

   • Is the power adapter properly installed in the media converter and in the outlet?

   • Contact TN Tech Support: US/Canada: 1-800-260-1312, or International: 00-1-952-941-7600.

   YES

   • Proceed to step 2.

Note the following:

   • As a link pass-through device both copper and fiber cables must be installed before the LEDs will light.

2. Are the “FX – Link” and “TX-Link/Act” LEDs lit on the RJ-45 port ?

   NO

   • Check the copper cables for proper connection.

   • Check the fiber cables for proper connection.

   • Contact Technical Support: US/Canada: 1-800-260-1312, or 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

Compliance Information

Declaration of Conformity

Declaration of Conformity

Transition Networks, Inc.

10900 Red Circle Drive, Minnetonka, Minnesota 55343 U.S.A.

Declares that the products:

Media Converters M/GE-T-xxx-01

Model #s: M/GE-T-SX-01, M/GE-T-LX-01, M/GE-T-SFP-01

Conform to the following Product Regulations:

FCC 47 CFR Part 15 :2012 Class A
ANSI C63.4:2009
EMC-Directive 2004/108/EC
EN 55022:2010 Class A
EN 61000-3-2:2006/A1:2009/A2:2009
EN61000-3-3:2008
EN55024:2010
IEC61000-4-2:2008
IEC61000-4-3:2006/A2:2010
IEC61000-4-4:2004
IEC61000-4-5:2005
IEC61000-4-6:2008
IEC61000-4-8:2009
IEC61000-4-11:2004

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standards(s).

Minnetonka, Minnesota — Place
November 13, 2012 — Date
Signature
Stephen Anderson — Full Name
Vice President of Engineering — Position

CE Mark

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 Fäll is der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilsateur de prende les measures 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.

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 öffentlickes Telekommunikationsnetz in den EGMitgliedstaaten

verstösst gegen die jeweligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

Record of Revisions

Rev	Date	Notes
A	04/11/13	Initial release.