

User Guide

M/E-TX-FX-01

Mini Media Converter

- 100Base-TX RJ-45 to 100Base-FX
- Low cost 100M standalone media converter
- With Auto-Negotiation, Auto-cross, etc.



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Introduction

Transition Networks' M/E-TX-FX-01 is a mini form factor, 100Base-TX RJ-45 to 100Base-FX converter. The M/E-TX-FX-01 is a plug and play operation fast Ethernet layer 1 standalone media converter that supports these features:

- Auto-Negotiation
- Auto-cross
- Far End Fault
- Automatic link restoration

Product Details

Power Input:	12 VDC coax barrel input (7.5~13.9 VDC)
Data speed:	100 Mbps
Copper port:	RJ-45
Fiber Port connector:	ST, SC or SFP
Jumbo Frames (Ethernet port):	Supported up to 9016bytes
DIP Switches / jumpers:	None; fixed configurations

Model Numbers

Model	Description	Fiber connector
M/E-TX-FX-01(ST)	100Base-TX to 100Base-FX Mini	MM ST 2KM
M/E-TX-FX-01(SC)	100Base-TX to 100Base-FX Mini	MM SC 2KM
M/E-TX-FX-01(SM)	100Base-TX to 100Base-FX Mini	SM SC, 20KM
M/E-TX-FX-01(SFP)	100Base-TX to 100Base-X Mini	SFP slot (empty)
M/E-TX-FX-01(100)	100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1310nm TX/1550nm RX	SM SC 20 KM (12.4 mi.)
M/E-TX-FX-01(101)	100BASE-TX (RJ-45) [100 m/328 ft.] to 100BASE-FX 1550nm TX/1310nm RX	SM SC 20 KM (12.4 mi.)

* Typical maximum cable distance; actual distance depends on the physical characteristics of the network. Longer transmission distances, bi-directional transmissions, and CWDM technology are all supported via specific SFP modules



Models M/E-TX-FX-01 and M/E-TX-FX-01(SFP)

Installation

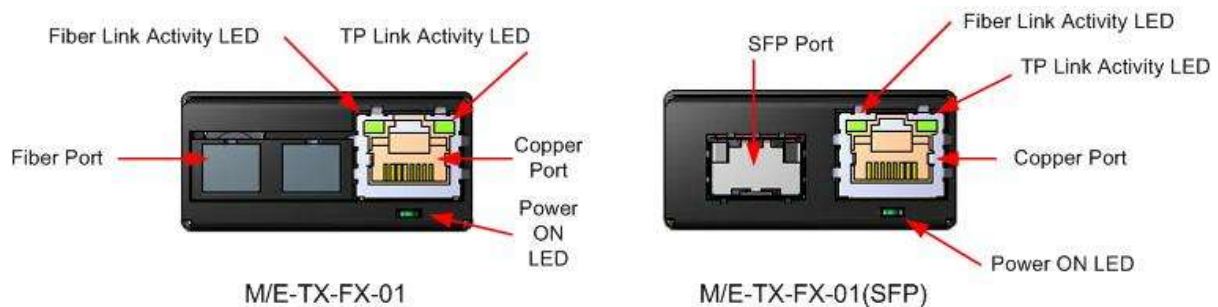
Observe ESD Precautions

Always observe the following ESD (Electrostatic Discharge) precautions when installing or handling the M/E-TX-FX-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

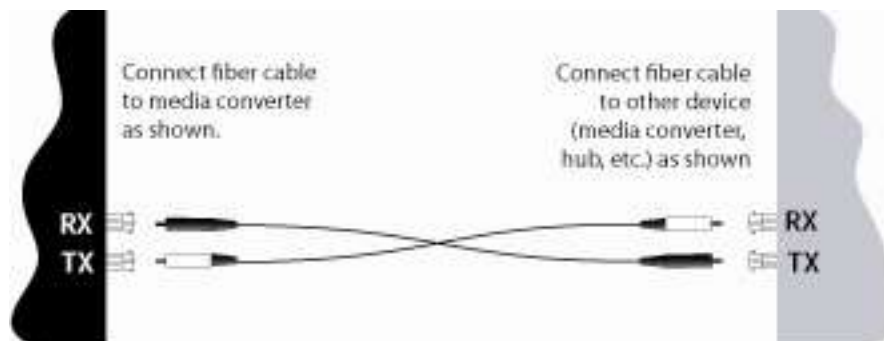
The figure below shows the front panel of the M/E-TX-FX-01 media converters.



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 100 Base-X fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cable to the M/E-TX-FX-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.



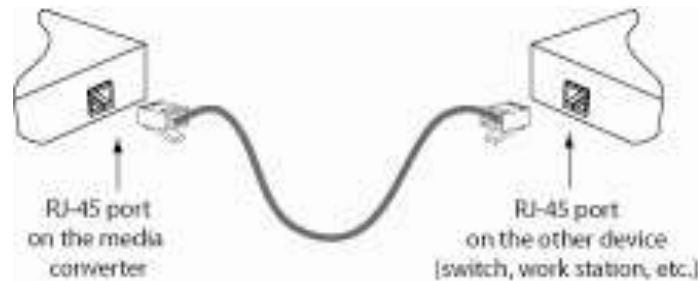
Connect the twisted-pair copper cable

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

- If full-duplex mode is used, the 512-Bit Rule does not apply. The cable lengths are constrained by the cable requirements.

Perform these steps:

1. Locate or build IEEE 803.2™ compliant 100Base-TX cable, 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/E-TX-FX-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.).



Power warnings

WARNING: If the media converter is an IEEE802.3-2005 Powered Device (PD) capable of receiving power via the Media Dependent Interface (MDI) leads, the power source, connector, and cables attached to the barrel power connector must meet the isolation requirement specified in IEEE 802.3-2005.

Power up the media converter

The figure below shows the power connector.



M/E-TX-FX-01 and M/E-TX-FX-01(SFP) 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 the illuminated LED power indicator light on the front panel.

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 LEDs to monitor the status of the media converter.

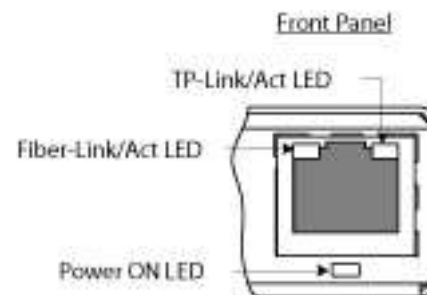
FX-Link/Act LED

Green ON = Link (*fiber*)
 Flashing = Activity

TX-Link/Act LED

Green ON = Link
 Flashing = Activity

Power LED ON = Connected to power



Features

Auto-Negotiation

The Auto-Negotiation feature is ON permanently for the M/E-TX-FX-01 media converters. Auto-Negotiation allows the media converter to configure itself automatically to achieve the best possible mode of operation over a link. It broadcasts speed (100 Mbps) 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.

In a scenario where an auto-negotiation device is linked to a non-negotiating device, the negotiating device via parallel detection recognizes the speed of the second device then establishes the best operating speed (100 Mbps).

AutoCross™

The AutoCross feature allows using either straight-through (MDI) or crossover (MDI-X) copper cables when connecting to 100Base-TX devices. 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 enabled.

Far-End Fault (always ON)

When a fault occurs on an incoming fiber link (1), the media converter transmits a Far-End Fault signal on the outgoing fiber link (2).

Cable Specifications

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

Fiber optic

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/E-TX-FX-01	
M/E-TX-FX-01 (SC)	1300 nm multimode
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
M/E-TX-FX-01 (SM)	1310 nm single mode
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
M/E-TX-FX-01 (100) (SM)	1310TX/1550RX nm, single-strand fiber
M/E-TX-FX-01 (101) (SM)	1550TX/1310RX nm, single-strand fiber
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

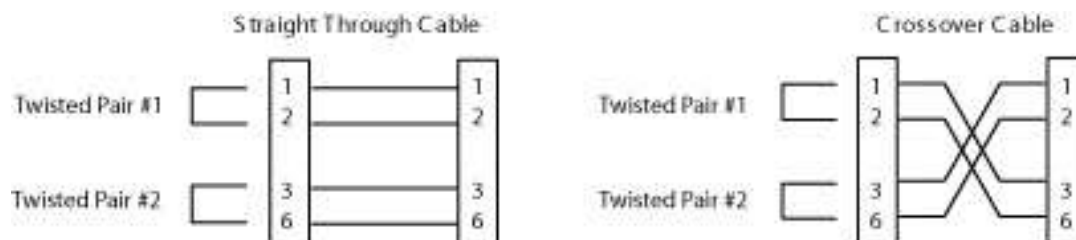
The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

Copper cable

Category 5: (Minimum requirement for 100 Mb/s operation)

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.
- 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 use with Transition Networks Model M/E-TX-FX-01 converters.

Standards:	IEEE 802.3™, IEEE 802.3u
Regulatory Compliance for Emission	FCC Class A; EN55022 Class A
Regulatory Compliance for Immunity	EN55024,
Safety Compliance	Unit: CE Mark
Data rate:	100 Mb/s
Dimensions:	1.8"W x 3.35"D x 0.85"H (45.7 x 85.1 x 21.6 mm)
Weight:	2 lbs. (0.90 kg) approximately
Power consumption:	2.6 watts
MTBF*:	41,680 hours ((MIL-HDBK-217F) 114,580 hours (Bellcore7 V5.0)
Power sources:	Barrel connector – Wall Mount AC power adapter 12VDC 400mA (the external power supply provided with this product is UL listed and C-UL listed Canada by the manufacturer).
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
Warranty:	Lifetime

* MTBF (*Mean Time Between Failure*) is estimated using the predictability method. The computation is based on the MIL-HDBK-217 F and Bellcore standards.

**Manufacturer's rated ambient temperature.

WARNING: If the media converter is an IEEE802.3-2005 Powered Device (PD) capable of receiving power via the Media Dependent Interface (MDI) leads, the power source, connector, and cable attached to the barrel power connector must meet the isolation requirement specified in IEEE802.3-2005. Failure to observe this warning could result in an electrical shock.

CAUTION: Copper based media ports, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are intended to be connected to intrabuilding (inside plant) link segments that are not subject to lightening transients or power faults. Copper-based media ports, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are NOT to be connected to interbuilding (outside plant) link segments that are subject to lightening transients or power faults. Failure to observe this caution could result in damage to equipment.

Copper-based media ports, e.g., 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, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are NOT to be connected to interbuilding (outside plant) link segments that are subject to lightening transients or power faults.

WARNING: Visible and invisible laser radiation when open. Do not stare into the beam or view 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 could result in hazardous radiation exposure. The information in this user's guide is subject to change. For the most current information, view the online user guide at www.transition.com and the click on **Product/Product Finder**.

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 lit and did the TX and FX LEDs turn ON and then turn OFF?

NO

- Is the device powered by an adapter?
- 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 AC outlet?
- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

YES

Proceed to step 2.

Note: the M/E-TX-FX-01 (no link pass-through option), the TX LED will turn ON when the twisted pair copper cable is installed; the FX LED will turn ON when the fiber cable is installed.

2. Are the "TX and FX-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, 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

<i>Declaration of Conformity</i>	
<i>Transition Networks, Inc.</i>	
<small>Manufacturer's Name</small>	
<u>10900 Red Circle Drive, Minnetonka, Minnesota 55343 U.S.A.</u>	
<small>Manufacturer's Address</small>	
Declares that the products:	
Media Converters M/E-TX-FX-01 and M/GE-T-xxx-01	
Model #: M/E-TX-FX-01, M/E-TX-FX-01(SC), M/E-TX-FX-01(SM), M/E-TX-FX-01(SFP)	
and 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	
EN 61000-3-3:2008	
EN 55024:2010	
IEC 61000-4-2:2008	
IEC 61000-4-3:2006/A2:2010	
IEC 61000-4-4:2004	
IEC 61000-4-5:2005	
IEC 61000-4-6:2008	
IEC 61000-4-8:2009	
IEC 61000-4-11:2004	
I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).	
<u>Minnetonka, Minnesota</u>	<u>July 13, 2012</u>
<small>Place</small>	<small>Date</small>
 <hr style="width: 100%;"/>	
<u>Stephen Anderson</u>	<u>Vice President of Engineering</u>
<small>Full Name</small>	<small>Position</small>
<small>28141B</small>	

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 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.



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 öffentliches Telekommunikationsnetz in den EGMitgliedstaaten verstösst gegen die jeweiligen 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.
B	07/30/13	Add M/E-TX-FX-01(100) and M/E-TX-FX-01(101).

Trademark Notice

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