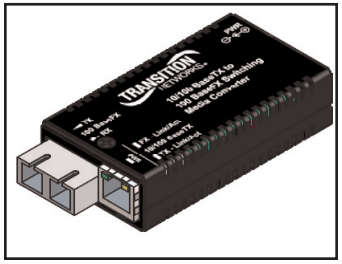
TRANSITION NETWORKS



User's Guide

M/E-PSW-FX-01, MP/E-PSW-FX-01 & MU/E-PSW-FX-01

Stand-Alone Media Converters

- **Copper to Fiber**
- **10/100Base-TX to 100Base-FX**

The miniature, plug-and-play operation Mx/E-PSW-FX-01 2-port Ethernet/Fast Ethernet bridging media converters allow connecting 10Base-T Ethernet and/or 100Base-TX Fast Ethernet twisted-pair copper network devices to network devices on a 100Base-FX Fast Ethernet fiber network. Depending on the media converter, the end user has the choice of three options for powering the converters: power adapter *(shipped with converter)*, USB, or "802.3af™ Power over Ethernet" (PoE) enabled device.

M/E-PSW-FX-01: Auto-Negotiation, AutoCross, Far End Fault (FEF)

Part Number	Copper - Port 10Base-T/100Base-TX	Fiber-Optic -Port 100Base-FX
M/E-PSW-FX-01 (ST)	RJ-45 100 m *(328 ft)**	ST, 1300 nm multimode 2 km *(1.2 miles)**
M/E-PSW-FX-01 (SC)	RJ-45 100 m *(328 ft)**	SC, 1300 nm multimode 2 km *(1.2 miles)**
M/E-PSW-FX-01 (SM)	RJ-45 100 m *(328 ft)**	SC, 1310 nm single mode 20 km *(12.4 miles)**
Single-Strand Fiber Models		
M/E-PSW-FX-01 (100)	RJ-45 100 m *(328 ft)**	SC, 1310TX/1550RX nm. single mode, 20 km *(12.4 miles)**
M/E-PSW-FX-01 (101)	RJ-45 100 m *(328 ft)**	SC, 1550TX/1310RX nm single mode, 20 km *(12.4 miles)**

MP/E-PSW-FX-01: PoE PD, Auto-Negotiation, AutoCross, Link-Pass Through, Far End Fault

Part Number	Copper - Port 10Base-T/100Base-TX	Fiber-Optic -Port 100Base-FX
MP/E-PSW-FX-01 (ST)	RJ-45 100 m *(328 ft)**	ST, 1300 nm multimode 2 km *(1.2 miles)**
MP/E-PSW-FX-01 (SC)	RJ-45 100 m *(328 ft)**	SC, 1300 nm multimode 2 km *(1.2 miles)**
MP/E-PSW-FX-01(SM)	RJ-45 100 m *(328 ft)**	SC, 1310 nm single mode 20 km *(12.4 miles)**

MU/E-PSW-FX-01: USB Pwr, Auto-Negotiation, AutoCross, Link-Pass Through

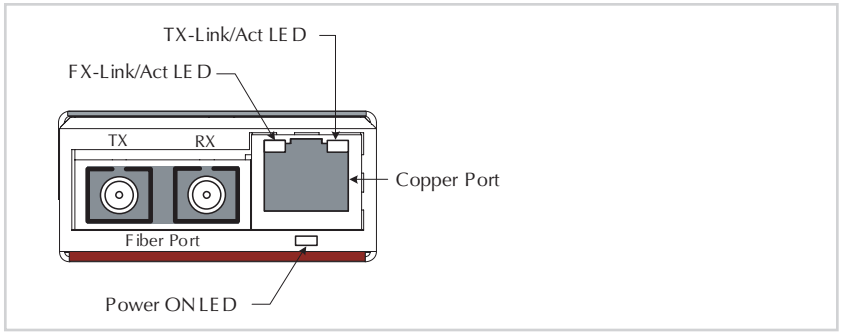
Part Number	Copper - Port 10/100Base-TX	Fiber-Optic -Port 100Base-FX
MU/E-PSW-FX-01 (ST)	RJ-45 100 m *(328 ft)**	ST, 1300 nm multimode 2 km *(1.2 miles)**
MU/E-PSW-FX-01 (SC)	RJ-45 100 m *(328 ft)**	SC, 1300 nm multimode 2 km *(1.2 miles)**
MU/E-PSW-FX-01 (SM)	RJ-45 100 m *(328 ft)**	SC, 1310 nm single mode 20 km *(12.4 miles)**
Single-Strand Fiber Models		
MU/E-PSW-FX-01 (100)	RJ-45 100 m *(328 ft)**	SC, 1310TX/1550RX nm. single mode, 20 km *(12.4 miles)**
MU/E-PSW-FX-01 (101)	RJ-45 100 m *(328 ft)**	SC, 1550TX/1310rx nm single mode, 20 km *(12.4 miles)**

* Typical maximum cable distance. Actual distance is dependent upon the physical characteristics of the network.

Installation

Copper and fiber ports

The illustration below shows the front panel of the Mx/E-PSW-FX-01 media converters.



Electrostatic Discharge (ESD)

Always observe the following ESD precautions when installing or handing the Mx/E-PSW-FX-01 media converter:

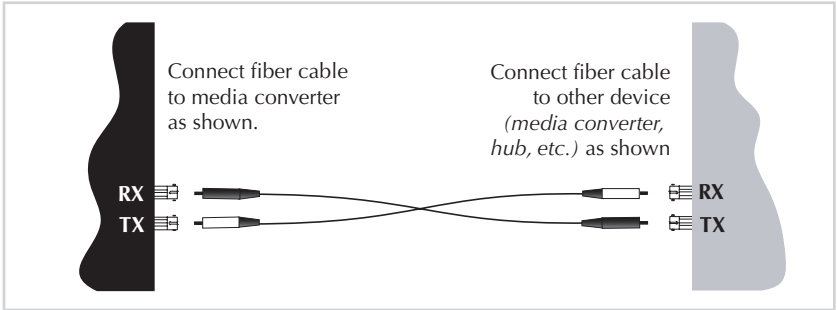
- Do not remove the converter from its protective packaging until you are ready to install it.
- Wear an ESD wrist grounding strap before handling any module or component. If you do not have a wrist strap, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.

Installation -- Continued

Connect the fiber cable

Full dupex *(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 100Base-FX fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cable to the Mx/E-PSW-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.



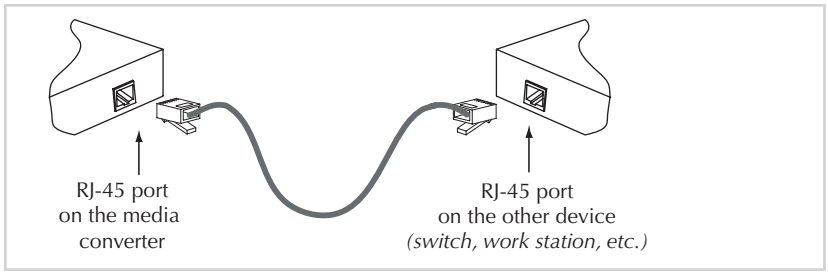
Installation -- Continued

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

1. Locate or build IEEE 803.2™ compliant 10Base-T or 100Base-TX 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 Mx/E-PSW-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 IEEE802.3-2005.

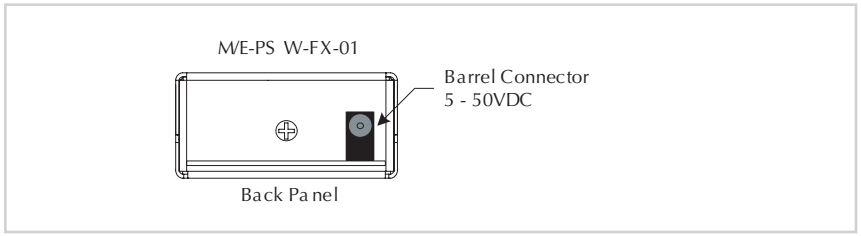
WARNING: When powering the model MP/E-PSW-FX-01 via "Power over Ethernet" only, a barrel cover *(provided)* must be installed on the back panel of the converter for safety. Failure to observe this warning could result in an electrical shock.

Installation -- Continued

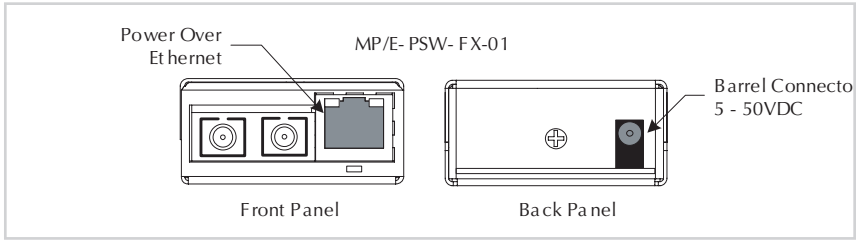
Powering the media converter

The power options for the Mx/E-PSW-FX-01 media converter are product dependent. The following shows the various power configurations associated with each model.

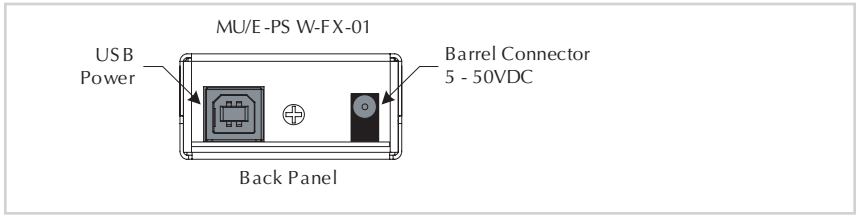
M/E-PSW-FX-01 Back Panel Power



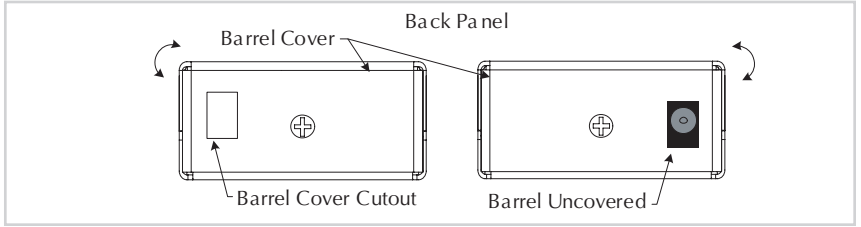
MP/E-PSW-FX-01 Back Panel Power Options



MU/E-PSW-FX-01 Back Panel Power Options



MP/E-PSW-FX-01 Back-Panel Barrel Safety Cover *(only on this model)*



Installation -- Continued

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.

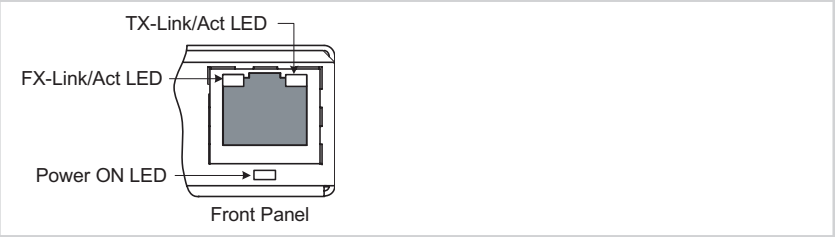
DC power

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.



LED descriptions are as follows:

FX-Link/Act LED

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

TX-Link/Act LED

Green	ON	= Link
	Flashing	= Activity

Power LED

Green	ON	= Connected to power

Operation -- Continued

Product features

Congestion reduction

The Mx/E-PSW-FX-01 media converters do not forward collision signals or error packets from one collision domain to another, resulting in improvements in baseline network performance. In addition, the media converter filters packets destined for local devices, which reduces network congestion also.

Auto-Negotiation

The Auto-Negotiation feature is ON permanently for the Mx/E-PSW-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 *(10 Mb/s or 100 Mb/s)* and duplex capabilities *(full or half)* 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.

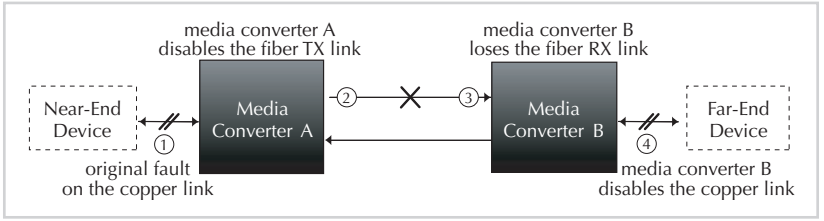
In a scenario where an auto-negotiation device is linked to a non-negotiating device, the negotiating device via parallel detection recognizes the speed of that second device then establishes the best operating speed *(10Mbs or 100Mbs)* at half-duplex.

AutoCross™

The AutoCross feature allows using either straight-through (MDI) or crossover (MDI-X) copper cables when connecting to 10Base-T or 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.

Link Pass-Through

The Link Pass-Through feature *(illustrated below)* allows the media converter to monitor both the fiber and copper RX *(receive)* ports for loss of signal. In the event of an RX signal loss (1), the media converter will automatically disable the TX *(transmit)* signal (2), thus "passing through" the link loss (3). The far-end device is automatically notified of the link loss (4), which prevents the loss of valuable data unknowingly transmitted over an invalid link.



Note: In the link pass-through devices *(MP/E-PSW-FX-01 MU/E-PSW-FX-0)* both copper and fiber cables must be installed before the LEDs will light.

Operation -- Continued

Product features -- continued

Auto-Negotiation, AutoCross, Link Pass-Through, Far End Fault

Media Converter	Auto-Negotiation	AutoCross	LPT	FEF
M/E-PSW-FX-01	Yes	Yes	No	Yes
MP/E-PSW-FX-01	Yes	Yes	Yes	Yes
MU/E-PSW-FX-01	Yes	Yes	Yes	Yes

Automatic link restoration

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

Full-Duplex flow control

In a full-duplex network, maximum cable lengths are determined by the type of cables used—see page 1 *(front cover)* for Mx/E-PSW-FX-01 cable specifications.

The 512-Bit Rule does not apply in a full-duplex network.

Note: Full duplex is ON permanently for the fiber port only.

Half-Duplex flow control *(512-Bit Rule)*

In a half-duplex network, the maximum cable lengths are determined by the round-trip delay limitations of each Fast Ethernet collision domain. *(A collision domain is the longest path between any two terminal devices; e.g., a terminal, switch, or router.)*

The 512-Bit Rule determines the maximum length of cable permitted by calculating the round-trip delay in bit-times (BT) of a particular collision domain. If the result is less than or equal to 512 BT, the path is good.

For more information on the 512-Bit Rule, see the white paper titled “Collision Domains” on the Transition Networks website at: www.transition.com

Flow Control

The process of adjusting the flow of data from one device to another ensures that the receiving device can handle all of the incoming data. This is particularly important where the sending device is capable of transmitting data much faster than the receiving device can accept it.

Operation -- Continued

Product features -- continued

Distance extension

The Mx/E-PSW-FX-01 media converters can segment one (1) 10Base-T copper Ethernet and/or 100Base-TX copper Fast Ethernet, and one (1)100Base-FX fiber Fast Ethernet collision domain:

In a half-duplex Ethernet or Fast Ethernet environment, the Mx/E-PSW-FX-01 media converters extend network distances by segmenting collision domains so that the 512-Bit Rule applies separately to each collision domain.

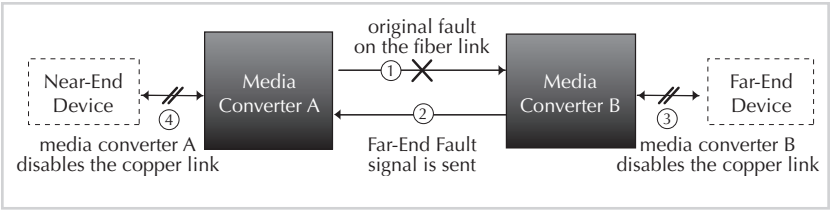
In a full-duplex Ethernet or Fast Ethernet environment, the Mx/E-PSW-FX-01 media converters extend network distances to the physical cable limitations imposed by the selected twisted-pair copper fiber cables.

Rate conversion

The Mx/E-PSW-FX-01 media converters allow connection of 10Mb/s terminal devices on a 10Base-T legacy Ethernet copper network to 100Mb/s terminal devices on a 100Base-TX Fast Ethernet copper network and/or to 100Mb/s terminal devices on a 100Base-FX Fast Ethernet fiber network.

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). In addition the Far-End Fault signal also activates the Link Pass-Through, which, in turn, disables the link on the copper portion of the network (3) and (4).



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/E-PSW-FX-01		
M/E-PSW-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-PSW-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-PSW-FX-01 (100) (SM)	1310TX/1550RX nm, single-strand fiber	
M/E-PSW-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	
MP/E-PSW-FX-01		
MP/E-PSW-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	
MP/E-PSW-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	
MU/E-PSW-FX-01		
MU/E-PSW-FX-01 (SC)	1300 nm multi mode	
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	
MU/E-PSW-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	
MU/E-PSW-FX-01 (100) (SM)	1310TX/1550RX nm, single-strand fiber	
MU/E-PSW-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 IEC-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

Cable Specifications -- Continued

Copper cable

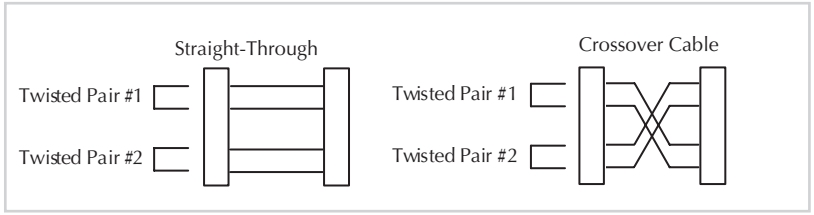
Category 3: *(Minimum requirement for 10 Mb/s operation)*

Gauge	24 to 22 AWG
Attenuation	11.5 dB/100m @ 5-10 MHz
Maximum Cable Distance	100 meters

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 Mx/E-PSW-FX-01 converters.

Standards:	IEEE 802.3™, IEEE 802.3af™	
Data rate:	10 Mb/s, 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:	3.2 oz. *(90.7 g)* approximately	
Power consumption:	2.6 watts	
MTBF*:	49,896 hours *(MIL217F2 V5.0) (MIL-HDBD-217F)* 132,736 hours *(Bellcore7 V5.0)*	
Packet size:	Memory: 9256K bytes Unicast MAC addresses: 4K	
Maximum packet size:	9256K bytes	
Power sources:	• Barrel connector - Wall Mount AC adapter 12VDC 400mA *(The external power supply provided with this product is UL listed by the power supply's manufacturer.)* • USB connector: 5VDC • TP connector IEEE 802.3af™ PSE device: 36 to 57VDC	
Environment:	Tmra**:	0°C to 50°C *(32°F to 122°F)*
	Storage Temp:	-25°C to 65°C *(-13°F to 149°F)*
	Humidity:	5% to 95%, non-condensing
	Altitude:	0 to 10,000 feet
Warranty:	Lifetime	

*MTBF is estimated using the predictability method. This method is based on MIL-217F at 25°C ambient temperature, typical enclosure heat rise of 10°C with nominal operating conditions and parameters. Installation and configuration specific MTBF estimates are available upon request. Contact Technical Support.

**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 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 inter-building *(outside plant)* link segments that are subject to lightening transients or power faults. Failure to observe this caution could result in damage to equipment.

Technical Specifications -- Continued

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 inter-building *(outside plant)* link segments that are subject to lightening transients or power faults.

The product is certified by the manufacturer to comply with DHHS Rule 21/CFR, Subchapter J applicable at the date of manufacture.

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 up-to-date information, view the user's guide on-line at: www.transition.com.

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 device power by an adapter, USB plug, or "Power over Ethernet"?

     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?
   - Is the USB cable properly installed and its supplied voltage at the proper level? *(See Technical Spec.)*
   - If PoE, is the RJ-45 jack receiving power from the input device? *(See Technical Spec.)*
   - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

   YES
   - Proceed to step 2.

2. Note the following:
   - In the link pass-through devices *(MP/E-PSW-FX-01 MU/E-PSW-FX-0)* both copper and fiber cables must be installed before the LEDs will light.
   - The M/E-PSW-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.

Troubleshooting -- Continued

Are the “TX and FX-Link/ACT” LEDs illuminated 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 **w**ww.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
6475 City West Parkway
Minneapolis, MN 55344, U.S.A.
telephone: 952-941-7600
toll free: 800-526-9267
fax: 952-941-2322

TRANSITION NETWORKS

Declaration of Conformity

Name of Mfg:	Transition Networks 6475 City West Parkway, Minneapolis MN 55344 U.S.A.
Model:	Mx/E-PSW-FX-01 Series Media Converters
Part Number(s):	M/E-PSW-FX-01, M/E-PSW-FX-01(10x) MP/E-PSW-FX-01, MU/E-PSW-FX-01, MU/E-PSW-FX-01(10x)
Regulation:	EMC Directive 89/336/EEC

Purpose: To declare that the Mx/E-PSW-FX-01 and the Mx/E-PSW-FX-01(10x) to which this declaration refers is in conformity with the following standards.

EN 55022:1994 + A1:1995 + A2:1997; EN 55024:1998 + A1:2001 + A2:2003

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

July, 2007
Date

Compliance Information

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 ist 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.

Compliance -- Continued

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 EG-Mitgliedstaaten 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.