

## User's Guide

### J/E-PSW-FX-02

#### Stand-Alone Media Converter

- **Just Convert-IT**
- **10/100 Bridging (2-Port)**
- **10Base-T/100Base-TX to 100Base-FX**

The J/E-PSW-FX-02 Ethernet/Fast Ethernet 2-port bridging media converter connects 10Base-T Ethernet or 100Base-TX Fast Ethernet twisted-pair copper network devices to network devices on a 100Base-FX Fast Ethernet fiber network.

Part Number	Port One - Copper 10Base-T/100Base-TX	Port Two - Duplex Fiber-Optic 100Base-FX
J/E-PSW-FX-02	RJ-45 100 m (328 ft)*	ST, 1300 nm multimode 2 km (1.2 miles)
J/E-PSW-FX-02(SC)	RJ-45 100 m (328 ft)*	SC, 1300 nm multimode 2 km (1.2 miles)
J/E-PSW-FX-02(SM)	RJ-45 100 m (328 ft)*	SC, 1310 nm single mode 20 km (12.4 miles)
J/E-PSW-FX-02-100	RJ-45 100 m (328 ft)*	SC, 1310 nm TX/1550 nm RX SM, 20 km(12.4 miles)**
J/E-PSW-FX-02-101	RJ-45 100 m (328 ft)*	SC, 1550 nm TX/1310 nm RX SM, 20 km (12.4 miles)**

#### Optional Accessories (sold separately)

Part Number	Description
SPS-1872-SA	Optional External Power Supply; 18-72VDC Stand-Alone; Output: 12.6VDC, 1.0 A
SPS-1872-CC	Optional External Power Supply; 18-72VDC Piggy-back; Output: 12.6VDC, 1.0 A
E-MCR-04	12-Slot Media Converter Rack (includes universal internal power supply) 17 x 15 x 5 in. (432 x 381 x 127 mm)
WMBS	Optional Wall Mount Brackets Length: 3.2 in. (81 mm), Fits converter length: 3.9 in. (99 mm)
WMBV	Optional Vertical Mount Bracket; Length: 5.0 in. (127 mm)
WMBD	Optional DIN Rail Mount Bracket; Length: 5.0 in. (127 mm)
WMBD-FS	Optional DIN Rail Mount Bracket (flat, small); Length: 3.1in. (79 mm)

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

\*\* Single Fiber, install in pairs.

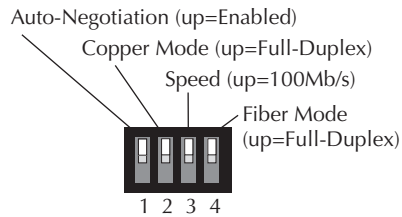
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## Installation

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when setting the 4-position switch. Failure to observe this caution could result in damage to the media converter.

### Setting the 4-position switch

The 4-position switch is located on the rear panel of the media converter. Use a small, flat-blade screwdriver to set the recessed switches. (See the drawing to the right.)



#### 1. Auto-Negotiation

**UP** Enables Auto-Negotiation on the copper port.  
Advertises 100 Mb/s full-duplex and half duplex, and 10 Mb/s full-duplex and half duplex.

**DOWN** Disables Auto-Negotiation on the copper port.

#### 2. Copper Mode

(Applies only if switch 1 is DOWN.)

**UP** Forces full-duplex operation on the copper port.

**DOWN** Forces half-duplex operation on the copper port.

#### 3. Speed

(Applies only if switch 1 is DOWN.)

**UP** Forces 100 Mb/s operation on the copper port.

**DOWN** Forces 10 Mb/s operation on the copper port.

#### 4. Fiber Mode

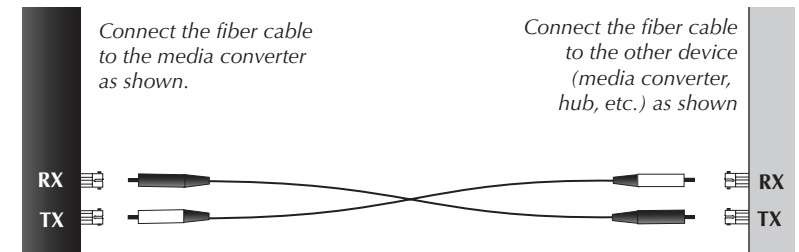
**UP** Forces full-duplex operation on the fiber port.

**DOWN** Forces half-duplex operation on the fiber port.

## Installation -- Continued

### Installing the fiber cable

1. Locate IEEE 803.2™ compliant 100Base-FX fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the J/E-PSW-FX-02 media converter as described:
  - Connect the male TX cable connector the female TX port.
  - Connect the male RX cable connector to the female RX port.
3. Connect the fiber cables to the other device (*another media converter, hub, etc.*) as described:
  - Connect the male TX cable connector the female RX port.
  - Connect the male RX cable connector to the female TX port.



### Installing the twisted-pair copper cable

1. Locate or build IEEE 803.2™ compliant 10Base-T or 100Base-TX cables, with male 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 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:** The MDI (*straight-through*) or MDI-X (*crossover*) cable connection is configured automatically, according to the network conditions.



## Installation -- Continued

### Powering the media converter

**NOTE:** The external power supply provided with this product is UL listed by the power supply's manufacturer.

#### AC

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

#### DC

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

## Operation

### Using the status LEDs

Use the status LEDs to monitor the media converter and the network connections.

#### Link Act (*Fiber Link/Activity*)

On = fiber link connection.

Flashing = fiber network activity.

#### FD (*Fiber Duplex*)

On = full-duplex.

Off = half-duplex.

#### PWR (*Power*)

On = connection to external AC or DC power.

#### 100 (*Copper Speed*)

On = 100 Mb/s.

Off = 10 Mb/s.

#### Link Act (*Copper Link/Act*)

On = copper link connection.

Flashing = copper network activity.

#### FD (*Copper Duplex*)

On = full-duplex.

Off = half-duplex.



## Operation - Continued

### Product Features

#### Auto-Negotiation

The Auto-Negotiation feature allows the J/E-PSW-FX-02 media converter to automatically configure itself to achieve the best possible mode of operation over a link. The media converter broadcasts its speed (*10 Mb/s or 100 Mb/s*) and duplex capabilities (*full or half*) to the other devices and negotiates the best mode of operation. Auto-Negotiation allows quick and easy installation because the optimal link is established automatically. No user intervention is required to determine the best mode of operation.

A scenario where the media converter is linked to a non-negotiating device, disable Auto-Negotiation. In this instance, the mode of operation will drop to the least common denominator between the two devices (*e.g., 10 Mb/s, half-duplex*). Disabling this feature gives the user the ability to force the connection to the best mode of operation.

#### AutoCross™

When the AutoCross feature is activated, it allows either straight-through (MDI) or crossover (MDI-X) copper cables to be used when connecting to 10Base-T or 100Base-TX devices. AutoCross determines the characteristics of the connection and automatically configures the unit to link up, regardless if the copper cable is MDI or MDI-X configuration.

## Operation - Continued

### Product Features - Continued

#### Full-Duplex Network

In a full-duplex network, maximum cable lengths are determined by the type of cables that are used. See page 1 (*front cover*) for the cable specifications for the different J/E-PSW-FX-02 models.

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

#### Half-Duplex Network (*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](http://www.transition.com).

## Cable Specifications

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

### Fiber Cable

Bit Error Rate:	<10 <sup>-9</sup>
single mode fiber ( <i>recommended</i> ):	9 μm
Multimode fiber ( <i>recommended</i> ):	62.5/125 μm
Multimode fiber ( <i>optional</i> ):	100/140, 85/140, 50/125 μm

<b>J/E-PSW-FX-02 (ST)</b>	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

<b>J/E-PSW-FX-02 (SC)</b>	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

<b>J/E-PSW-FX-02 (SM)</b>	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

<b>J/E-PSW-FX-02-100 (SC)*</b>	1310TX/1550RX nm single mode
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

<b>J/E-PSW-FX-02-101 (SC)*</b>	1550TX/1310RX nm single mode
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.

\* Single Fiber, install in pairs.

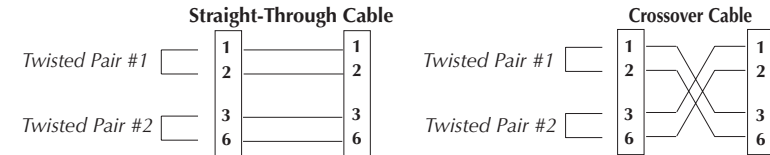
**Copper Cable** Maximum cable distance: 100 meters

<b>Category 3:</b> ( <i>May be used for 10 Mb/s operation</i> )	
Gauge	24 to 22 AWG
Attenuation	11.5 dB/100m @ 5-10 MHz

<b>Category 5:</b> ( <i>required for 100 Mb/s operation</i> )	
Gauge	24 to 22 AWG
Attenuation	22.0 dB /100m @ 100 MHz

- Straight-through (MDI) or crossover (MDI-X) cable may be used.
- Shielded (STP) or unshielded (UTP) twisted-pair 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.

## Cable Specifications -- Continued



## Technical Specifications

For use with Transition Networks Model J/E-PSW-FX-02 or equivalent.

Standards	IEEE 802.3™, IEEE 802.3ab™, 1998
Data Rate:	10 Mb/s, 100 Mb/s
Dimensions	76 x 100 x 25 mm (3 x 3.9 x 1 inches)
Weight	181 g (6 oz.) approximately
Power Consumption:	2.5 W
Power Supply	12 VDC, 0.5 A ( <i>North America</i> ) 12 VDC, 0.41 A ( <i>Europe, Japan, Latin America</i> ) 12 VDC, 1.25 A ( <i>N. Z., Australia, U.K., South Africa</i> ) ( <i>The external power supply provided with this product is UL listed by the power supply's manufacturer.</i> )
Packet Size:	Memory: 48K bytes (384 Kbits) Unicast MAC addresses: 2 K Maximum packet size: 1522 ( <i>if 802.3ac tagged</i> ) 1518 ( <i>not tagged</i> ) bytes
MTBF	50,000 hours ( <i>MIL217F2 V5.0</i> ) ( <i>MIL-HDBK-217F</i> ) 125,000 hours ( <i>Bellcore7 V5.0</i> )
Environment	Tmra*: 0 to 50°C (32 to 122°F) Storage Temp: -20 to 85°C (-4 to 185°F) Humidity: 5 to 95%, non condensing Altitude: 0 to 10,000 feet
Warranty	Lifetime

\*Manufacturer's rated ambient temperature.

The information in this user's guide is subject to change. For the most up-to-date information on the J/E-PSW-FX-02 media converter, view the user's guide on-line at: [www.transition.com](http://www.transition.com).

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

**CAUTION:** Visible and invisible laser radiation when open. Do not stare into the beam or view directly with optical instruments.

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

## 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 Pwr LED illuminated?  
NO
  - Is the power adapter the correct type (*voltage and frequency*) for the AC outlet?
  - Is the power cord properly installed in the media converter and in the outlet?
  - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 YES
  - Proceed to step 2.
  
2. Is the LNK Act (*copper link/activity*) LED illuminated?  
NO
  - Check the copper cables for proper connection and pin assignment.
  - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 YES
  - Proceed to step 3.
  
3. Is the LNK Act (*fiber link/activity*) LED illuminated?  
NO
  - Check the fiber cables for proper connection.
  - Verify that the TX and RX cables are connected to the RX and TX ports, respectively, on the 100Base-FX device.
  - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 YES
  - Proceed to step 4.
  
4. Is the 100 (*copper speed*) LED illuminated?  
NO
  - Check the copper cables for proper connection.
  - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.
 YES
  - On = The media converter has selected 100Mb/s operation.
  - Flashing = The media converter has selected 10Mb/s operation.
  - If the speed is not correct, disconnect and reconnect the copper cable to restart the initialization process.
  - 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](http://www.transition.com) and click the Transition Now link.

### Web-Based Seminars


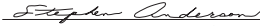
Transition Networks provides seminars via live web-based training. Log onto [www.transition.com](http://www.transition.com) and click the Learning Center link.

### E-Mail

Ask a question anytime by sending an e-mail to our technical support staff. [techsupport@transition.com](mailto: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:	J/E-PSW-FX-02 Series Media Converters
Part Number(s):	J/E-PSW-FX-02(ST), J/E-PSW-FX-02(SC), J/E-PSW-FX-02(SM) J/E-PSW-FX-02-100(SC), J/E-PSW-FX-02-101(SC)
Regulation:	EMC Directive 89/336/EEC
Purpose:	To declare that the <i>J/E-PSW-FX-02</i> to which this declaration refers is in conformity with the following standards.
	CISPR 22:1997+A1:2000; EN 55024:1998+A1:2000 Class A; FCC part 15 subpart B; CFR 21 subpart J
	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	January, 2007 Date

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# Compliance Information

## CISPR22/EN55022 Class A

### 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 Funkstörgranzwertklasse 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.



**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 EG-Mitgliedstaaten 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.



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.

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